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SCHOOL OF ECONOMICS AND MANAGEMENT

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~BACHELOR THESIS~

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## DIGITAL MONSTERS: An empirical analysis of the effect of increasing e-commerce on firms and markets in Sweden

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### **Abstract:**

The aim of this thesis is to develop an understanding of how Swedish retailers selling goods on the consumer market and the competition among them have been affected by the growth of e-commerce between the years 2007-2015. Firm specific data from 133 firms have been used together with market specific data estimated from 6850 firms to analyse why some firms do better than others, and which decisions related to e-commerce that have been favourable during the observable period of time. The performance of firms is measured with the development of their market shares between 2007-2015. The study introduces a new variable to measure when firms started using e-commerce, based on when they first mentioned e-commerce in their annual report. The results imply that early entrants in e-commerce have had an advantage, that large incumbent firms do not have any additional advantages and that old firms are stuck in a path dependence and do not use internet retailing to the same extent as younger firms.

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Keywords: e-commerce, internet- and brick-and-mortar retail, first mover advantage, path dependence, free riding, economies of scope, sequential games, game theory, market share, competition.

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# I. Introduction

During the last couple of decades, the market for many goods has changed dramatically due to the increasing digitalization. One of the main consequences has been the steady growth of e-commerce all around the world that has primarily been driven by improved home computers, the penetration of smartphones and faster broadband that is accessible almost everywhere.

Due to the large growth of e-commerce, many traditional brick-and-mortar retailers have been struggling for some time. Swedish media continuously communicate that firms are having a hard time because of the increasing competition from internet retailers<sup>1</sup>. However, it is difficult to draw conclusions about how much e-commerce can grow and how this will affect firms and different markets in the long run. Today, traditional brick-and-mortar retailers generally also sell their goods on the internet (i.e. use multiple distribution channels to sell their goods), and this is becoming the prevalent practice by firms. Nevertheless, the extent of use by different channels vary among them and it is generally possible to categorize them as brick-and-mortar- or internet retailers.

In this essay, the impact of the decision to enter e-commerce on the performance of retailers selling goods on the consumer market in Sweden will be studied and analysed with the help of the economic theories introduced below. These theories will initially be described and then demonstrated in an e-commerce setting using game theory and sequential games. Correspondingly, hypotheses based on the research questions formulated in section five of this paper will be tested with an empirical study that includes ten different markets and 133 observations. The performance of firms is measured with the development of market shares and the choice of entering e-commerce is evaluated by examining the annual reports of the firms included in the study.

Initially, economic theory on first mover advantage will be used to explore if firms have advantages or disadvantages when entering e-commerce at an early stage. By overlooking several markets in Sweden, it is hard to find any clear indications of why some firms do good and others do worse. Thus, it lies in our interest to understand if firms that enter e-commerce early has an advantage compared to later entrants. Second, path dependence theory will be taken into consideration when analysing why some firms start using e-commerce as a distribution channel at an early stage while some do not. Third, the increasing e-commerce has created the possibility of free riding on the services offered by brick-and-mortar retailers and then buying the good online. This phenomenon is referred to as “showrooming”. There is also conversely the option of using the services provided

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<sup>1</sup> See for example Svenska Dagbladet Näringsliv (2016), Dagens Nyheter Ekonomi (2017) and Dagens Industri (2017).

on a website and then buying the good at a brick-and-mortar retailer. This is referred to as “webrooming”. Free riding also occurs between firms where later entrants in a market can have an advantage since they don’t need to make the same mistakes and unnecessary investments that the first entrant(s) made. The later entrants can imitate the first entrant(s) and the cost of imitating is generally less than the cost of being innovative (Lieberman & Montgomery, 1998). This paper will highlight free riding and will attempt to explain how and in which e-commerce settings it can be of importance.

In conclusion, the aim and main purpose of this thesis is to understand if the theories of first mover advantage, path dependence and free riding are applicable in an e-commerce setting. Furthermore, we will examine how factors deriving from these theories have affected the development of market shares for retailers selling goods in a few defined markets. We will accordingly try to understand if these factors have been critical for retailers during the observable period of time and if they can help explain why some firms fail while some succeed.

The paper is structured as follows: we will initially, in section two, give a brief background of the e-commerce in Sweden. Secondly, in section three, a review of relevant literature will be presented together with a basic theoretical framework of sequential games in section four. The research questions and the corresponding hypotheses are found in section five. The data will be presented in section six and the model specification for the empirical study is presented together with the results in section seven. Lastly, a conclusion and a discussion based on these results are found in section eight and nine.

## II. Background

### II.1. The Development of E-commerce in Sweden

E-commerce has been growing exponentially in Sweden since the financial crisis 2007-2008. The revenue in e-commerce has increased from 17.7 to 57.9 billion SEK between 2007 and 2016 and its share of total revenue in trade has increased from 3 % to 8 % during the same period of time<sup>2</sup>. While e-commerce has been growing, more firms have begun to adapt and have consequently started using internet as a retailing channel (E-barometern, 2017). According to TT news agency (2017), the national wire service in Sweden, recent statistics show that e-commerce grew by 18 % the first quarter 2017 compared to 2016.

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<sup>2</sup> See figure II.1 and II.2 in appendix I.

HUI Research is a company that conduct surveys and collect data on the development of e-commerce in Sweden in cooperation with Postnord and Svensk Digital Handel. The statistics are presented quarterly and compiled in an annual report called E-barometern. According to the report from 2017, the brick-and-mortar retailers share of the market has been declining in a fast pace the last couple of years. Between 2015 and 2016 it decreased from 78 % to 65 % and the total market share of e-commerce increased from 22 % to 35 %. Correspondingly, the same study shows the division of revenue in e-commerce categorized into different lines of business. E-commerce is expected to be more prominent in the lines of business where the revenue is large. In 2016, the largest share of revenue was allocated to home electronics, clothes, shoes, books and media<sup>3</sup>. These lines of business are consequently included in the empirical study of this paper.

During the last couple of years, the growth of e-commerce has not been restricted to Sweden but has taken place all around the world and has predominantly occurred in Asia-Pacific, Europe and North America. According to the Global B2C E-commerce Report (2016), executed by the E-commerce foundation, the total revenue of e-commerce in Europe was 505 billion USD in 2015 and grew by 13 % in both Europe and North America the same year. However, e-commerce was growing faster in Asia-Pacific (28 %), Latin America (28 %) and the Middle East and North Africa (19 %). These regions are catching up and the market for internet retailers can therefore be expected to widen in a fast pace whilst the whole world is starting to use internet as a consumption channel.

In Sweden, people are using the internet and are making purchases online more frequently than people in the rest of Europe. Eurostat (2017) compile statistics on the internet usage and the e-commerce consumption of citizens in the European Economic Area (EEA)<sup>4</sup>. According to the statistics for 2016, only people in the United Kingdom, Denmark, Luxembourg and Norway was using and was shopping more frequently online than the people in Sweden. Accordingly, Sweden is one of the countries in the world with the best access to internet and its citizens tend to shop online more than the average person in the European Economic Area.

Eurostat also compile country-specific statistics on firms' revenue in e-commerce as the share of total revenue. Accordingly, Swedish firms has been getting a larger fraction of revenue from e-commerce than the average country in the European Economic Area between 2007 and 2016.

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<sup>3</sup> See figure II.3 in appendix I.

<sup>4</sup> See figure II.4 in appendix I for statistics of 31 countries in the European Economic Area.

Only firms in Ireland, the Czech Republic, Norway, the United Kingdom and Finland have been getting a larger share of their revenue from e-commerce<sup>5</sup>.

To sum up, Europe is one of the leading regions in the world in e-commerce and Swedish people tend to use the internet and shop online more frequently than the average European. Additionally, Swedish firms get a large fraction of their revenue from e-commerce. This makes it interesting to study Swedish firms to understand how they are affected by the development of e-commerce and why some perform well while some don't.

## II.2. The Swedish Consumer

Among Swedish consumers, 71 % made a purchase on a website at least once a month in 2016 according to the same report by HUI research mentioned in the previous section. The main reasons to choose e-commerce instead of brick-and-mortar retailers are that it is more comfortable and less expensive to shop online or that the products are not available locally.

Internet retailers aren't affected by geographical borders to the same extent as brick-and-mortar retailers. Today it is possible to order most products online from a foreign retailer and delivery times are perceived equally competitive by Swedish consumers. One in three of all the packages that are sent from abroad reach the Swedish consumer in three to five days. This is comparable to the average time of three days that it takes for Swedish firms to deliver goods purchased online. In 2016, 22 % of consumers in Sweden made a purchase from a foreign website at least once a month. The most common purchases were clothes, shoes and home electronics and came from China, the United Kingdom, Germany and the United States (E-barometern, 2017).

Additionally, HUI research has compiled statistics over how widespread the phenomena webrooming and showrooming are since 2013. This was made by asking consumers if they have made research in a physical store or on a website before making a purchase in the other distribution channel. The occurrence of both webrooming and showrooming appear to have been decreasing, the former from 65 % to 24 % and the latter from 24 % to 14 %, between 2013 and 2016<sup>6</sup>.

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<sup>5</sup> See figure II.5 in appendix I with statistics for 19 countries between 2007 – 2016.

<sup>6</sup> See figure II.6 in appendix I for statistics between 2013-2016

### III. Literature Review

In this section, literature on first mover advantage and path dependence is presented since these theories are critical to comprehend to be able to understand the essence of this paper and draw conclusions about the empirical study. Furthermore, the free rider problem is explained because of its presumed impact on firms and markets whereas both firms and consumers can choose to free ride and take advantage of investments and services offered by other firms. Consumer free riding will not be studied empirically but is still touched upon since it is expected to be of great importance in the competition among retailers. Some of the sources used in this section were published before e-commerce existed. However, they are still repeatedly cited and their relevance in an e-commerce setting will accordingly be tested in the empirical study.

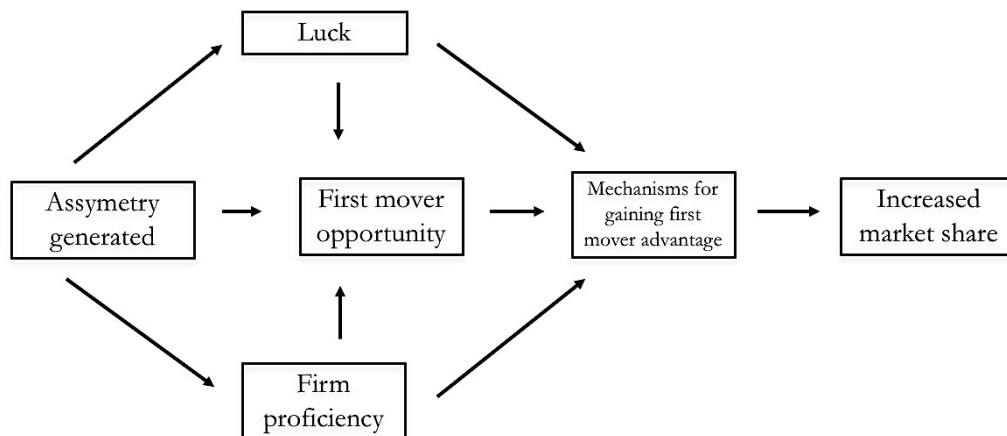
#### III.1. First Mover Advantage

During the first part of the 20<sup>th</sup> century, many firms gained large advantages because they were first at making large investments in a certain industry. Chandler (1990) called these firms “first movers” and they dominated their industries for decades. Back then, the advantage of being first mainly derived from the benefits of economies of scale and scope. In technologically advanced and capital intensive industries large plants can produce products at a lower cost since the marginal cost decline when the volume increase (economies of scale). Similarly, they can sometimes produce a variety of products with the same materials, competences and production processes in the same plant (economies of scope). Concerning the latter, efficiencies can correspondingly be obtained by a broadening of distribution channels. The advantages of the first movers were vast and it was difficult for firms to penetrate markets that were already dominated by another firm. The main tool to compete with these firms has been innovation and strategy. Improving quality, lowering costs and creating new markets has been ways to enter an industry already dominated by one or a few firms. Chandler states that there can be more than one first mover in an industry and that inventors of a product or a process should be distinguished from first movers.

According to Lieberman and Montgomery (1988), first mover advantages arise in a few steps called a “multi-stage process”. The first step consists of some asymmetry being generated that enables one or more firms to gain a head start over competitors in the same market. The head start can be generated by several factors, e.g. that one firm possess some competence that other firms don't or just because of plain luck. This “head start” is synonymous with a first mover opportunity, and

when this has been generated the firm can obtain and retain an advantage with a variety of mechanisms, some of which are mentioned below.

Liebermann and Montgomery (1988) claims that first mover advantages primarily arise from technological leadership, pre-emption of assets and switching costs. Leadership in technology is attained when the cost of production decrease as the firm accumulate more human capital or makes advances in product or process technology. The pre-emption of assets can lead to an advantage when a firm is controlling certain assets (i.e. physical resources, process inputs or positioning in geographic-, product- and shelf space). Switching costs arise when later entrants need to invest extra resources to attract customers away from a first mover. For the consumer, there is correspondingly a cost related to the changing (switching) from the firm already chosen in a specific market since time need to be spent to find another firm offering a homogenous or better product. Also, first movers receive disproportionate amounts of attention and later entrants consequently need to use more resources to create superior products or advertise more frequently. The multi-stage process of the first mover advantage by Lieberman and Montgomery is illustrated in figure III.1.



**Figure III.1.** Illustration of the multi-stage process by Lieberman and Montgomery (1988).

The spatial pre-emption mentioned above is interesting since the internet can be regarded as a market just as geographic regions are considered different markets. Eaton and Lipsey (1979) approach this phenomenon and explains that if firms with a large market share does not establish new capacity to meet the increased demand the competition will increase when the demand increases. This suggest that it is profitable to invest in excess capacity in a market before the demand increase and that firms doing so will later be rewarded. Thus, investing heavily in e-commerce at an early stage can be regarded as spatial pre-emption in a new market. In a more recent paper by Lieberman and Montgomery (1991) this phenomenon is defined as pre-emption in the best marketing and distribution channels.



Yada, Varadarajan and Shankar (2008) discuss whether the perspectives on first mover advantage, developed in a setting without e-commerce, still holds in what they refer to as “the internet enabled market environment (IME)”. They conclude that there are three mechanisms that are of greater importance in e-commerce than in brick-and-mortar retailing. First, building a large network at an early stage is favourable because consumers will then stay since later entrants’ networks are smaller than those already existing. This can be interpreted as early allocations of resources towards e-commerce. Secondly, building switching costs for consumers is of greater importance, thus it is favourable making it costly for consumers to switch to another firm. Since it takes time for consumers to learn how to use a website and to gain confidence in purchasing products online the switching costs are often higher in e-commerce. Lastly, according to the authors, technological leadership and innovations in products, processes, marketing and business models are more advantageous in e-commerce than in brick-and-mortar retailing.

An additional phenomenon that can lead to a first mover advantage is the adoption of a standard technology that increase the switching costs for consumers. Shapiro and Varian (1999) explains that many firms throughout history has gained a dominant position because they have won a “standard battle”. Some examples of such battles are Microsoft vs Netscape, Microsoft Word vs WordPerfect and Matsushita’s VHS vs Sony’s Betamax. Most people recognize the winners from these battles and similarly few people recognize the losers. Today, many websites improve the more a consumer use them and the more they are used by other consumers. The websites recognise the consumer’s preferences with the help of cookies and can help the consumer make optimal choices and this feature accordingly improve the more the consumer use the website. When making purchases it is often possible to read reviews by other consumers and to see which products other similar consumers bought. These are examples of network effects where the value of the website is dependent on the number of consumers using it. Thus, penetrating the e-commerce market at an early stage and gaining a large market share can increase the consumer switching costs, create a standard website and hence lead to a first mover advantage. Accordingly, Shapiro and Varian mention that first movers often are farther down the learning curve and can more easily develop a standard innovation, or in this case a standard website.

Existing literature on the importance of first mover advantage in e-commerce is conflicting. However, empirical work on the effect of first mover advantage in e-commerce preceding the dot-com crash in the beginning of the 21<sup>st</sup> century has been conducted by Lieberman (2005). This work shows that many early entrants overestimated the effects of first mover advantages and underestimated the value of adequate market analysis. First mover advantages existed for early

entrants in environments with network effects and for firms with patented innovations, for other firms the advantages appeared minimal. Additionally, Lieberman argues that first mover advantages did not arise because of low entry barriers, highly imitable business models and low consumer switching costs. However, this study was conducted in the United States at a time when the growth of e-commerce was yet at a relatively low level and the conclusions are not necessarily applicable in a Swedish context today.

### III.2. Path Dependence

Path dependence theory was popularized by Paul A. David (1985) when he questioned the fact that the top row of our keyboards spell QWERTYUIOP even if this isn't the optimal order of letters to be as efficient as possible. The order of letters is a legacy from typewriters and the phenomenon was termed path dependence. It explains how decisions today are limited by decisions made in the past since it is easier and less costly to continue along an already set path. This schoolbook example of path dependence can be applied to old firms not making the transition to e-commerce because they have been focusing on brick-and-mortar retailing for a long time in the past. Ever since the article by Paul A. David, many researchers have used path dependence in different settings to analyse if firms, industries and markets are limited by their history and the decisions made in the past.

Most of the research following the paper by Paul A. David investigates how industries or markets as an entity follows a specific path because of decisions made historically. One of the more prominent researchers in this field is Brian Arthur who in his article "*Competing Technologies, Increasing Returns, and Lock-In by Historical Events*" from 1989 argues that lock-in effects (i.e. getting stuck in one specific path) arise more often in an economy with increasing returns. Under diminishing or constant returns the lock-in effects are not as common and the choices made historically do not decide the forthcoming path in the same extent. This is associated to the cost of large investments made in industries with increasing returns that are sunk when a competing technology arises.

More recent research by Liebowitz and Margolis (2013) suggest three different degrees of path dependence. In the first degree, agents make commitments to specific paths that turn out to be the right ones. In second degree path dependence, the agents make the right choice considering the existing information, yet an asymmetry is generated that can yield higher returns and decisions made historically become disadvantageous. Finally, third-degree path dependence occurs when it is possible for an agent to make the right decision since the necessary information is available, but the wrong decision is made and this leads to an undesirable lock-in effect.

There is no relevant literature to be found on lock-in effects of traditional brick-and-mortar retailers in conjunction with the growth of e-commerce. However, the different degrees of path dependence and lock-in effects are interesting ideas to study and analyse to understand why some firms are more likely to enter e-commerce than others.

### III.3. Free Riding

The concept of free riding is principally found in neoclassical microeconomic theory and is customarily defined as:

“Free riding is based on the notion that whenever it is not (economically) feasible to exclude market participants from using a certain resource, the market for that resource will not produce an optimal result.” (Van Baal and Dach, 2005, pp. 76-77)

Van Baal and Dach (2005) further explains that consumers engage in free riding in retail when they use more than one distribution channel within one transaction to obtain services from one firm and then make the purchase at another. With empirical data, the same authors were able to show that 20 % of customers were free riders in retail. Carlton and Chevalier (2001) states that free riding in retail occurs when it is not feasible to charge an extra fee for some inputs needed to sell a product, e.g. informed personnel, space to display products, advertising, etc. It is then possible for one firm to offer these services and for another firm to offer the same products without these services at a lower price.

Concerning the context of e-commerce, the free rider problem could theoretically occur in either direction. As mentioned in the introduction this is referred to as showrooming when brick-and-mortar retailers are the adversely affected and webrooming when the opposite holds. Carlton and Chevalier (2001) explains that webrooming is not as severe a problem since brick-and-mortar retailers cost of providing services is a variable dependent on the number of customers whereas the cost for internet retailers is primarily fixed.

Lieberman and Montgomery (1998) equally argues that free riding can be considered a “first mover disadvantage”, thus it can distort the advantage gained by a first mover. It is always more expensive being the innovator than the follower because innovation costs are higher than imitation costs. It could therefore be an advantage not being the first mover but instead one of the early entrants (i.e. second mover) in e-commerce. Lieberman and Montgomery (1991) explains that the value for a first mover depends on its ability to predict the technological development and customer needs. Hence, it can be advantageous not being the first mover when the market is characterized by

uncertainty. A firm can benefit of waiting, being one of the early entrants and free ride on the mistakes and investments already made by previous firms. This phenomenon will primarily be referred to as second mover advantage and first mover disadvantage in this paper.

## IV. Theoretical framework

In this section, basic sequential games will be presented and explained. In game theory, a sequential (or dynamic) game consist of a leader and a follower making their decisions at different times. This differs from simultaneous games where all the players make their decision at the same time. Since we differentiate firms in this paper by the time they enter e-commerce and do not expect them to make decisions simultaneously we will use sequential games as a theoretical framework. Circumstances will be simplified and exclusively one period games (i.e. games that are played only once) will be used and the number of players will be limited to two. In the first subsection, the basic Stackelberg model of quantity competition is presented. This is traditionally, as the name implies, a competition model where firms compete by quantity. In this paper, the same approach will be taken theoretically, but the quantity should instead be interpreted as the market share obtained by the first- and second mover.

In the second subsection, some games adapted to an e-commerce setting based on the literature in the previous section are presented. These games are constructed to make it easier for the reader to grasp how first mover advantage, first mover disadvantage, path dependence, economies of scope and free riding by both firms and consumers can occur.

### IV.1. Sequential Games – The Stackelberg Model of Quantity Competition<sup>7</sup>

In the most basic form of the Stackelberg model there are two players, one leader (firm 1) and one follower (firm 2), that are competing by quantity. We assume that the market has the following linear demand function:  $P = A - B(q_1 + q_2)$ , where  $q_1$  is the quantity for the leader firm and  $q_2$  is the quantity for the follower. We also assume that both firms have the same cost  $C$ . Firm 1 know the demand function and make its choice by considering the best response for firm 2. Since we are in a duopoly setting, the best response for firm 2 is calculated by setting the marginal revenue for firm 2 equal the marginal cost. This gives us the following best response for firm 2:  $q_2 = \frac{A-C}{2B} - \frac{q_1}{2}$ , firm 1 can then integrate this function into its profit function (that is simply calculated by multiplying the demand function with the quantity of firm 1). This gives us the following profit

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<sup>7</sup> See for example Pepall, Richards & Norman, 2014, p. 265.

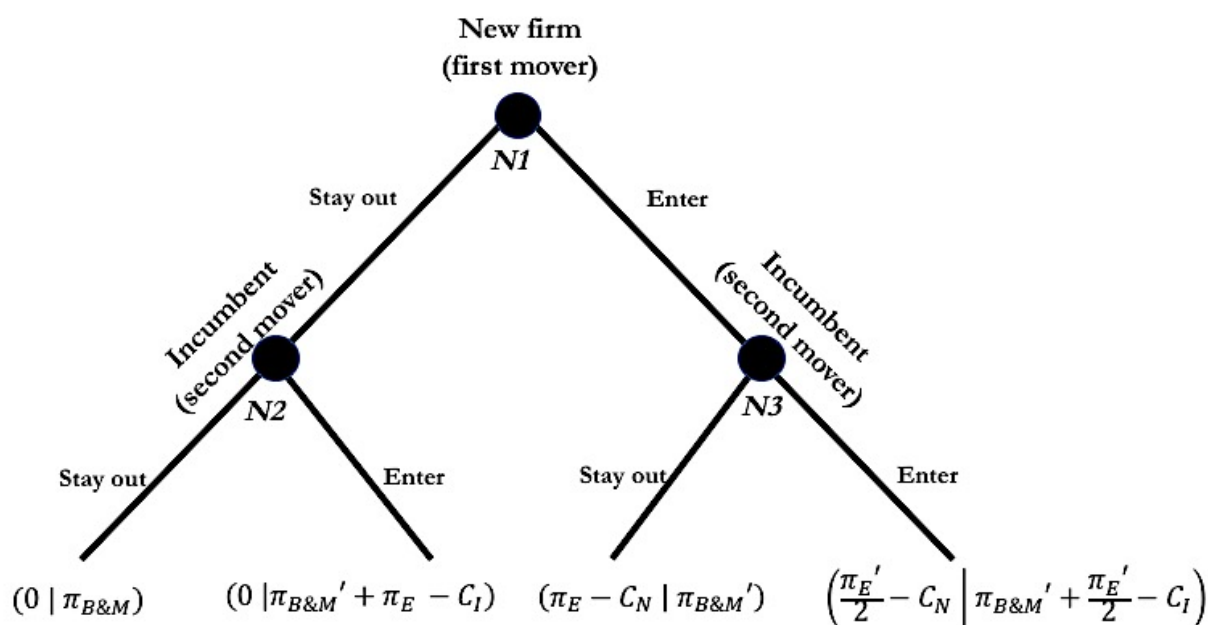
function for firm 1:  $q_1 = \left(\frac{A-C}{2B} - \frac{B}{2}q_1\right)q_1$ . To find the profit-maximizing output for firm 1 we set the marginal revenue (the derivative of the profit function) equal to the marginal cost which is 0 since the cost is  $C$ . We then find that the quantity for firm 1 is:  $q_1 = \left(\frac{A-C}{2B}\right)$ , consequently the best response for firm 2 is:  $q_2 = \left(\frac{A-C}{4B}\right)$ .

Thus, according to the most basic form of the Stackelberg model, that was first published 1934, the leader firm has an advantage in terms of quantity output since  $\left(\frac{A-C}{2B}\right) > \left(\frac{A-C}{4B}\right)$ . This can, as already explained, be interpreted as an advantage in terms of a larger market share for the first mover. When the larger market share has been obtained, the firm can for example keep this advantage by increasing switching costs for consumers and take advantage of network effects. One important aspect of this model is the assumption that the firms are identical in terms of products and costs. Even if this does not reflect the reality very well, the main results of the model can be applied in real life situations and we can therefore expect the leader firm to get a larger share of the market than the follower. Contrariwise, if the firms were instead competing by prices in a sequential game the second mover would have an advantage. However, in this paper we are primarily interested in the theory of first mover advantage and we consequently choose the model of quantity competition. More elaborated models customized to an e-commerce setting are presented in the next section.

## IV.2. Sequential Games in an E-commerce Setting

In figure IV.1 on the next page, a sequential game with a new firm and an incumbent firm is illustrated in extensive form. With this game, it is possible to describe under what circumstances firms will enter e-commerce and analyse the consequences of the outcomes with the help of the literature presented in section three. Since e-commerce has been growing steadily for a long period of time we can expect firms entering e-commerce to have an advantage in terms of an increased market share. In the game depicted on the following page, the new firm is the first mover whereas the incumbent firm is the second mover and is already making a profit in brick-and-mortar retailing ( $\pi_{B\&M}$ ). This game is solved with backward induction starting at the second or third node ( $N2$ ,  $N3$ ). These nodes correspond to the choice for the incumbent firm of entering or staying out of e-commerce. The game is solved by eliminating choices that will not be made and the most profitable of those remaining for the new firm will be the subgame perfect equilibrium, the Nash equilibrium in each subgame and consequently the outcome of the game.

Starting with the branch to the left, the payoff for the incumbent firm if both firms choose to stay out of e-commerce will be  $(\pi_{B\&M})$  and the payoff for the new firm will be 0. If the incumbent firm enters and the new firm choose to stay out, the payoff for the incumbent will be the brick-and-mortar revenue and the whole revenue from e-commerce minus the cost that the incumbent undertakes when entering e-commerce  $(\pi_{B\&M}' + \pi_E - C_I)$ <sup>8</sup>. Accordingly, since the new firm stays out the payoff will be 0. If the new firm enters and the incumbent choose to stay out, the payoff for the new firm will be the whole revenue from e-commerce minus the cost of entering for the new firm  $(\pi_E - C_N)$ . The payoff for the incumbent firm will then be  $(\pi_{B\&M}')$ , a smaller payoff than without the competition from e-commerce. If both firms choose to enter, the payoff for the new firm will be the shared revenue from e-commerce minus the cost of entering  $(\frac{\pi_E'}{2} - C_N)$ , where  $(\pi_E' < \pi_E)$  due to the competition in e-commerce. Consequently, the payoff for the incumbent firm will be  $(\pi_{B\&M}' + \frac{\pi_E'}{2} - C_I)$ . We simplify the games by not further analysing the prevailing form of competition since it will not make any additional contribution to these models. Hence, these games are not based on the Stackelberg model of quantity competition and we therefor do not assume that the market share for the first mover is greater than for the second mover. If the assumption of a Stackelberg setting where to be made the games would be complicated but simultaneously the notion of a first mover advantage would be strengthened.



**Figure IV.1.** The extensive form of the game between a new and an incumbent firm (or first mover and second mover).

<sup>8</sup> The firm lose some revenue in brick and mortar retailing due to the competition (or cannibalization) from its own e-commerce channel and we have the following condition:  $(\pi_{B\&M}' < \pi_{B\&M})$ .

### *First mover (dis)advantage and path dependence*

In the two following games, the same outcome will be reached with two distinctive assumptions considering the cost of entering e-commerce. These will after a brief presentation be interpreted separately. A short summary of the outcomes and interpretations of the games in this section is to be found on the following page. In all games, we assume that old incumbent firms that has been focusing on brick-and-mortar retailing for a long time will not act aggressively as a way of pre-empting new and younger firms from entering. We assume that the cost of entering e-commerce ( $C$ ) is identical for both firms ( $C_N = C_I$ ) or lower for the new firm ( $C_N < C_I$ ). Thus, we have the following condition: ( $C_N \leq C_I$ ). The cost for both firms is greater than the shared profit when both firms enter e-commerce but less than the profit when only one firm enters:  $\left(\frac{\pi_{E'}}{2} < C < \pi_E\right)$ . With the assumptions made, the games can easily be solved with backward induction starting in  $N2$ . The incumbent firm will choose to stay out since  $\left(\frac{\pi_{E'}}{2} - C_I < 0\right)$  hence  $\left(\pi_{B\&M}' > \pi_{B\&M}' + \frac{\pi_{E'}}{2} - C_I\right)$ . The new firm will enter since  $\left(\pi_E - C_N > 0\right)$ . Accordingly, with the assumptions made, *(enter, stay out)* is the only subgame perfect equilibrium and a Nash equilibrium in each subgame. Two interpretations of this result are presented briefly in the next two paragraphs.

Firstly, when the cost is the same for both firms ( $C_N = C_I$ ) the old incumbent firm will not enter since the new firm enters first. The shared revenue is less than the cost of entering and the incumbent firm is consequently stuck in brick-and-mortar retailing. Accordingly, the first mover will have an advantage since it will be the only firm in e-commerce. Thus, if e-commerce grows faster than brick-and-mortar retailing, the market share of the firm that has entered e-commerce at an early stage will increase. We know from literature that there is empirical evidence of firms gaining advantages because they were among the early entrants in a market. However, when taking the theory of path dependence into consideration, we do not expect firms that have existed for a very long time to be among those early entrants. The emergence of e-commerce and its exponential growth can be regarded as an asymmetry not expected by old incumbent firms. These firms already made a choice of investing largely in brick-and-mortar retailing and we assume that they will continue to do so due to their historical decisions.

Secondly, when assuming the cost for the new firm to be less than for the incumbent ( $C_N < C_I$ ) the outcome of the game is identical. However, the intuitive reason why is not the same. The incumbent firm stays out since the cost of entering after the first mover is greater. From literature, we know that first mover advantage in e-commerce can derive from switching costs that occur

when a lot of consumers start using a certain website at an early stage. These switching costs can increase the cost of entering e-commerce for the second mover.

Finally, in the last game of this subsection, we assume that the cost for the first mover is greater than for the second mover whose cost of entering e-commerce follow the same assumptions as in previous analysis: ( $C_N > C_I$ ). The cost for the second mover is assumed to be lower since they have more time to make adequate market analysis and can free ride on the mistakes and successful investments made by firms exogenously (i.e. outside this model). The cost of entering e-commerce for the second mover is correspondingly lower than the shared profit when both firms enter e-commerce, thus: ( $C_I < \frac{\pi_{E'}}{2}$ ). However, since the cost for the new firm is still the same as before, we know that ( $C_N > \frac{\pi_{E'}}{2}$ ). Hence, we know that the second mover will always make the choice of entering e-commerce and the first mover will consequently choose to stay out since ( $\frac{\pi_{E'}}{2} - C_N < 0$ ). The only subgame perfect equilibrium and Nash equilibrium in each subgame is therefor (*stay out, enter*). In section III.3 we explained that imitation costs are lower than innovation costs. Even though the second mover is the first firm to enter e-commerce in this game, the lower cost should be considered an advantage that derive from waiting and entering later which makes it possible to free ride on the decisions and successful investments made by other firms exogenously.

In conclusion, we have the following results and interpretations of the games described above where the new firm is the first mover and the incumbent is the second mover:

*Scenario 1 ( $C_N = C_I$ ): The new firm will enter and the incumbent will stay out. In this scenario, we have an explanation of when first mover advantage can arise and correspondingly when path dependence can be occurring.*

*Scenario 2 ( $C_N < C_I$ ): The new firm will enter and the incumbent will stay out since the incumbent have higher costs due to the switching costs that arise when another firm enter a market at an early stage.*

*Scenario 3 ( $C_N > C_I$ ): When assuming the cost of entering to be lower for the second mover due to the possibility to free ride on the mistakes and decisions by early entrants, the second mover will be the only firm entering. Thus, this scenario explains under what circumstances free riding among firms can occur.*

#### *Economies of scope*

Lastly, if we change the assumptions a little bit, we can explain why incumbent firms can have advantages compared to new firms with the help of the same game illustrated in figure IV.1. Even though we expect old firms to have some form of disadvantages due to path dependence, there is a possibility that those that are large have an advantage in terms of economies of scope. When entering e-commerce, we can assume that large well known incumbent firms with a large amount

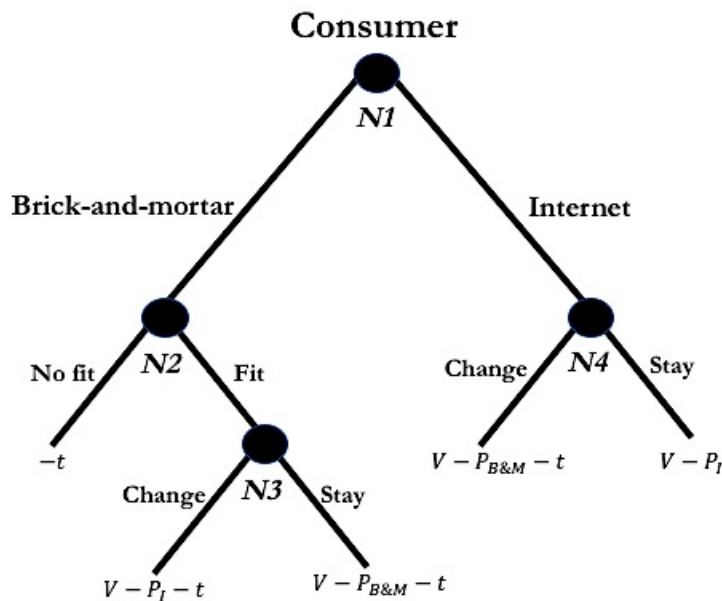


of tied capital have an advantage compared to smaller firms. These advantages can for example derive from using already available inventory and from firm specific knowledge about the market when starting selling goods through a new distribution channel. Conversely, we can assume that the smaller firm need to make larger investments in building an inventory, recruiting and educating staff, advertising and analysing the market. Consequently, if the large incumbent firm takes advantage of economies of scope, the cost of entering e-commerce for the new firm will be greater than for the incumbent. In this game, we assume that the cost for the new firm  $C_N$  is greater than the cost for the incumbent  $C_I$ , thus we have the following condition: ( $C_N > C_I$ ). Moreover, unlike previous analysis, we assume that the payoff for the new firm will always be positive if it enters e-commerce: ( $\pi_E - C_N > 0$ ) and ( $\frac{\pi_{E'}}{2} - C_N > 0$ ). From our assumptions, we know that ( $\frac{\pi_{E'}}{2} - C_I > \frac{\pi_{E'}}{2} - C_N$ ) since ( $C_N > C_I$ ). We also know that the payoff of entering e-commerce will always be positive for both firms since the payoff for the new firm is always greater than 0. We can draw the conclusion that both firms will enter since the following holds: ( $\pi_E - C_N > 0$ ), ( $\frac{\pi_{E'}}{2} - C_N > 0$ ) and ( $\pi_{B\&M}' + \frac{\pi_{E'}}{2} - C_I > \pi_{B\&M}'$ ), thus the only subgame perfect equilibrium is (*enter, enter*). Both firms have an incentive to enter e-commerce, however there is a difference in the cost structure for the firms and the payoff from e-commerce will be greater for the incumbent than for the new firm. The market share in e-commerce will be the same for the firms after the first period (bearing in mind that this game is limited to one period). The advantage of getting a larger payoff for the incumbent can in later periods be transformed into a larger market share since it is possible to make larger investments in e-commerce. If this game reflects the reality, we can expect some of the large firms to have an advantage compared to new firms. Additionally, it is probable that those defined as large incumbent firms in this study have become large due to a first mover advantage in brick-and-mortar retailing and that this advantage is retained in e-commerce.

#### *Consumer free riding*

We will now turn to the consumer side and try to explain why some consumers choose to shop at brick-and-mortar retailers and some decide to do their shopping on the internet. We will also be able to theoretically explain when consumers choose to free ride in both possible directions (i.e. showrooming and webrooming). The following game have been constructed with inspiration from a pricing game by Xin (2007), but some simplifications and modifications have been made to be able to relate it to e-commerce. The utility for a consumer for a specific good is denoted by  $V$  and we assume the utility to be a constant for a certain good. The shopping cost (i.e. searching for the good with the right characteristics, transport costs, etc.) is denoted by  $t$ , the price at a brick-and-

mortar retailer is  $P_{B\&M}$  and at an internet retailer  $P_I$ . There is always a risk that a consumer visit a brick-and-mortar retailer and do not find any good, then the consumer only acquires the shopping cost ( $-t$ ). When finding a good that fits the consumer's preferences, the consumer has the choice to stay or change to the other retailer. We assume that the shopping cost for a good at a brick-and mortar retailer is  $t$ , but that the same cost for a good on the internet approaches zero:  $(\lim_{t \rightarrow 0} V - P_I - t)$ . Thus, we assume the shopping cost in internet retailing to be absent in this game. Although this isn't a very realistic assumption, the searching costs are getting lower and lower whilst the internet is getting faster, deliveries are getting more convenient for consumers and searching tools are getting more developed and user friendly.



**Figure IV.2.** The free riding pricing game where the consumer know the cost of searching for a good.

The pricing game is illustrated in figure IV.2 above. Starting at  $N3$ , with the assumptions made, the consumer will buy the good at the brick-and-mortar retailer when  $(V - P_{B\&M} - t > V - P_I - t) \rightarrow (P_I > P_{B\&M})$ , the same consumer will change to the internet retailer and free ride on the service offered by the brick-and-mortar retailer when the opposite holds:  $(V - P_I - t > V - P_{B\&M} - t) \rightarrow (P_{B\&M} > P_I)$  (showrooming). This means that only the price matters when the consumer decides whether to buy the good in the brick-and-mortar retailers shop or to free ride and buy the good on the internet retailers website.

Moving on to  $N4$  in figure IV.2, the consumer have the choice of staying or changing to a brick-and-mortar retailer when finding a good on the internet. In this setting the following must hold for the consumer to stay and make the purchase at the internet retailer:  $(V - P_I > V - P_{B\&M} - t)$ , consequently the following must hold  $(t > P_I - P_{B\&M})$ . Thus, the difference in price between the

internet retailer and the brick-and-mortar retailer must be smaller than the cost of searching for the good, this is always true when the price at the internet retailer is lower. Accordingly, if the shopping cost is large the consumer will choose to make the purchase at the internet retailer. However, if the shopping costs are small and the price at the brick-and-mortar retailer is lower than the price at the internet retailer, the consumer will free ride on the service provided by the internet retailer (webrooming).

In the last game, we do not take the type of good into consideration, only the shopping cost and the difference in price between retailers. Since most goods today are possible to sell on the internet we expect the shopping cost and the price to be important factors for consumers when deciding where to do the purchase. Webrooming is expected to be of greater importance when the price at the brick-and-mortar retailer is lower and the shopping costs related to the purchase are low. The shopping costs can for example be reduced when the service from a brick-and-mortar retailer during and after the purchase are highly valued and the same service is not available at the internet retailer. Showrooming is expected to be more common when the price on the internet is lower. In this example, showrooming will occur when prices on the internet are lower than in the brick-and-mortar shop. However, as stated before, shopping costs in e-commerce are assumed to be absent in this example. If they weren't, lower shopping costs in e-commerce would increase the presence of showrooming and higher shopping costs would increase webrooming.

As argued by Carlton and Chevalier (2001), free riding is a more severe problem for brick-and-mortar retailers in terms of costs. Thus, brick-and-mortar retailers are expected to be affected negatively by the free rider problem and internet retailers aren't expected to be affected to the same extent. An empirical study on how firms are affected by consumer free riding goes beyond the scope of this paper, but it is important to understand and recognize the effect that reduced shopping costs in internet retailing and consumers' decisions can have on the competition among firms. The assumption about the shopping costs to be absent in e-commerce fortifies the implication of showrooming to be of greater importance, yet it is important to remember that shopping costs also exist in e-commerce and can occasionally be higher than in brick-and-mortar retailing (e.g. when delivery times are very long and/or costly).

## V. Purpose and Research Questions

As former sections have enlightened, e-commerce and the number of firms starting to use internet as a distribution channel is steadily growing. Thus, the purpose of this paper is to understand under what circumstances retailers selling goods on the consumer market decide to enter e-commerce and inquire what consequences this can have for them. This is done in the context of Swedish firms that are registered as joint-stock-companies (i.e. aktiebolag) in the period 2000-2015. With the availability of annual reports on these firms since 2000 and the possibility to export firm specific data on revenue since 2007 it is feasible to make an empirical study examining the effect on market shares by different proxies associated to e-commerce and relating this to the literature in this paper.

Given the purpose of this study and the available data, we test the following research questions:

- 1. Did first movers have an advantage whereas second movers and large incumbent firms had an additional advantage in terms of an increased market share during the observable period?*
- 2. Are older firms less likely to engage in e-commerce than younger firms?*

In response to the research questions, the following two hypotheses have been formulated:

- H.1: Early entrants in e-commerce, primarily those defined as second movers, have gained a larger absolute and relative market share than late entrants between 2007 -2015.*
- H.2: Large incumbent firms have had an additional advantage when entering e-commerce early and have increased their market share more between 2007-2015 than those defined as small firms.*
- H.3: Older firms are caught in a path dependence and has not used internet as a distribution channel at the same extent as younger firms between 2000-2015.*

## VI. Data

This section presents the data that has been used to realise the empirical study and how it was collected. Adjustments of the data, definitions of proxies and limitations will be explained together with some clarifications of the procedure of the empirical study.

### VI.1. Description of Data and Variables

This paper is based on secondary data found in the database Retriever Business (earlier Bolagsinfo). This is a database with key figures for all public firms in Sweden that furthermore grants access to all annual reports between 2000 and 2015. To be able to define different markets affected by e-commerce the advanced search function has been used to find all the joint-stock-companies in a specific line of business. Those lines of business are correspondingly the defined markets used to

calculate market shares for all firms included in this study. The statistics from E-barometern (2017) presented in section two concerning the division of revenue in e-commerce in different lines of business have been taken into consideration when defining the markets to be sure that e-commerce is prevalent. Exclusively retailers, and not manufacturers, in ten different lines of business have been included in the study<sup>9</sup>. The option of exporting firm specific data from the database to a spreadsheet program made it possible to include a total of 6850 firms. The large number of firms in the defined markets made it feasible to calculate the market shares of all the firms in their respective line of business. The market shares of the firms in 2007, 2009 and 2015 have been calculated and the difference between these years, in absolute and relative numbers, for selected firms have been used as dependent variables in the empirical study.

For the empirical study, a selection of firms in each line of business have been made. The selection criteria to enter the study is that the firm must have had an average market share of 1 % or more ( $s_i \geq 0.01$ ) for the years 2007, 2009 and 2015. In line of business 7 and 8 (see appendix II) the condition ( $s_i \geq 0.008$ ) was used instead because of a low number of observations. The average market share was used instead of the market share in the beginning or the end of the period to avoid excluding firms that have been doing comparatively good or bad. This method of selection led to a total of 133 observations, a list of the observations and some of the important variables used in the study are found in table VI.2 in appendix II. The observant reader may notice that the dependent variables described before are missing for some observations. This has been taken into consideration and the data set has been adjusted in some regressions by not including all the observations.

To measure when firms started using internet as a distribution channel the annual reports between 2000 – 2015 for all the observations have been reviewed. The proxy used as a measurement for when firms started using internet as a distribution channel is the year that the firms first mentioned e-commerce in the annual report<sup>10</sup>. This was in the grand majority of cases found in the management report where a firm is supposed to present important conditions and significant events during the fiscal year. Since the end of the period was 2015, the variable *firstmention* was calculated as the difference between 2015 and the year that the firm first mentioned e-commerce (e.g. if a firm first mentioned e-commerce in 2000, *firstmention* would assume the value 15). To be able to separate between firms that mentioned e-commerce in another context than as a distribution channel a binary control variable called *mentionselling* was created. With this variable, it

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<sup>9</sup> See table VI.1 in Appendix II for all the lines of business, total number of firms and total revenue.

<sup>10</sup> See for example Bolagsverket (2013).

is possible to create an additional variable by multiplying it with *firstmention*, we call this variable *firstmentionselling*. There are only three firms that mentioned e-commerce in another context than as a distribution channel. Accordingly, only the variable *firstmentionselling* is used in the empirical study and additional regressions with the variable *firstmention* are left out.

To be able to compare firms that have been registered in the database for different number of years a variable named *firstmention/firstannual* was created. This is the ratio between the variable *firstmentionselling* described above and the difference between 2015 and the year that the first annual was registered. This variable will for example assume the value  $\frac{2}{3}$  for a firm that first mentioned e-commerce in 2005 and have been registered since 2000 (since  $\frac{10}{15} = \frac{2}{3}$ ) and consequently 1 for a firm that first mentioned e-commerce 2010 and has been registered since that same year. This variable can be interpreted as the importance of e-commerce for the firm during the observable period. However, when using the whole dataset, it is critical to not draw any strict conclusions when using this variable since it can assume the same value for firms that are very different.

To study differences between old and new firms a variable called *age* was created. This is the difference between 2015 and the year that the firm was formed. For example, if a firm was formed in 1985 *age* would assume the value 30. This variable can be used to analyse if the age of a firm affect the choice of using internet as a distribution channel.

Furthermore, the variable *large\_incumbent* was created to test if firms that were large in the beginning of the period have had an additional advantage when entering e-commerce early due to economies of scope. The variable assumes the value 1 if the firm had a market share of 4 % or more ( $S_i > 0.04$ ) in 2007 and otherwise 0. This condition was made to include firms from all markets that have been using e-commerce for a long time. A total of 33 firms are defined as large incumbent firms and 100 firms had a market share of less than 4 % in 2007.

The dependent variables used in this study are the growth of the market share (*growth\_si*) between 2007-2015, the absolute difference in market share (*diff\_si*) between the same years and the variable *firstmention/firstannual*. The correlation coefficient between the two first mentioned variables is 0.23 with outliers and 0.62 when outliers are excluded. The high correlation between the variables without outliers is normal since they are both based on the same data. The third dependent variable is computed with different data and is therefore not as strongly correlated with the other dependent variables (0.34 with *diff\_si* and 0.22 with *growth\_si*). Table VI.3 on the next page present the means, the standard deviation and the minimum and maximum values for the dependent variables with and without outliers and the same statistics for the independent variables. As can be seen in the

table, these numbers are largely affected by the choice of removing the outliers that are defined in the next two paragraphs of this section.

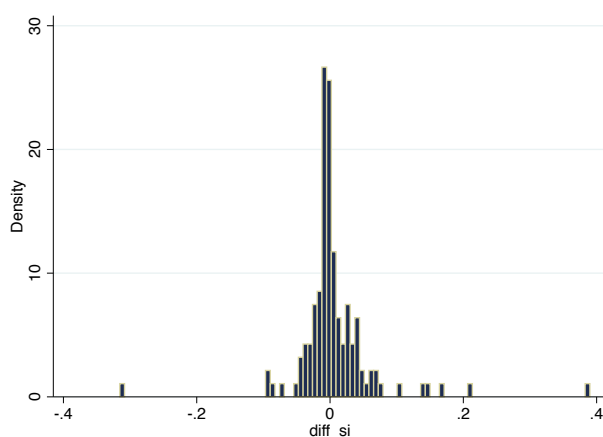
**Table VI.3.** Summary statistics of dependent and independent variables

Variable	Outliers	Obs.	Mean	Std. Dev	Min	Max
<b>diff_si</b>	YES	133	6 %	0.06	- 31 %	38 %
<b>diff_si</b>	NO	130	3.9 %	0.038	- 9 %	17 %
<b>growth_si</b>	YES	121	503 %	25.64	- 100 %	19450 %
<b>growth_si</b>	NO	111	- 9.8 %	0.84	- 100 %	479 %
<b>fm/fa*</b>	-	133	0.28	0.38	0	1
<b>fmselling*</b>	-	133	3.25	4.64	0	15
<b>age</b>	-	133	26.34	19.08	3	110
<b>large_inc*</b>	-	133	0.46	0.5	0	1

Note: Dependent variables in **bold**. \* *fm/fa* = *firstmention/firstannual*, *fmselling* = *firstmentionselling*, *large\_inc* = *large\_incumbent*

As mentioned above, the dependent variable *diff\_si* is the absolute difference in market share for firms between 2007 and 2015, the distribution of the variable for all 133 observations is found in figure VI.1 below. This variable can be used to see if there are any significant differences among firms entering e-commerce at an early stage and those entering later in the absolute change in market share. Additionally, it is possible to examine if there are any differences between first and second movers by studying scatterplots. As a robustness check we do the same tests and adjust the data by identifying outliers. These are identified by observing the histogram and removing the observations that deviate markedly from other observations in the sample. In this data set, the observations with a difference in market share greater and less than 20 % are removed, thus we have the following condition:  $(0.2 > diff\_S_i > 0.2)$ .

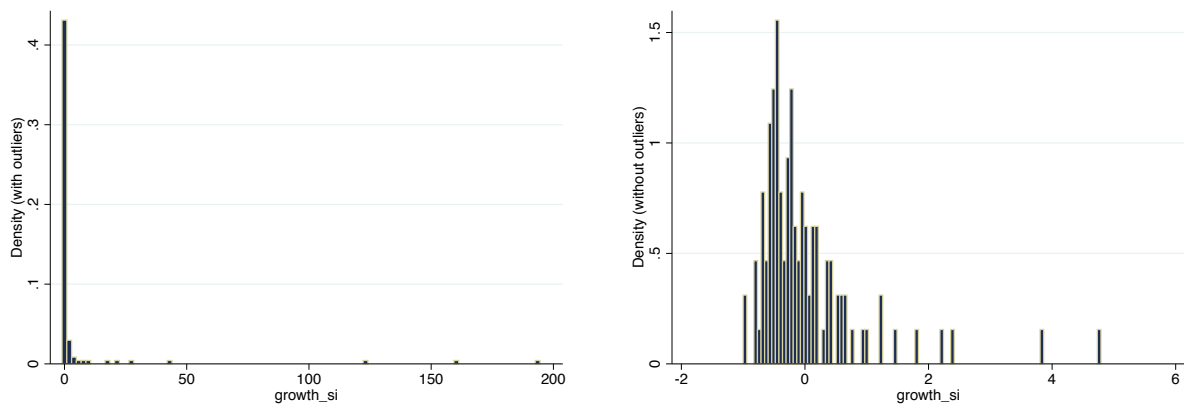
**Figure VI.1.** Distribution of the absolute difference in market share 2007-2015.



The second dependent variable is the growth in market share between 2007 and 2015 calculated with the following formula:  $\left(\frac{diff\_S_i}{S_i 2007}\right)$ . This variable was created to adjust for the difference in the change in market share for firms that was small or large in the beginning of the period. For example, the absolute change in market share for a firm that increased its market share from 1 % to 2 % would be the same as for a firm that increased its market share from 80 % to 81 %, whereby the

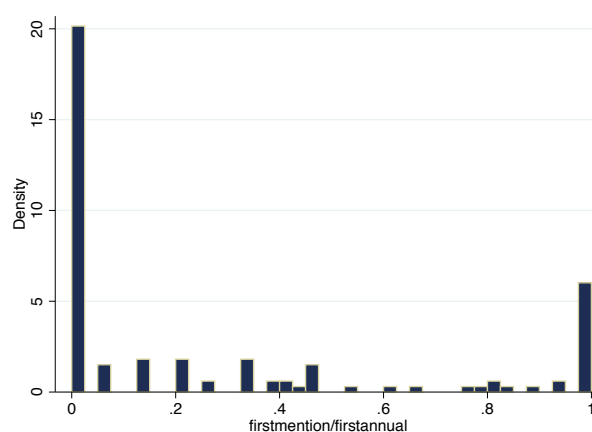
relative growth for the former would be 100 % and for the latter 1,25 %. The distribution of this variable is found in figure VI.2 and it is in this case more important to adjust the data by identifying outliers when using it. Outliers have been identified with the following condition: ( $Growth_{S_i} < 5$ ), thus firms with a growth of the market share greater than 500 percent are excluded. However, all the regressions are run with and without outliers and a subjective identification of them is solely made as a robustness check to see if they significantly influence the result. In figure VI.2 it is easier to get a clear image of the distribution of the variable in the histogram without outliers (to the right) since the scale on the x-axis is minimized due to the very large value on  $growth_{si}$  for some observations.

**Figure VI.2.** Distribution of the growth in market share 2007-2015 (with and without outliers).



To be able to examine if the age of the firm influence its choice of using internet as a distribution channel we need an additional dependent variable. In this case,  $firstmention/firstannual$  will be used since it is the only variable that can be interpreted as the importance of e-commerce for the firm. The distribution of this variable for the whole data set is found in figure VI.3. As explained above, this variable is problematic since two firms that are very different can get the same value. To deal with this problem a separate regression with only firms registered during the whole period (i.e. between 2000 – 2015) will be run. Accordingly, separate regressions with different data sets will be run when using the other dependent variables as well.

**Figure VI.3.** Distribution of the variable  $firstmention/firstannual$ .





## VI.2. Data Limitations

There are some flaws in the data set and they will be presented to assure that the reader is familiar with them and keeps them in mind before drawing conclusions about the results.

Firstly, the categorisation of the data is made by the database Business Retriever and despite controls there are no guarantees that all the firms are categorized in the right line of business. Correspondingly, the data set is limited to business to consumer (B2C) retailers. This excludes all the firms that are categorized as business to business (B2B) retailers even if they also sell their goods on the consumer market. To make the data set manageable the decision was made to solely include joint-stock-companies in the study which leads to an exclusion of many firms that are registered in another type of business entity. However, the most common business entity in Sweden is the joint-stock-company and this choice is not expected to affect the final results.

Secondly, as revealed in section II.2, many consumers buy goods from foreign firms when making purchases online. Thus, the markets that are affected by e-commerce do not have any geographical borders compared to other markets. This paper only includes Swedish firms, although better results would be obtained by further widening the market.

Third, e-commerce in its present form has existed since the end of the 20<sup>th</sup> century, however the database limit the observable annual reports to the period 2000-2015. Nevertheless, the total revenue in e-commerce was still at a low level in 2000 and didn't take off until after the financial crisis 2007-2008. Furthermore, before 2000 there were many high-tech firms entering e-commerce at an early stage that went through liquidation after the dot-com crash. Consequently, using data after this episode can be argued to be an advantage. If earlier data would have been used the results regarding market shares could be misleading. Nevertheless, one consequence of this limitation is that the firms defined as first movers are not really first movers. These firms should instead be interpreted as first movers during the observable timespan.

Similarly, the data on revenue for firms included in this study is limited to the years 2007-2015. For previous years, it is not possible to export data on revenues from the database. However, as already stated, the growth of total revenue in e-commerce did not take off until after this year. Thus, this is not expected to affect the results in any significant way. Although, it is still important to recognize these limitations before drawing conclusions about the results.

Lastly, there are no rules stating that firms need to convey which distribution channels they use in the annual report. Accordingly, if a firm is using internet as a distribution channel there is a possibility that this is not stated in the report. Besides, there is also a difference in details in the reports between large and small firms. However, as stated before, a firm is supposed to present important conditions and significant events during the fiscal year. Consequently, we expect firms to state that they have entered e-commerce or have used internet as a distribution channel when it is considered important or to be a significant event.

## VII. Model Specification and Results

A basic ordinary least square (OLS) method is used to examine the research questions and test the hypotheses presented in section five. In this section, the linear regression models are specified and the results are presented. These models are kept as simple as possible to avoid the problem of multicollinearity since the variables used are in many cases correlated.

### VII.1. Hypothesis 1 –First mover (dis)advantage

In this hypothesis, we initially want to examine if there are any implications of a first mover advantage by running the following linear regression models:

$$\begin{aligned} diff\_si &= \beta_0 + \beta_1 firstmentionselling + \varepsilon \\ growth\_si &= \beta_0 + \beta_1 firstmentionselling + \varepsilon \end{aligned}$$

These are run with and without outliers to see if there are any significant relationship between the variables. Correspondingly, the regressions will also be run when only including the observations that have been registered in the database during the whole period (2000-2015). Thus, a total of eight regressions are used to see if there is any relationship between the variables. If first movers, or firms entering early in e-commerce, have an advantage compared to those entering late, the coefficient for *firstmentionselling* need to be positive. The regression will primarily test if entering early or late have a significant impact on the development of the market share with the following null- and alternative hypothesis:

$$\begin{aligned} H_0: \beta_1 &= 0 \\ H_1: \beta_1 &\neq 0 \end{aligned}$$

The results from the OLS estimations of the regressions related to hypothesis 1 are found table VII.1 below. As mentioned above, separate regressions have been run including all variables and

solely including those registered in the database during the whole period. Additionally, regressions when adjusting for the outliers defined in section six has been run.

**Table VII.1.** OLS estimates for hypothesis 1.

Dep. variable	Selection	Coef. ( $\beta_1$ )	P-value	Obs.	R-square
<i>diff_si</i>	All	0.0016 (0.0011)	0.11	133	0.015
<i>diff_si</i>	Whole period	0.0011 (0.001)	0.29	87	0.013
<i>diff_si</i> *	All*	<b>0.0019</b> (0.00065)	0.005	130	0.059
<i>diff_si</i> *	Whole period*	<b>0.0013</b> (0.0006)	0.027	85	0.057
<i>growth_si</i>	All	0.7 (0.48)	0.152	121	0.017
<i>growth_si</i>	Whole period	0.028 (0.07)	0.684	87	0.002
<i>growth_si</i> *	All*	<b>0.067</b> (0.016)	0.000	111	0.14
<i>growth_si</i> *	Whole period*	<b>0.057</b> (0.018)	0.002	84	0.11

Note: Standard errors are in parentheses next to the coefficients of the variables. Significant results are in **bold**.

\* = Outliers are excluded.

None of the significant results equal zero and the null hypothesis can be rejected. Furthermore, the results show that there is a positive correlation between both the absolute and the relative growth in market share with the variable *firstmentionselling*. When including the outliers, none of the regressions are statistically significant at the 5 % level. However, when adjusting for outliers, all the coefficients are significant and indicate a positive relationship between the variables of interest. We can consequently, when adjusting for outliers, draw the conclusion that the firms in this study that mentioned e-commerce at an early stage have had a greater absolute and relative increase in market share than other firms between 2007-2015.

The results indicate that firms that started using internet as a distribution channel at an early point in time have had an advantage measured as an increased market share. Since the variable *firstmentionselling* is used as a proxy for when firms started using e-commerce as a distribution channel, the results can be interpreted as a first mover advantage. In earlier sections of this paper we have showed that internet retailing has been growing faster than brick-and-mortar retailing during the observable period. Accordingly, with respect to the literature on first mover advantage, we expected that a head start in e-commerce could increase the firms market share.

To analyse if there are any implications of a second mover advantage, we will examine if there are any signs of an advantage for firms mentioning e-commerce after those that mentioned it first (i.e. those that have been using e-commerce since 2000 or earlier). This is tested by observing scatterplots of the variables *growth\_si* and *firstmentionselling* together with *diff\_si* and *firstmentionselling* without the defined outliers. The expected shape of the scatterplots for the hypothesis to be true is demonstrated in figure VII.1 on the following page together with the scatterplots of the variables

in figure VII.2 further down. They do not need to look exactly like the illustration in figure VII.1 but ought to have a similar shape.

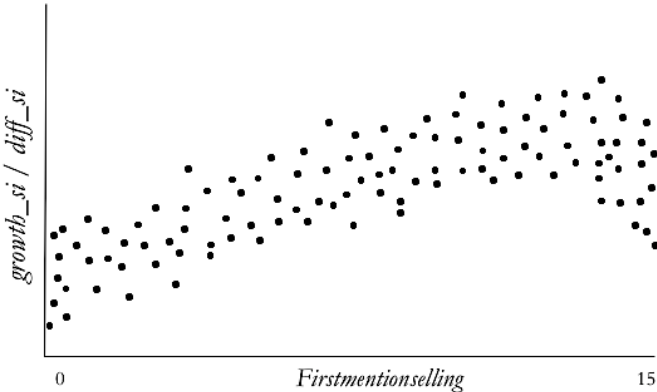


Figure VII.1. Illustration of the expected shape of the scatterplot in order for hypothesis 1 to be true.

The correlation between the first time a firm mentioned internet as a distribution channel and the absolute and relative growth in market share is illustrated by the trend lines in figure VII.2. Although there are some observations that was not first movers that has gained a larger market share, we can't observe any clear indications of a second mover advantage and free riding of firms entering later. Nevertheless, there is nothing in the results that contradicts the hypothesis and it is correspondingly probable that it is advantageous not being the first mover. As can be seen in the scatterplots, there are some firms that has increased their market shares considerably that entered e-commerce later than the first entrants. It is probable that these firms have been free riding on those defined as first movers. However, the results are characterized by incertitude due to the low number of observations and limited time span. We will therefore avoid drawing any conclusions.

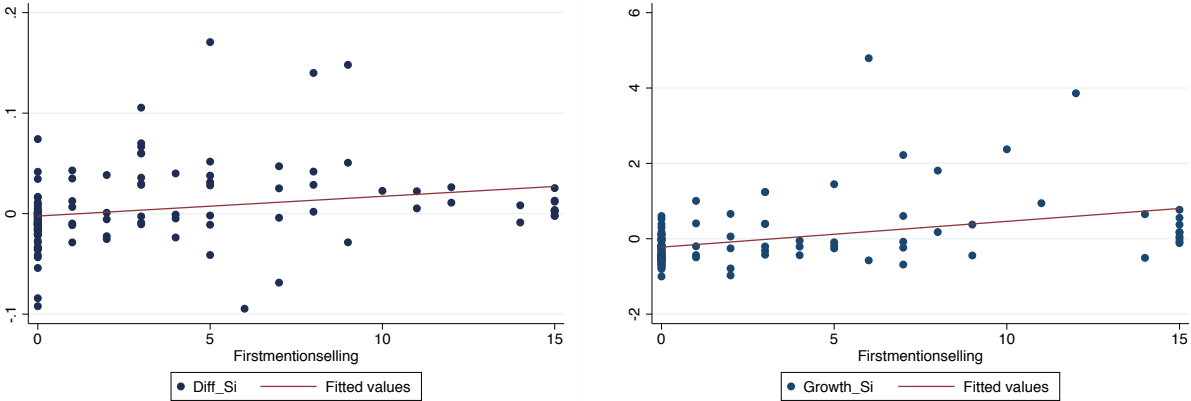


Figure VII.2. Scatterplots of variables *growth\_si/diff\_si* and *firstmentionselling* without outliers.

VII.2. Hypothesis 2 – Economies of scope

This section will examine if there are any implications of an additional first mover advantage in terms of an increased market share for firms defined as large incumbent firms. Firstly, the linear

regression models below have been run to examine if the size of a firm have had an impact on the development of the market share between 2007-2015.

$$diff\_si = \beta_0 + \beta_1 large\_incumbent + \varepsilon$$

$$growth\_si = \beta_0 + \beta_1 large\_incumbent + \varepsilon$$

We test if the development of market shares for large incumbent firms have differed significantly from other firms with the following null hypothesis:

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

The results are ordered as in the previous regression and are presented in table VII.2 below. In this case, additional regressions that exclude observations that has not been registered in the database during the whole period have not been run.

**Table VII.2.** OLS estimates for hypothesis 2.

Dep. variable	Coef. ( $\beta_1$ )	P-value	Obs.	R-square
<i>diff_si</i>	<b>-0.026 (0.012)</b>	<b>0.033</b>	133	0.034
<i>diff_si</i> *	<b>-0.019 (0.007)</b>	<b>0.013</b>	130	0.0048
<i>growth_si</i>	-6.77 (5.22)	0.197	121	0.014
<i>growth_si</i> *	0.16 (0.18)	0.361	111	0.0077

Note: Standard errors are in parentheses next to the coefficients of the variables. Significant results are in **bold**.

\* = Outliers are excluded.

As before, the significant results are separated from zero and the null hypothesis can be rejected. However, none of the results are significant when using *growth\_si* as a dependent variable. The results imply that there has been a negative correlation between the absolute growth in market share and firm size and between 2007-2015 since the coefficients are negative. Unlike previous expectations we can contrariwise expect large incumbent firms to have a disadvantage compared to smaller firms when entering e-commerce at an early stage. However, to find out if this is the case regarding growth in absolute and relative market share we use the following regression model:

$$diff\_si = \beta_0 + \beta_1 firstmentionselling + \beta_2 large\_incumbent + \varepsilon$$

$$growth\_si = \beta_0 + \beta_1 firstmentionselling + \beta_2 large\_incumbent + \varepsilon$$

The same selection of variables as in the regression in section VII.1 has been made and the results should be interpreted in the same way. If first movers, or firms entering early in e-commerce, have had an advantage compared to those entering late, the coefficient for *firstmentionselling* need to be positive and the results need to be significant at the 5 % level. If large incumbent firms have had an additional advantage both coefficients in the regression need to be positive and the result need to be significant. We initially test if being a first mover and a large incumbent firm have had an

impact on the development of market shares between 2007-2015 with the following null- and alternative hypothesis:

$$H_0: \beta_1 = 0, \beta_2 = 0$$

$$H_1: \beta_1 \neq 0, \beta_2 \neq 0$$

The results from the OLS estimations of the regressions related to hypothesis 1 and 2 are found in table VII.3 on the following page. Different regressions have been run when including all variables and when solely including those registered in the database during the whole period. Additionally, regressions when adjusting for the outliers defined in section six has been run. All the significant results are separated from zero and the null hypothesis can consequently be rejected. The results accordingly show that mentioning e-commerce at an early stage and starting off with a large market share in 2007 have had an impact on the development of the market shares between 2007-2015.

As in previous subsection, the results show that there is a positive correlation between both the absolute and relative growth in market share with the variable *firstmentionselling* ( $\beta_1$ ). When including the outliers, none of the regressions are statistically significant at the 5 % level. However, when adjusting for outliers, all the results are significant and indicate a positive relationship between the variables of interest. Like mentioned earlier, these results imply that firms that mentioned e-commerce at an early point in time have had an advantage measured as an increased market share.

As expected from previous regressions, the results suggest that large incumbent firms do not have an additional advantage in terms of an absolute increase in market share. In the OLS estimates in table VII.3 the coefficient for *large\_incumbent* ( $\beta_2$ ) is negative in six out of eight regressions and three out of these are significant at the 5 % level. Thus, almost half of the results concerning the variable *large\_incumbent* are significant at the 5 % level and all corresponding coefficients are negative. According to this data set, large incumbent firms do not seem to have had an advantage in terms of growth in absolute or relative market share between 2007 and 2015. None of the regressions with the relative growth in market share as a dependent variable are significant at the 5 % level. Nevertheless, since most of the coefficients are negative and a three of them are significant there do not appear to have been an additional advantage for large incumbent firms to enter e-commerce at an early stage.

In conclusion, the results suggest that firms entering e-commerce at an early stage have an advantage, but those defined as large incumbent firms do not have an additional advantage in terms of an increased market share.

**Table VII.3. OLS estimates for hypothesis 1 & 2.**

Dependent variable	Selection	Coefficient ( $\beta_1$ )	P-value	Coefficient ( $\beta_2$ )	P-value	Obs.	R-square
<i>diff_si</i>	All	0.0019 (0.0001)	0.094	<b>-0.028</b> (0.01)	<b>0.02</b>	133	0.054
<i>diff_si</i>	Whole period	0.0012 (0.0001)	0.24	-0.017 (0.012)	0.16	87	0.033
<i>diff_si</i> *	All*	<b>0.002 (0.0068)</b>	<b>0.002</b>	<b>-0.02</b> (0.007)	<b>0.004</b>	130	0.12
<i>diff_si</i> *	Whole period*	<b>0.0014 (0.0006)</b>	<b>0.02</b>	<b>-0.014</b> (0.007)	<b>0.049</b>	85	0.09
<i>growth_si</i>	All	0.78 (0.48)	0.109	-7.77 (5.22)	0.139	121	0.035
<i>growth_si</i>	Whole period	0.036 (0.07)	0.608	-0.54 (0.81)	0.503	87	0.007
<i>growth_si</i> *	All*	<b>0.067 (0.016)</b>	<b>0.000</b>	0.052 (0.16)	0.753	111	0.15
<i>growth_si</i> *	Whole period*	<b>0.05 (0.018)</b>	<b>0.002</b>	0.1 (0.21)	0.627	84	0.12

Note: Standard errors are in parentheses underneath the coefficients of the variables. Significant results are in bold.  
 \* = Outliers are excluded

### VII.3. Hypothesis 3 – Path dependence

The hypothesis tested in this section is that older firms are caught in a path dependence and do not focus as much on e-commerce as younger firms. This is the only regression model where *firstmention/firstannual* is used as a dependent variable since the development of market shares is not of interest. The linear regression model is defined as follows:

$$firstmention/firstannual = \beta_0 + \beta_1 age + \varepsilon$$

The regression is run two times, once with all the observations and once exclusively with the observations that have been registered in the database the whole period (2000-2015). For the results to imply that older firms enter e-commerce less frequently and do not focus as much on e-commerce the coefficient for the variable *age* need to be negative. As in earlier sections, we initially test if the age of the firm has an impact on the ratio between the first time a firm mentioned internet as a distribution channel and the first annual registered in the database with the following hypotheses:

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

The results of the regressions are found in table VII.4 below and they are ordered as in previous tables.

**Table VII.4.** OLS estimates for hypothesis 3.

Dep. variable	Selection	Coef. ( $\beta_1$ )	P-value	Obs	R-square
<i>firstmention/firstannual</i>	All	<b>-0.0054</b> (0.0017)	0.002	133	0.073
<i>firstmention/firstannual</i>	Whole period	-0.0036 (0.002)	0.073	87	0.037

Note: Standard errors are in parentheses next to the coefficients of the variables. Significant results are in **bold**.

First, the null hypothesis can be rejected since both coefficients are separated from zero and the first one that includes all observations is significant at the 5 % level. Additionally, the results show that the coefficients for the variable *age* are negative in both regressions. This suggest that older firms tend to concentrate less on e-commerce than younger firms. Accordingly, the results imply that there is a tendency of path dependence when firms make choices to enter e-commerce. The choices made in the past seem to play a large role when firms decide about future strategies. There is a positive correlation with a value on the correlation coefficient of 0.1 between the variables *large\_incumbent* and *age*. Even if the correlation isn't very strong it indicates that older firms tend to be larger than younger firms. Consequently, it appears that it has been an advantage being a small and relatively new firm between 2007-2015. Large incumbent firms that has been around for a long



time have had a disadvantage in the development of the market share and do not appear to have been using internet as a distribution channel to the same extent as small and new firms.

To summarize, the results presented in this section show that there are implications of a first mover advantage and it appears that older firms are stuck in a path dependence. Correspondingly, large incumbent firms do not seem to have an additional advantage in terms of an increased market share compared to smaller firms. Moreover, there are no clear signs that firms free riding on first movers have a second mover advantage in the scatterplots presented in subsection VII.1. In the results with *growth\_si* as a dependent variable the coefficients are always smaller when adjusting the data for outliers, this mean that the OLS estimates that includes the outliers are upward biased. This was expected since the mean of the variable change considerably in table VI.3 when adjusting for outliers. The similar does not hold for *diff\_si* where the mean does not change very much when making the same adjustments.

## VIII. Conclusion

The aim of this thesis is to understand how e-commerce has affected the market share for retailers on the consumer market and why some have been doing good while some have been doing worse between the years 2007-2015. There is limited empirical work to be found on what firm specific traits and decisions that have been favourable when the economy have been getting more digitized and e-commerce has been growing. Thus, with the help of some economic theories this paper empirically studies the impact of e-commerce on firms and markets with secondary data primarily based on choices made by firms. It turns out that some of the theories chosen to analyse e-commerce in this thesis are applicable on retailers selling goods on the Swedish consumer market.

The empirical data consist of 133 observations selected according to certain criteria from a selection of 6850 firms. The condition for making conclusions about the results is that the results need to be significant at the 5 % level and that the signs of the coefficients are consistent for the significant results in each hypothesis. No conclusions are made regarding the values of the coefficients due to their large spread when adjusting for outliers and the low number of observations. Hence, only the signs of the coefficients are of interest in this paper.

Firstly, this paper has been able to show that there are implications of a first mover advantage in e-commerce. The development and growth of e-commerce the last couple of years can be regarded as an asymmetry being generated that create a window of opportunity that enable firms to gain a head start over competitors in the same market. It can be concluded that firms defined as early

entrants in e-commerce has gained a larger market share than those defined as late entrants in section VII.1, but no conclusions can be drawn about the reasons why. Perhaps they were just lucky or maybe they rapidly gained the upper hand by acquiring important knowledge about the market. It is likewise probable that customers get used to certain internet retailers and that their websites become the “standard websites” as described by Shapiro and Varian (1999). The consumer switching costs can accordingly quickly increase and strengthen the first mover advantage when the customers get familiar with a certain internet retailer. Moreover, the results suggest that the Stackelberg model of quantity competition can be applied in an e-commerce setting. It is possible that late entrant does not have the incentives to invest as much in e-commerce as the first mover since the first mover already obtained a large market share. Accordingly, it is plausible that the first two games constructed in section IV.2 concerning first mover advantage, where the assumptions were ( $C_N = C_I$ ) and ( $C_N < C_I$ ), reflects the reality to some extent.

Secondly, according to the test of a second mover advantage there do not appear to be any significant implications of an advantage for firms entering after the first movers. However, no conclusions can be drawn about this hypothesis since the test is subjective and the results will always be biased. Consequently, the question remains if second movers have an advantage or not. Furthermore, as explained in section VI.3, the firms defined as first movers in this study are not really first movers since e-commerce has existed since the end of the 20<sup>th</sup> century. This implies that the early entrants should not be considered early entrants and should perhaps conversely be defined as late entrants. This will be further discussed the next section.

Moreover, this paper has shown that large incumbent firms did not have an additional first mover advantage in terms of an absolute increase in market share. According to the hypothesis, large incumbent firms were expected to have an advantage since they have a lot of available capital that can be employed in an additional distribution channel (economies of scope). Moreover, as mentioned in section III.2, large firms have the capacity to invest large amounts of capital in e-commerce to pre-empt rivals from entering. However, our results conversely show that they have a disadvantage compared to those defined as smaller firms and accordingly the game related to economies of scope in section IV.2 do not seem to get any empirical support.

The results also show that younger firms tend to enter e-commerce and use internet as a distribution channel to a larger degree than older firms. This can be interpreted as path dependence where older firms do not make the transition to e-commerce at the same extent as younger firms because of the decision to invest in brick-and-mortar retailing in the past. The old firms presumably

made the right choice considering the available information in the past, but an asymmetry in the form of e-commerce has been generated and historical decisions has now become disadvantageous. Thus, before the emergence of e-commerce these old incumbent firms were stuck in first degree path dependence, as described by Liebowitz and Argolis (2013), and made commitments to a specific path that turned out to be the right one. However, after the emergence of e-commerce, they have been displaced to second degree path dependence and the historical decisions of investing a lot of capital and effort in brick-and-mortar retailing has become disadvantageous. Furthermore, the first game constructed in section IV.2 where the assumption ( $C_N = C_I$ ) was made seem to be applicable in an e-commerce context where both first mover advantage and path dependence seem to be present.

In summary, the market for the firms included in this study appear to be changing profoundly as young firms are gaining larger market shares while old and large incumbent firms are having trouble adapting to the digitalization and the growth of e-commerce. Taking the plunge into e-commerce at an early stage has its advantages and firms that have not yet adapted should according to the results in this study adopt a strategy for internet retailing as fast as possible. Given the results, it appears that all the sequential games constructed in section IV.2, except for the last one related to economies of scope, can be applied in an e-commerce context. Even though there are no significant results implying that second movers have an additional advantage, it can't be concluded that this isn't the case since nothing contradicts the hypothesis.

## IX. Discussion

This study shows that it is favourable to enter e-commerce at an early stage in order to be competitive in some markets. The competition on these markets appear to be changing since market shares are affected by firms' decisions to enter or not to enter e-commerce. Large incumbent firms do not seem to have had an advantage whilst internet retailing have been increasing. Instead smaller firms, entering e-commerce at an early stage, have been growing fast. This should consequently be good for the competition under the premise that market shares for firms are getting more evenly distributed and that the value for the Herfindahl-Hirschmann Index (HHI)<sup>11</sup> correspondingly is decreasing. For future research, the direct impact of e-commerce on the competition measured as the HHI would be interesting to study. For example, the development of the HHI for some markets where e-commerce is prevalent could be compared to a few markets where e-commerce does not exist or is not as common. It is possible to calculate the HHI for

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<sup>11</sup> The HHI is a commonly accepted measure of market concentration calculated with the following formula:  $\sum_{i=1}^N S_i^2$ .

several predefined markets by using the database Retriever Business and by following the method to collect data used in this study.

The results presented previously are interesting since they show how firms and markets are affected by firms' choices related to e-commerce. Initially, the ambition was to control for the different markets included with market specific dummy variables. Unfortunately, the number of observations in each defined market was too low to yield any results and this was left out of the paper. It is important to bear in mind that all markets behave differently depending on the size of the firms and the market. Hence, the results in this paper can't be generalized to all markets, but can act as guidance for future research. To be able to draw conclusions about specific markets a similar study could be conducted on only one or a few defined markets. Yearly data on market shares could be used between 2007-2015 (including additional years if data is available) for a larger number of firms in one or maximum a few specific markets to study how they relate to the growth of e-commerce.

One surprising finding was that the literature on second mover advantage (or first mover disadvantage) presented in section III.3 is inconsistent with the results in this study. Even if some firms entering after those defined as first movers have increased their market share considerably, there are no convincing signs of an additional advantage for firms defined as early entrants or second movers that could theoretically free ride on the first movers. However, as mentioned in the previous section, it is important to bear in mind that e-commerce existed before the beginning of the period used in this study. Accordingly, there is a risk that some of the bad performing firms that where the "real" first movers have been excluded from the data set. Consequently, there is a possibility that firms defined as first movers in this study have been making adequate market analyses and have been free riding on the mistakes made by the real first movers. Thus, maybe the firms that have been defined as first movers should have been defined as second movers that only incurred imitation costs since the real first movers paved the way. Accordingly, the firms defined as second movers or early entrants in this study should perhaps instead have been defined as late entrants. Hence, it is probable that these firms incorrectly have been expected to have a second mover advantage. When adopting the approach used in this study it is unfortunately not possible to extend the observable period of time. However, as described in section two, internet retailing started to grow at a fast pace after 2000 and the results in this paper are therefore still of interest. To increase the reliability and to be able to draw strict reliable conclusions about the results it would be interesting to conduct a similar study with a more refined test of second mover advantage that includes a larger number of markets and observations over a longer time span.

Another intriguing result in this study was that large incumbent firms do not appear to have an additional first mover advantage compared to smaller firms. Historically, large incumbent firms have had an advantage due to economies of scale and scope. In this paper, large incumbent firms were expected to have an advantage in e-commerce since they for example already have the capital needed to enter e-commerce and firm specific knowledge about the market. This hypothesis was moreover theoretically presented in a sequential game in section VI.2. However, it appears the old rules of first mover advantage described by Chandler (1990) are not applicable in an e-commerce setting. E-commerce should therefore be regarded as a new market that create the opportunity for new first movers to grow. However, the reader should be aware that even though the results can be interpreted as a first mover disadvantage for large firms in an e-commerce context, they possibly merely show a negative correlation between growth in market share and firm size. This difficulty in the interpretation of the results was correspondingly mentioned in section VII.2.

As explained earlier in this paper, it was not possible to empirically test the occurrence of consumer free riding in this study. However, it is known from literature that this is a problem of greater importance for brick-and-mortar retailers (showrooming). Firms mainly using e-commerce as a distribution channel are also victims of free riding (webrooming), although they do not incur the same costs as brick-and-mortar retailers. This is possibly one of the explanations not covered empirically in this study to why firms entering e-commerce at an early stage have had an advantage compared to later entrants. For future research, it would be interesting to empirically test if there has been a difference in the development of markets that are considered more and less affected by showrooming. Even if the prevalence of showrooming has been decreasing since 2013 (see section II.2) it has been important in the past and has presumably affected some markets. The study could be conducted by constructing an empirical comparative study between markets (e.g. the clothing/shoes market and the market for groceries) to see if some variables measuring the cost structure of firms have been developing differently over time. This could favourably be combined with a survey among consumers and firms to find out where showrooming is prevalent.

Lastly, this study is to some extent innovative considering it is not based on previous studies. Hence, the theoretical framework together with the empirical study has mainly been developed ad hoc. Given that there are no previous studies conducted with the same approach there are surely many improvements that can be made. However, e-commerce is an interesting field to study and can favourably be analysed with already existing economic theories and models. This thesis hopefully encourages the reader to take an interest in the field and maybe to engage in a similar study in the future with a more refined method.

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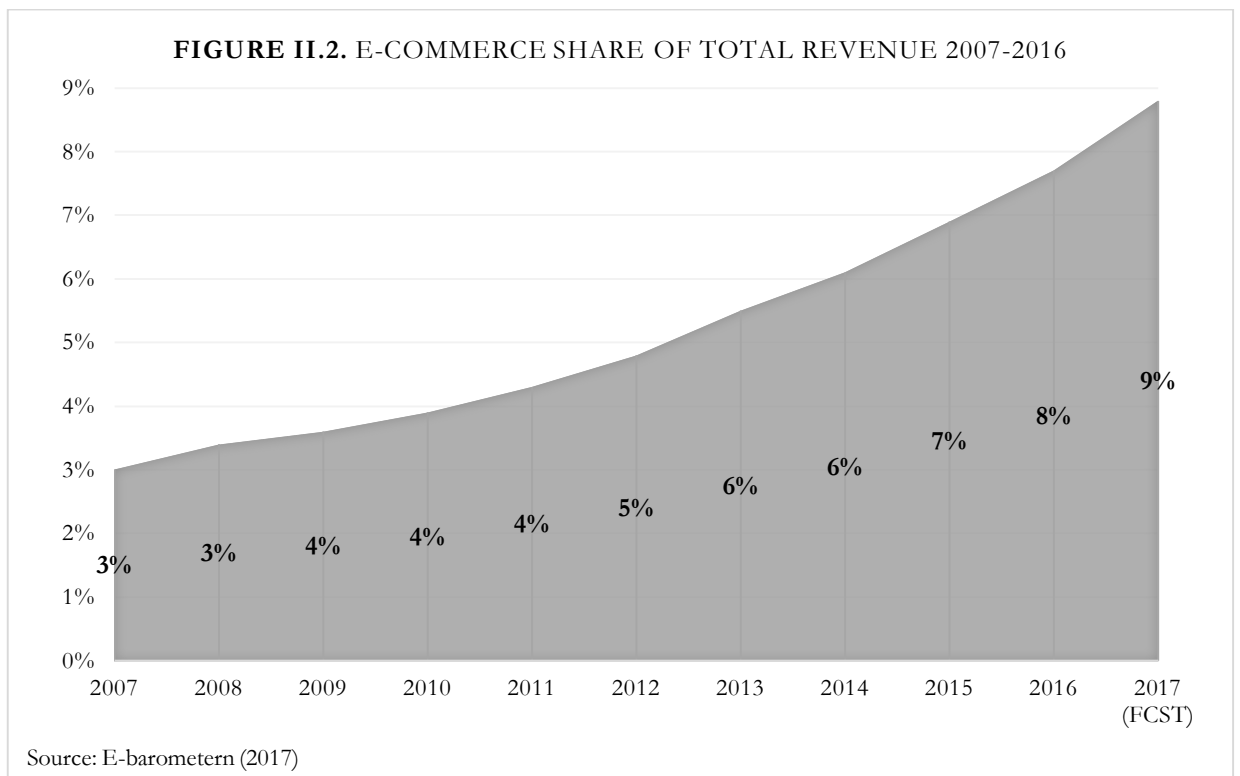
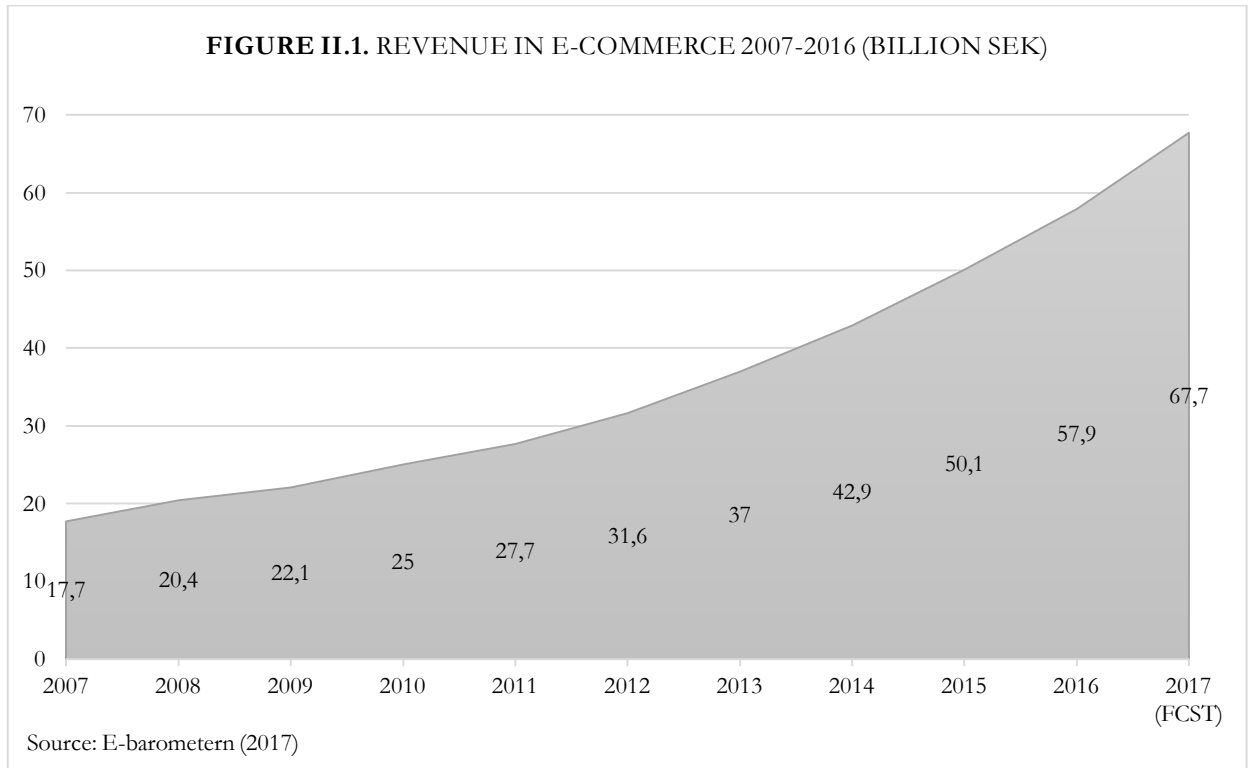
Dagens Nyheter Ekonomi. (2017) *E-handel pressar priser på varor*. Dagens Nyheter, 21 January [Online] Available at: <http://www.dn.se/ekonomi/e-handeln-pressar-priser-pa-varor>, [Accessed 20 Mars 2017].

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TT. (2017) *E-handeln ökar med 18 procent*, 18 May [Online] Available at: <http://tt.omni.se/5efaa38ecbc99ce2c0ba57fbe8380003e3abe421>, [Accessed 18 May 2017].

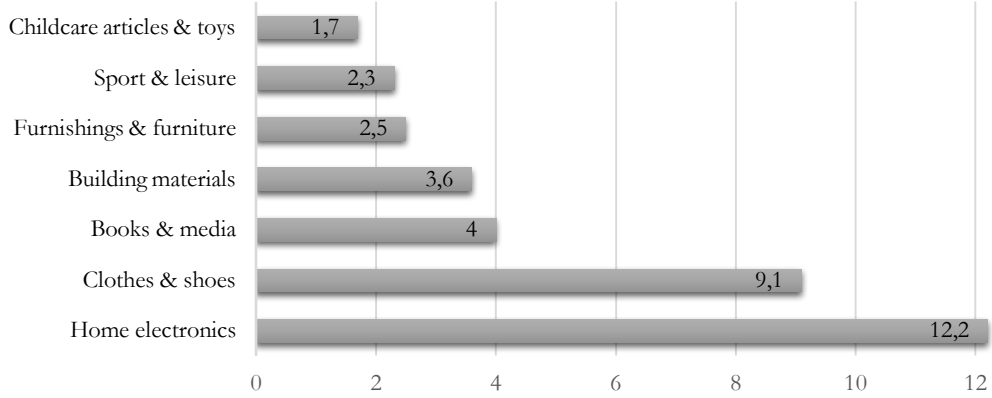
# Appendix

## Appendix I. E-commerce in Sweden



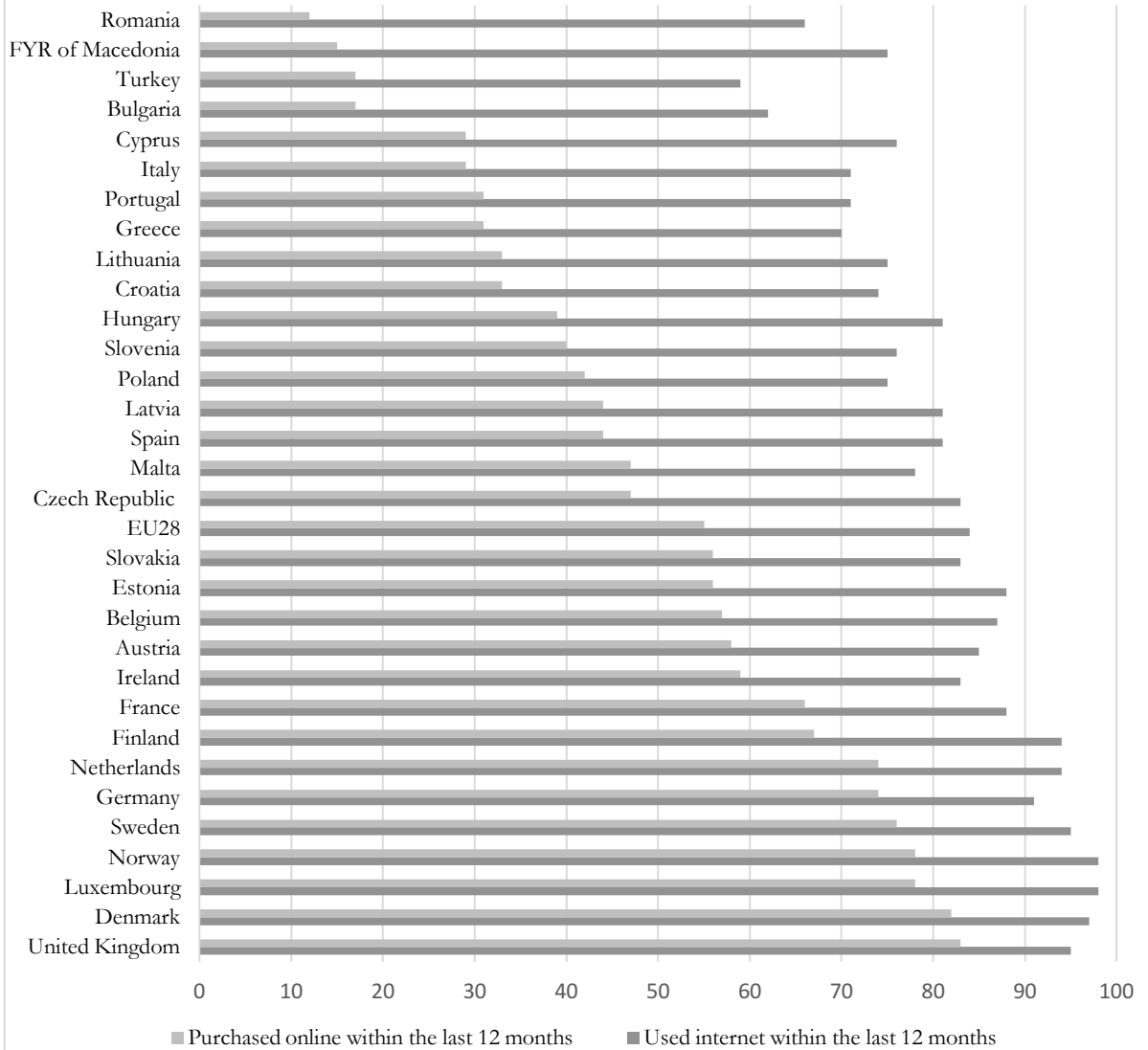


**FIGURE II.3. REVENUE BY LINE OF BUSINESS 2016 (BILLION SEK)**



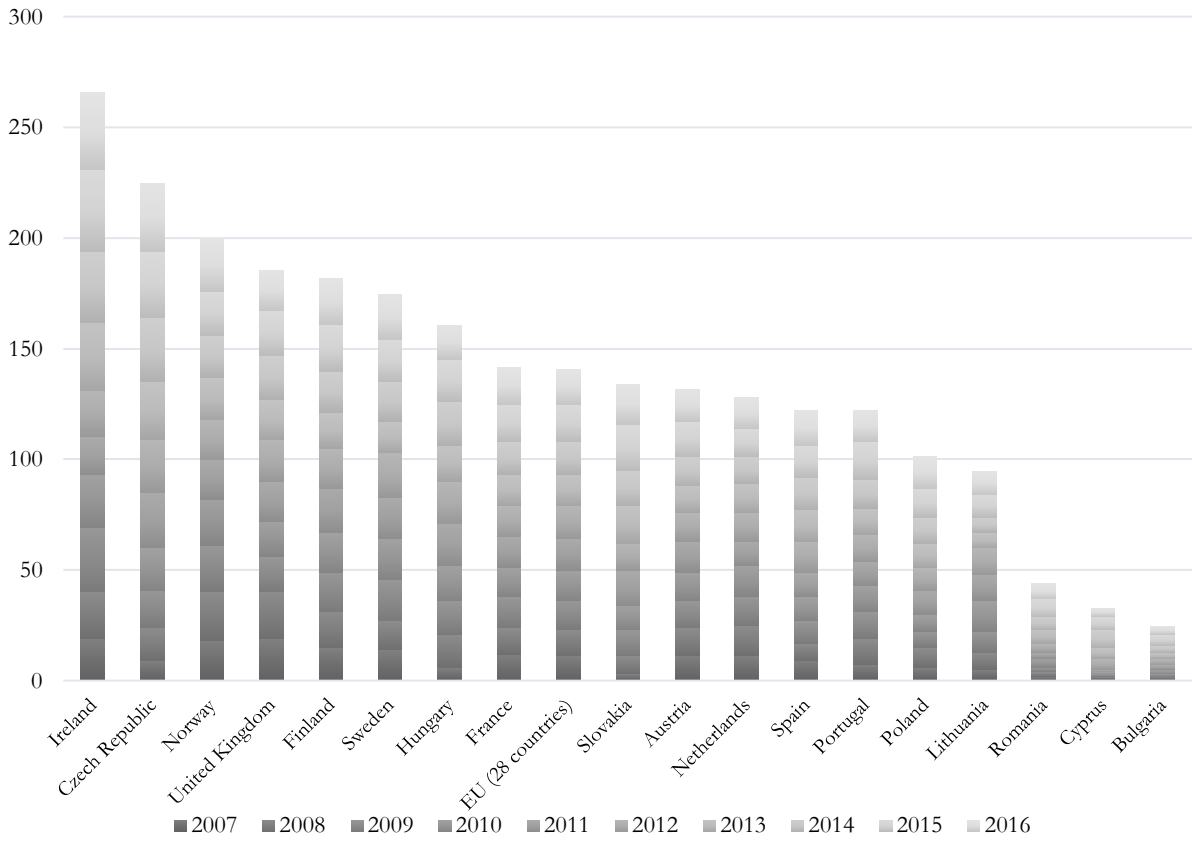
Source: E-barometern (2017)

**FIGURE II.4. INTERNET USE AND ONLINE PURCHASES 2016 (% OF INDIVIDUALS)**



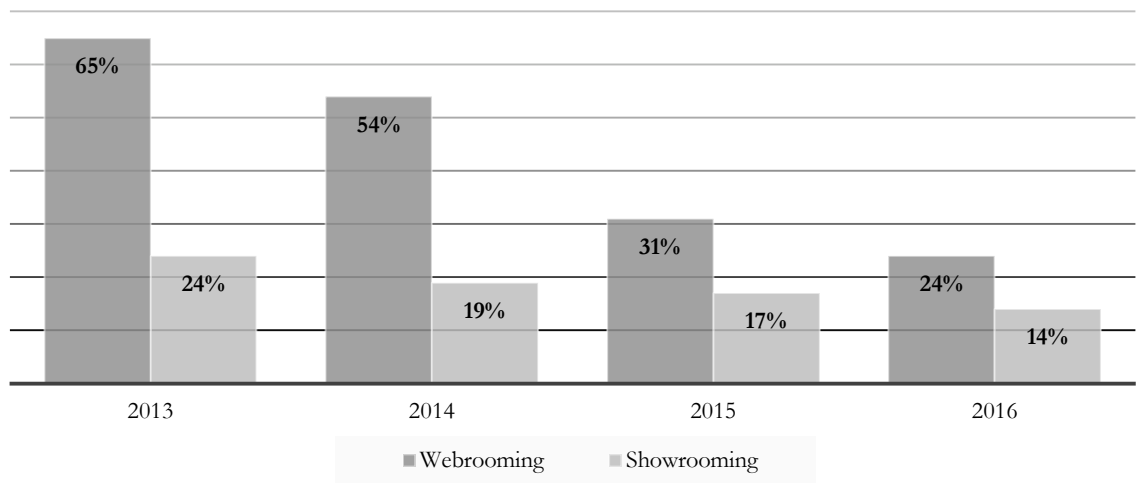
Source: Eurostat (2017)

**FIGURE II.5. FIRMS' REVENUE FROM E-COMMERCE AS A PERCENTAGE OF TOTAL REVENUE (2016)**



Source: Eurostat (2017)

**FIGURE II.6. INCIDENCE OF WEBROOMING & SHOWROOMING (2013-2016)**



Source: E-barometern (2014, 2015, 2016 & 2017)

## Appendix II. Data

**Table VI.1.** List of lines of business and relevant data

Code	Line of business	Tot. nr of firms	Tot. revenue 2007 (in thousand SEK)	Tot. revenue 2015 (in thousand SEK)
1	Computers, programs, sound, vision, computer- & videogames	862	22305623	42975363
2	Books	443	2572733	5037597
3	Shoes	370	4997820	6868563
4	Health/supplements	374	1425552	3931447
5	Beauty products & perfumes	325	1419294	2983516
6	Men & women's clothing	2375	29544738	51256369
7	Eyewear, lenses, opticians	655	2877775	6234597
8	Sport & leisure	1078	11301785	19605867
9	Watches	170	830521	3671996
10	Toys & games	198	985744	1736608

**Table VI.2.** List of observations and important variables

Firm	Line of Business	Difference in market share (2007-2015)	Growth in market share (2007-2015)	Market Share (AVG)	First Mention Selling	First Mention / First Annual	Age
NetOnNet AB	1	2.5%	37.4%	8.1%	15	1.00	21
Siba Aktiebolag	1	-9.5%	-57.4%	11.8%	6	0.40	48
Eligiganten Aktiebolag	1	6.0%	124.0%	7.8%	3	0.20	22
Webballen Sverige AB	1	1.3%	55.5%	3.0%	15	1.00	17
Kjell & Co Elektronik AB	1	1.2%	76.9%	2.1%	15	1.00	25
Komplett Services Sweden AB	1	-0.2%	-7.3%	2.9%	15	1.00	16
GameStop Sweden AB	1	-1.2%	-56.3%	1.5%	7	0.47	21
CDON AB	1	0.3%	6.3%	4.1%	15	1.00	25
Mediamarkt	1	6.0%	124.0%	7.8%	3	0.33	10
Dustin Group AB	1	5.1%	37.6%	16.0%	9	1.00	9
Akademibokhandeln AB	2	21.0%	479.0%	14.9%	6	0.40	36
Pocket Shop Aktiebolag	2	-1.1%	-25.6%	3.8%	5	0.33	22
SF-Bokhandeln Aktiebolag	2	-0.2%	-11.6%	1.7%	15	1.00	26
Killbergs Bokhandel AB	2	-1.5%	-55.1%	2.0%	0	0.00	110
Bok & Co Aktiebolag	2	-0.9%	-48.9%	1.3%	0	0.00	43
Adlibris Aktiebolag	2	0.2%	0.9%	25.5%	15	1.00	30
Jure Aktiebolag	2	-0.9%	-50.6%	1.3%	14	0.93	21
Bjurenstedt & Co Aktiebolag	2	-1.0%	-62.6%	1.1%	0	0.00	61
Bokus AB	2	10.5%	-	5.3%	3	1.00	3
Nilson Group AB	3	-9.2%	-21.6%	38.0%	3	0.20	39
Scorett Footwear AB	3	3.8%	65.9%	7.8%	2	0.13	27
Rizzo International AB	3	0.1%	1.7%	3.6%	0	0.00	34
Sneakersstuff AB	3	2.6%	654.8%	1.7%	12	0.80	15
Bergqvist Skor Aktiebolag	3	0.7%	40.8%	2.0%	1	0.07	27
Euro Sko Group Sverige AB	3	1.1%	52.6%	2.7%	0	0.00	18
J F Johansson Skor Aktiebolag	3	-0.9%	-31.8%	2.4%	3	0.20	86
Sko-Boo Boo Carlsson Aktiebolag	3	-0.3%	-20.3%	1.2%	3	0.20	44
TAG AB Sko Aktiebolag	3	-0.3%	-28.4%	1.0%	0	0.00	25
Vagabond R1 AB	3	0.2%	17.7%	1.1%	8	0.67	13
Nordic Sport Vision Group AB	3	-3.4%	-100.0%	1.7%	0	0.00	10
Deichmann-Sko AB	3	3.0%	1673.7%	1.7%	3	0.38	9
Footway Group AB	3	3.8%	-	1.9%	5	1.00	5
Health & Sports Nutrition Group	4	14.0%	180.8%	14.7%	8	0.53	17
Per Malmqvist i Oxelösund Aktiebolag	4	-3.6%	-70.3%	3.3%	0	0.00	27
Orvelin Bodypower AB	4	-0.1%	-5.3%	1.8%	4	0.27	27
Aktiebolaget Everkost	4	-0.8%	-51.2%	1.2%	0	0.00	33
Broadview Life Sciences AB	4	-2.5%	-97.3%	1.3%	2	0.13	22
Lars Karlsson Hälsa AB	4	-0.9%	-56.0%	1.1%	0	0.00	40
Egenvård för alla Stockholm Aktiebolag	4	-1.1%	-67.1%	1.1%	0	0.00	21
Natura Med-Pharma AB	4	-3.4%	-56.5%	4.3%	0	0.00	15
Hälsa för alla Sverige AB	4	-4.1%	-80.2%	3.1%	0	0.00	21
Life Butiksdrift Sverige Aktiebolag	4	-8.4%	-41.9%	15.9%	0	0.00	12
Apotea AB	4	14.8%	15948.8%	7.5%	9	0.90	12
Hälsokostbolaget i Strömstad AB	4	-1.1%	-62.5%	1.2%	0	0.00	9
Svenskt Kosttillskott AB	4	3.1%	-	1.6%	5	1.00	7
MMSports AB	4	6.7%	-	3.3%	3	0.75	5
Yres Rocher Suede Aktiebolag	5	-31.5%	-68.4%	30.3%	7	0.47	32
Lyko Retail AB	5	5.2%	144.7%	6.2%	5	0.33	16
Grand Parfymeri AB	5	-0.6%	-25.4%	1.9%	2	0.13	50
Lush Sweden AB	5	-0.2%	-9.4%	1.9%	5	0.33	18
Eleven Stores AB	5	-2.2%	-78.8%	1.7%	2	0.13	50
Amazing Brands Stockholm AB	5	-2.7%	-74.7%	2.3%	0	0.00	33
The Body Shop Svenska Aktiebolag	5	2.9%	39.4%	8.7%	3	0.21	32
Make Up Shop Sweden AB	5	-0.5%	-17.4%	2.6%	0	0.00	22
Face Stockholm Aktiebolag	5	-2.2%	-77.5%	1.7%	0	0.00	30
Parfym Sverige AB	5	2.9%	2150.9%	1.6%	8	1.00	9
Rapunzel of Sweden AB	5	4.3%	-	2.1%	1	0.14	8

Firm	Line of Business	Difference in market share (2007-2015)	Growth in market share (2017-2015)	Market Share (AVG)	First Mention Selling	First Mention / First Annual	Age
Rituals Cosmetics Sweden AB	5	7.4%	-	3.7%	0	0.00	5
Skinscity Sweden AB	5	4.0%	-	2.0%	4	1.00	4
Sephora Sweden AB	5	3.5%	-	1.7%	0	0.00	3
KappAhl Sverige AB	6	-4.3%	-39.1%	8.9%	0	0.00	61
Lindex Sverige AB	6	2.5%	60.5%	5.4%	7	0.47	56
Ellos AB	6	-2.9%	-44.4%	5.0%	9	0.60	71
Dressmann AB	6	-1.3%	-29.8%	3.8%	0	0.00	19
Departments & Stores Europe AB	6	-1.3%	-39.9%	2.5%	1	0.07	18
Indiska Magasinet Aktiebolag	6	-1.1%	-42.4%	2.0%	3	0.20	107
Cubus AB	6	0.1%	6.0%	1.6%	2	0.13	27
Grolls AB	6	0.0%	-1.4%	1.4%	0	0.00	53
Peak Performance Production AB	6	-0.7%	-42.5%	1.3%	0	0.00	29
Filippa K Aktiebolag	6	-1.0%	-49.4%	1.5%	1	0.07	22
Esprit Sweden Aktiebolag	6	-1.1%	-67.7%	1.0%	0	0.00	33
Poco Loco Svenska AB	6	-0.6%	-40.4%	1.1%	0	0.00	19
H&M Hennes & Mauritz Sverige AB	6	3.6%	39.7%	10.8%	3	0.21	44
Zara Sverige Aktiebolag	6	0.1%	10.7%	1.4%	0	0.00	16
NLY Scandinavia AB	6	2.2%	4297.1%	1.2%	11	1.00	12
MQ Retail AB	6	-2.4%	-43.7%	4.3%	4	0.44	9
Holmqvist Optik i Örebro AB	7	-0.8%	-56.2%	1.0%	0	0.00	22
Synoptik Sweden Aktiebolag	7	-5.4%	-28.1%	16.6%	0	0.00	14
Direkt Optik Aktiebolag	7	-1.6%	-51.7%	2.3%	0	0.00	23
LensOn AB	7	2.3%	237.4%	2.1%	10	1.00	11
Optik Smart Eyes AB	7	7.0%	19450.9%	3.5%	3	0.38	9
Synsam Drifts AB	7	17.1%	-	8.5%	5	0.83	7
Stadium Sweden Aktiebolag	8	-6.9%	-23.6%	25.7%	7	0.47	32
Intersport Sverige AB	8	-4.1%	-18.1%	20.7%	5	0.33	44
Naturkompaniet AB	8	0.4%	17.6%	2.2%	15	1.00	24
Team Sportia Aktiebolag	8	-1.1%	-43.5%	2.1%	1	0.07	28
Hööks Hästsport AB	8	0.3%	16.9%	1.9%	15	1.00	44
Stadium Outlet Aktiebolag	8	3.5%	892.8%	2.1%	1	0.07	31
Dormy Golf & Fashion Aktiebolag	8	0.8%	65.2%	1.7%	14	0.93	21
Addnature AB	8	1.1%	386.0%	0.8%	12	0.80	15
Junkyard AB	8	0.5%	94.3%	0.8%	11	0.79	15
Sportamore AB (Publ)	8	2.8%	-	1.4%	5	1.00	6
Swedemount Sportswear & Fashion AB	8	1.3%	100.6%	1.9%	1	0.33	3
Ur & Penn AB	9	-2.9%	-20.0%	12.9%	1	0.07	24
AB Nymans Ur 1851	9	-3.5%	-19.6%	16.1%	0	0.00	16
Rob. Engström AB	9	0.5%	12.8%	3.9%	0	0.00	57
Job. Engströms Ejfr. Aktiebolag	9	-2.0%	-42.1%	3.8%	0	0.00	61
Bo Berggren Urhandel Aktiebolag	9	0.1%	10.1%	1.3%	0	0.00	51
Aktiebolaget Rydbergs Ur	9	-0.1%	-7.2%	1.4%	0	0.00	38
Ur & Glasögon Huke Aktiebolag	9	-0.3%	-17.5%	1.5%	0	0.00	54
Pagoldbs Ur Aktiebolag	9	-0.1%	-3.6%	1.4%	0	0.00	26
Bergströms Ur Uppsala AB	9	0.4%	38.5%	1.2%	0	0.00	15
Gunnar Nilsson Urhandel Aktiebolag	9	0.1%	10.4%	1.3%	0	0.00	50
Tempora AB	9	-1.0%	-43.1%	1.9%	0	0.00	12
Tempora Malmö AB	9	0.2%	17.2%	1.3%	0	0.00	10
AB Fabulous Brands Sweden	9	1.6%	-	0.8%	0	0.00	9
Daniel Wellington AB	9	39.0%	-	19.5%	2	1.00	4
Butterick's Leco AB	10	-0.4%	-7.9%	5.0%	7	0.47	46
Hikmet Leksaker och Fritid Aktiebolaget Turax	10	4.7%	222.1%	4.5%	7	0.47	31
Aktiebolaget Turax	10	-0.8%	-21.7%	3.2%	0	0.00	50
Lekhuset i Norrköping Aktiebolag	10	1.7%	60.3%	3.6%	0	0.00	36
Leksakshuset i Karlskrona AB	10	-2.1%	-45.0%	3.6%	0	0.00	17
Lekit AB	10	4.2%	2771.7%	2.2%	13	0.87	11
Aktiebolaget Sagoland	10	-1.5%	-45.9%	2.6%	0	0.00	58
Södertälje Leksaks Aktiebolag	10	0.7%	29.8%	2.8%	0	0.00	37
Magasinet i Umeå AB	10	-1.7%	-52.3%	2.4%	0	0.00	27
Viking Toys AB	10	-2.0%	-59.5%	2.3%	0	0.00	28
Magasinet i Luleå AB	10	-2.9%	-70.6%	2.6%	0	0.00	18
Leksakshuset i Eslöv Aktiebolag	10	-1.1%	-40.1%	2.2%	0	0.00	25
Magasinet i Östersund AB	10	-1.5%	-54.0%	2.1%	0	0.00	15
Krabat & Co AB	10	-0.5%	-20.8%	2.1%	4	0.27	16
Magasinet i Hemlingby AB	10	-0.9%	-49.4%	1.4%	0	0.00	21
Lek-Center Aktiebolag	10	-1.0%	-50.6%	1.4%	0	0.00	52
BusLek i Solna AB	10	-0.6%	-34.7%	1.4%	0	0.00	12
Leklust i Helsingborg AB	10	-0.2%	-16.7%	1.2%	0	0.00	26
Nallens Stormarknad Aktiebolag	10	-0.4%	-25.8%	1.2%	0	0.00	25
Barnhuset i Stenungsund AB	10	0.0%	0.5%	1.0%	0	0.00	15
Magasinet i Söderhamn AB	10	-0.5%	-34.0%	1.3%	0	0.00	14
Lekgruppen i Sverige AB	10	-1.6%	-47.2%	2.6%	0	0.00	12
Sickla Lek AB	10	0.0%	-1.7%	1.0%	0	0.00	12
Extra Toys Eda AB	10	-0.2%	-20.3%	0.8%	0	0.00	10
Extra Toys Nordby AB	10	0.9%	815.7%	0.6%	0	0.00	10