STOCKHOLM SCHOOL OF ECONOMICS

Product Comparison Agents, Consumer Behavior and Retailer Strategy

A Study in the Consumer Electronics Market

Master Thesis

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Defense date: 2012-06-01

Abstract

Product Comparison Agents (PCAs) are search engines that retrieve, aggregate and process product and price information from different retailers' websites and present it in an appropriate format to facilitate consumer decision making. The purpose of this thesis is to discuss how PCAs are influencing consumer decision making, and how retailers can respond in order to stay profitable and avoid price pressure.

This quantitative study analyses a number of variables that are assumed to impact a firm's ability to charge price premiums, such as brands, direct links, the number of physical stores, reputation and recommendations from manufacturers. Surprisingly, the only factor with a significant impact on price premium was a strong brand. The major finding of this study was the lack of relationship between many of the investigated factors and price premium. These results highlight the increased difficulty for premium retailers to avoid price pressure. The results are to a large extent not consistent with previous research, which might be explained by the extreme nature of the consumer electronics market in Sweden.

1. INTRODUCTION

Product Comparison Agents (PCAs) are increasingly important and powerful actors in today's consumer markets. PCAs are a search engines that retrieve, aggregate and process product and price information from different retailers' websites and present it in an appropriate format to facilitate consumer decision making. PCAs importance and power over markets stem from the fact that PCA has revolutionized the pre-purchase phases in the consumer decision making process. For example, 77% of consumers use PCAs before buying consumer electronics online (HUI Research, 2012). This thesis will analyze the PCA firm, its effects on consumer decision making, and how retailers can design their offerings in order to stay competitive in these new environment characterized by increased commoditization and price pressure.

According to HUI Research (2012), electronic commerce stands for a significant proportion the total economy. The retail market of physical goods sold online is estimated to 5 % of the total retail market in Sweden, a market share valued to 27.7 billion SEK. When including non-physical products, like music, video and software for download, or digital tickets for events and travel arrangements, the market size is even larger. As illustrated in Figure 1, the growth of internet commerce has been impressive over the last decade. Even if the growth has been slowing down the last years, the increase of 10.6% in 2011 is still strong compared to the traditional *brick-and-mortar* retailing market which at the same period grew with 0.8%. The growth is likely to continue for a long period of time since younger generations to a larger extent has adopted online shopping compared to older generations (HUI Research, 2012).

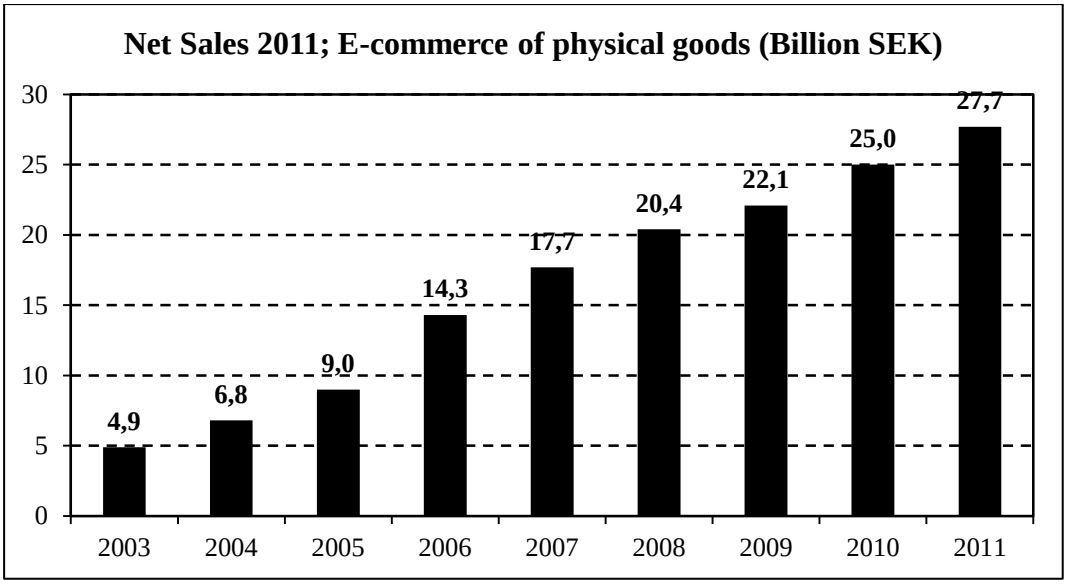

Figure 1

The online distribution channel is especially popular in some product segments. In the market of physical products, *Consumer Electronics* is considered as the largest segment counted in market value, which is estimated to 6.7 billion SEK in 2011. The growth of 14% the same year was also above average. Cloths/shoes is the second largest segment, followed by Books/Media. Books/Media is the largest segment when counting the number of purchases (HUI Research, 2012).

Internet has changed markets in many ways, and one important factor is that the internet provides consumers with access to tremendous amounts of information. This information can be used to decrease information asymmetry and help consumers make better decision in the marketplace. Internet facilitates information search regarding product characteristics, but also information regarding the sellers, their offerings and prices. Internet allows consumers to compare a larger number of retailers' offerings with less effort compared to pre-internet when internet didn't exist and consumer physically had to visit stores, make phone calls or receive advertising in order to get the same information.

But the enormous amounts of information also cause new kinds of problems. Having access to information is not the same as being able to find and make use of it in an efficient way. Finding the specific information a consumer is searching for can be like looking for a needle in a haystack. Traditionally, consumers have used regular search engines, like Google, to search for products he or she were interested in buying. A regular search engine will for most of the cases help the consumer to find several relevant offers, but what about the hundreds or thousands of offerings not displayed on the first couple of search pages? It is not possible, or extremely time consuming, for a consumer to find out about all available relevant offerings using a regular search engine. This makes it almost impossible for customers compare them all and make rational decisions to maximize the perceived value. The enormous amounts of information online can also be a problem for sellers. Even though internet provides new possibilities to communicate, it gets increasingly difficult to reach through to the consumers because of the extreme amount of information available.

This information-overload-problem is the main reason for the emergence of PCAs. PCAs are basically a search engine that retrieve, aggregate and process product and price information from different retailers' websites and present it in an appropriate format for online consumers. PCAs facilitate consumer decision making by presenting information from different retailers on one single website. Consumers can easily compare different offers, and pick the one they consider best. PCAs are very important intermediaries in many industries characterized with

more or less homogenous products where products and offerings easily can be compared. They are often specialized in a specific product segment, such as consumer electronics, electricity/phone subscriptions, insurances, loans and flight tickets etc. There are also PCAs for more differentiated products such as holiday accommodation and real estates. PCAs aren't just a tool for comparing price information, but also product features. A PCA can therefore be used both to compare different products and retailers.

PCAs is not a new phenomenon, there are examples of PCAs since the early days of the internet. Two of the largest PCAs in Sweden are *Travelpartner*, founded in 1997, and *Pricerunner*, founded in 1999. However, the number of PCAs and their importance has increased significantly over the last years, probably a consequence of the growing e-market in general. Figure 2 displays the net sales of twelve of the largest PCAs in Sweden during 2010. As illustrated, the growth is significant; 127% for a period of four years (a list of the PCAs can be found in Appendix 1). The importance of PCAs becomes even more obvious when looking at the number of users. Prisjakt.se, the one of the largest PCA for consumer electronics have about 800 000 unique visitors each week (KIA-index, 2011).

PCAs are specialized in different industries, and the power and importance of these intermediaries differs between industries. The consumer electronics industry is of specific interest in this case. According to a survey by E-barometern (2011), 77% of the online consumers do use PCAs before buying consumer electronics. This makes PCAs the number one information source in the consumer's information search process. There is no doubt that PCA is a very important factor in this market and they have, and will continue to shape the rules in internet retailing markets.

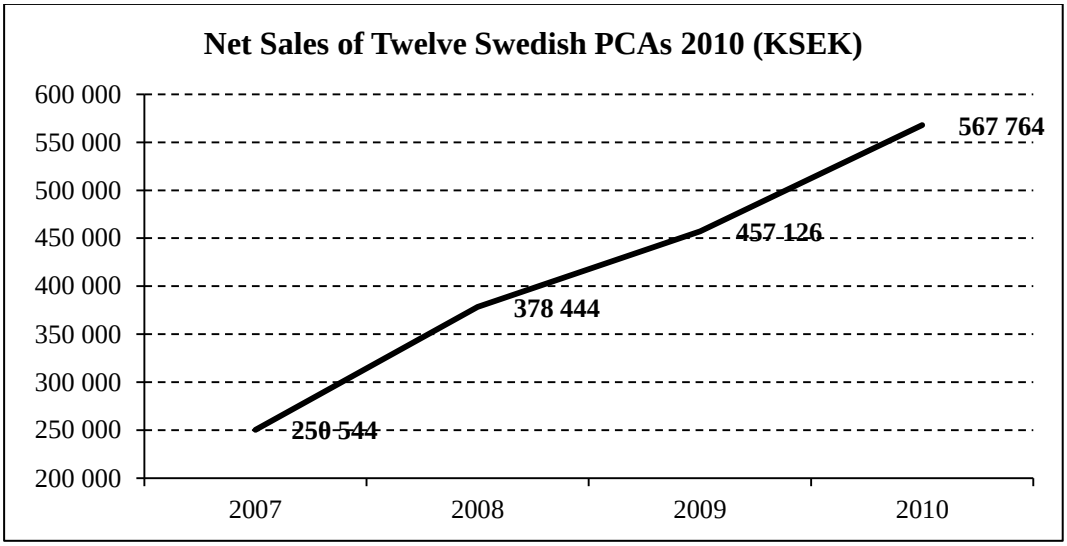

Figure 2

1.1. Problem Formulation

The emergence of PCAs has changed the business environment for many online retailers. This is especially true for retailers of consumer electronics where 77% of all consumers do use PCAs to evaluate different offers before consumer electronics online (HUI Research, 2012). Consumer electronics is also to a large extent characterized with homogenous products. Most retailers sell products from the same large international manufacturers with well-known brands and there isn't much of a difference between retailer offerings. It becomes increasingly difficult for retailers to differentiate their offers. This contributes to an increased focus on price, and the growing presence of PCAs contributes to this development since they are very price focused in their communication toward consumers (the offerings are for example sorted by price by default). This seems like a very beneficial development form the consumer's point of view, but from the seller's perspective, the extreme focus on price threatens to completely erase their profits. Little research is made in order to find out how the emergence of PCAs has affected consumer behavior, and how sellers should respond in order to defend their positions and still make profits.

Previous research has so far been focused on PCAs impact on market efficiency (e.g. Smith, 2001, Bakos, 1998, Baye & Morgan, 2004). In the early days of the internet, micro economic researchers expected PCAs to erase search costs and lead to frictionless markets with no price dispersion, prices was expected to fall down to marginal cost (E.g. Kuttner, 1998, Alba et. al., 1997). Later these assumptions were proven incomplete, but since the starting point for most of the previous research has been in micro economic theory, price dispersion is regarded as a problem, an effect of market imperfections that should be solved. Micro economics doesn't regard price dispersion as a possibility for successful sellers to differentiate their offers and be able to charge a price premium. Limited research have taken the sellers perspective, trying to understand how to succeed in these markets.

1.2. Research Questions

PCAs are a contemporary and unexplored research area, with many questions waiting to be further explored. This thesis will not answer them all, but rather introduce the concepts into marketing research and start to answer some of the most important questions regarding consumer behavior and seller strategy.

The main research question of this paper is *how* online retailers can reach profits and charge price premiums for their offers in commoditized markets where PCAs dominate.

In order to answer the main question, this paper will also discuss the question of *how* PCAs has changed consumer decision making.

1.3. Purpose

This thesis will take a different theoretical viewpoint in order to analyze PCAs impact on markets. Previous research starts in micro economic theory where market efficiency is the ultimate goal and where seller surplus is seen as a problem. This research provides no support for retailers of how to make profits and compete successfully.

This thesis introduces a different theoretical framework in order to understand how PCA change markets. PCAs change consumer behavior, and especially how consumer search and evaluate alternatives to satisfy their needs. By understanding how to decrease search costs, and what criteria consumers use when evaluation retailers on PCA sites, retailers can design their strategy and offerings in a different way than solely compete on price.

1.4. Thesis Outline

The first part in this study will introduce the Product Comparison Agents as a firm, focusing on its functions and business model. Then, the PCA are put into a market context in order to understand that PCAs do play an important role in many of the basic functions that needs to work in order for a market to work efficiently.

The second section of this thesis covers some frameworks regarding consumer decision making. The third and last part of the theoretical discussion will then merge previous research regarding PCAs with the frameworks of consumer decision making. Two stages in the consumer decision making process model will be elaborated further; *pre-purchase search for information* and *pre-purchase evaluation of alternatives*. Based upon a discussion of how the use of PCAs impact consumer decision making, hypothesis will be developed.

The last sections of this thesis will then test and discuss the hypothesis.

2. INTRODUCTION TO PRODUCT COMPARISON AGENTS

The first part of this section will introduce the concept of PCAs. It will answer basic questions about what a PCA is and what kind of functions it performs. The first part will also summarize PCA's business model and how it balances the contradictive demand of the users and the retailers. The last part will discuss previous research where PCA is discussed in the context of micro economic theory and market efficiency.

2.1. Definition of Product Comparison Agents

Websites allowing consumers to find and compare different products has been around for some while, but must still be considered as a new topic for scholars. Therefore, there is some confusion regarding what this phenomenon should be called and defined. *Shopbots, Recommendation agents, Buyers agents, Aggregators, Price comparison sites, Internet shopping agents, Comparison-Shopping sites, Comparative shopping agents and Comparison shopping services* are some examples of terms names by scholars. There are some attempts to unravel this mess of concepts, and the definition used in this paper is provided by Wan et. al (2007). They suggest the concept *Product Comparison Agent* (PCA) as a general name for these kinds of services. A PCA is a web based online service that retrieve, aggregate and process product and/or price service information from heterogeneous online data sources as well as online consumers and present it in an appropriate format to online shoppers for choice-related decision making. In other words; A PCA is a service that collects product information (both price and other information) from different retailer sites, and presents it on their website to facilitate comparison and decision-making for consumers. Consumers can also contribute to these sites by writing comments and rate products and sellers. A PCA serves as an information intermediary that facilitates market transactions, but they are not involved in the transaction themselves. A PCA do not sell any goods.

Smith (2002) describes three generations of PCAs; *Stand-alone*, *Contextual* and *Personalized* PCAs. Although these three types of categories might illustrate the evolution of these services to some extent, it is not like all *modern* PCAs are personalized PCAs. There is no clear cut between these three categories, many PCAs overlap in several of these categories. A Stand-alone PCA refers to a service that is solely based on price information. This kind of service assume that the customer know what he/she want to buy, and just want to find the lowest price. A contextual PCA also provides product information in addition to price information. This means that the customer in a first stage can use the service to compare different product

features before making a decision of what product he or she wants to buy. The consumer will later in a second stage receive information of sellers and their prices when the product is chosen. A personalized PCA takes this even further and is most useful in markets with diversified products. The buyer starts by typing in its preferences, and the PCA will then find the product that fits the customer's preferences best. One Swedish example of this kind of site is Hemnet (www.hemnet.se) which aggregates properties for sale by real estate agents. The customers starts by entering search criteria based on his or hers personal preferences, like location, price range, size etc. All available offerings will later be shown in a list format.

2.2. Product Comparison Agents and Business Models

PCAs got interesting business models. In order to understand the business models of PCAs, you need to understand who the customers are and what they demand. PCAs must provide a good offer for consumers; otherwise no one would be using the site. Good for customers in this case are mostly about facilitating customer decision making and the ability to find bargains. At the same time, all of the PCAs revenues stem from the retailers, and they have completely different demands. Retailers want to maximize their revenues and profits by charging as much as possible from the consumers. A successful PCA must be able to offer value for both consumers and retailers despite the conflicting demands.

The value proposition towards retailers is about providing a marketing tool. PCAs have two major revenue streams (Smith, 2002). The first one is that sellers can buy advertising space and promotional services on the website. A promotional service is for example that their logotype is displayed, or that the seller has a direct link to their site where the consumer can make the purchase. The second revenue stream is commission from the transaction that takes place between the sellers and the buyers. This requires an agreement between the PCA and the sellers allowing the PCA to debit the retailer a percentage based fee of the transaction value. In order for this to work, the PCA uses a tracing mechanism (*tracking cookie)* which is a software that record any purchase the consumer execute after leaving the PCA website.

PCAs revenue model highlights an interesting dilemma; which sellers should be listed on the site? If prioritizing consumer value, all available retailers should be included in order to provide as much information as possible for the consumer. But there is no way a PCA can sign agreements with all existing sellers on the market. Some sellers have few incentives for cooperating with PCAs since they wouldn't benefit from price competition.

Different PCAs handle this dilemma in different ways, and there are therefore two different kinds of PCAs on the market today; the ones who include (almost) all sellers regardless if there is an agreement or not, and PCAs which only list sellers that provide them with revenues. Swedish examples of the first category are Pricerunner.se and Prisjakt.se, while Compricer.se belongs in the second category.

But how do PCAs retrieve price information from sellers? Prisjakt.se for example has price information from 3470 sellers which makes manual work impossible. There are two different methods for PCAs to compile price information (Castenbäck and Wennerström, 2007, Johansson, 2011). The first one is that the PCA downloads a digital price file from the seller regularly, often several times a day, which requires a partnership between the PCA and the seller. The price file enables accuracy and frequent updates. The second alternative process for collecting information works even though there is no agreement between the parties. In short, PCAs develop *spiders,* a software that searches the internet and automatically recognizes product offerings and prices of sellers. This means that sellers do not have a choice whether they want to participate in a PCAs website or not. Some previous research regarding PCAs (e.g. Iyer and Pazgal, 2003) presumes incorrectly that sellers do have a choice.

A service similar to PCAs for brick-and-mortar stores are the *referral sites*. These websites allow consumers to write comments about physical stores (Iyver and Padmanabhan, 2006). A Swedish example of such a site is Rejta.se.

Another difference between different kinds of sites is what kind of products they cover. Many sites are specialized in a specific industry, like consumer electronics, flight tickers, hotels, insurances, electricity etc.

2.3. Objectivity and Credibility

One important aspect of PCA are their objectivity and credibility. As discussed earlier, PCAs got divided loyalties and they need to balance the different demands from both consumers and retailers. The fact that all revenues stem from the sellers, you might assume that it must be tempting for a PCA to put more emphasis on seller requirements. However, some PCAs include all sellers, even though they do not have any agreement of commission. A seller can therefore free ride and be listed on a PCA without paying anything. What PCAs are doing to attract paying retailers is to offer additional value for those sellers that choose to partner up. The additional value can for example be a direct link to the seller's website, an image showing the seller's logotype, additional seller information and increased accuracy of price

information (Prisjakt.se, 2012). PCAs could go one step further place paying sellers in a better position on the search list than non-paying customers. However, this would probably harm the credibility perceived by the consumers and harm the reputation of the PCA.

There is however some indications that PCAs are using questionable methods in order to provide paying sellers with extra value compared to non-paying. In a thesis from 2007, some student compared peer-to-peer ratings between paying and non-paying sellers on some of the largest PCA sites in Sweden. Rating is the grading system that consumers use to rate their experience of a seller, a very important variable displayed to consumers on PCA sites. They discovered that paying sellers had higher grades than non-paying sellers. This result has two explanations. The first one is that PCAs use different systems to gather ratings, e.g. systems that automatically ask the consumer to grade the seller after a purchase has been done. These systems are only available for paying sellers. The consequence is that that paying sellers got a lot more ratings than non-paying sellers. This results in a higher average grade since the consumers who rate on their own initiative in general are more dissatisfied (dissatisfied customers are more likely to grade than those who are satisfied). A second explanation of the difference of grading between paying and non-paying sellers is that the PCA manipulates the grades in order to provide extra value to paying customers (Castenbäck and Wennerström, 2007). In another thesis by Isaksson and Stridh (2008), interviewees from the industry revile that there are some possibilities to change bad ratings from consumers. A seller can approach a PCA and complain about a specific grade from an unsatisfied customer. The PCA can then act as a *mediator* and contact the customer to clear things out. The grade can later be changed if the customer gets *a good explanation of why the service was poor, an excuse, or another kind of compensation*. Although the magnitude of this kind of grading manipulation is unknown, these kinds of benefits are more likely to be offered to paying retailers rather than non-paying retailers.

2.4. Product Comparison Agents and Market Efficiency

In addition to the perspectives of the buyers and sellers, another perspective is the more holistic perspective of the market. The market and it functions is traditionally studied in micro economics, and PCAs ha therefore not surprisingly catches the attention in some micro economic research. The following part will review the basic functions of the market, and how internet and PCAs has been regarded as tool to decrease market friction. As will be discussed later in this section, some predictions were incorrect and the micro economic theory applied failed to explain some of the phenomena observed empirically.

2.5. The Early Days of the Internet; Predictions of Frictionless Markets

In the early days of the internet, microeconomic scholars seemed quite optimistic and enthusiastic about the potential impact of internet on markets. The basic thought was that internet would increase market efficiency, and some even argued that internet would eliminate market frictions completely and create perfect markets (e.g. Kuttner, Bakos, 1998).

The main role of the market in a market economy is to allocate resources. In order for the allocation to be efficient, some basic function needs to work properly. These functions can be categories into three major segments; *matching buyers and sellers*, *facilitation of transaction* and *institutional infrastructure.* The following section will summarize how Bakos (1998) believed internet would affect these functions of the market. In addition, to the implications of the internet described by Bakos, this section will also briefly describe the PCAs role in these functions.

Matching of buyers and sellers

Determination of product offerings

One of the markets most fundamental functions is to match supply and demand. In order to maximize the utility of the available resources for production, these resources must be matched with market demand. In order to maximize profits, sellers align their production according to market demand, cost of production, technology and the transaction costs. Buyers later consider factors such as price and product features in order to pick the product that fits their needs. Bakos (1998) believed that the internet would create new opportunities for personalization and customization of products because of the possibility to identify preferences of individual buyers.

Although internet probably facilitates personalization and customization in many ways, the PCAs mostly include homogenous products. In order to make different offers easier to compare, the emergence of PCAs probably promote standardization of offers since the PCA decide on what dimensions to compare offers.

Search

The area of information search is especially interesting in the context of internet and PCAs. A buyer needs to gather information about factors such as price and product features in order to make rational choices. This information gathering is associated with *search costs.* Search costs includes the opportunity costs of searching, but also more direct costs like car fuel (when visiting stores) or making phone calls.

Sellers are also exposed to search costs. First, sellers need to collect information about customer preferences in order to align their production resources accordingly. This includes cost for activities like market research. Another category of search cost is advertising and other activities sellers perform in order to facilitate the buyer´s search process.

Sellers can exploit consumer´s search costs in order to increase their prices and profits. A seller doesn't benefit of search costs associated with their own offerings, but they do benefit from high search cost associated with competing offerings from other sellers. When search costs for competing offerings are high, a seller can exploit this cost and increase their own prices. For example; imagine that you are about to buy a new MP3-player. You enter a local shop you are passing by to take a look. You find a product you like, and the choice now is whether to buy it or not. The alternative is to continue searching in other stores, with a chance to find an even better MP3-player, or maybe the same one for a lower price. This choice would rationally be determined by the expected benefit of continued search and the cost of the continued searching. If the expected benefit fall below the perceived search cost, you would probably buy the product. But if you think that you at a very low cost would find a lot better product, or a much cheaper one in another store, you would continue searching. This means that your local store in this example could charge a price premium, as long the price premium is lower that the extra search cost. The consumer chose the offer witch has the lowest total cost including both the price of the product and the search cost.

This reasoning makes sense in conventional markets before the emergence of the internet, where search costs to a large extent was determined by the physical distance between the buyer and seller. These kinds of search costs have traditionally been equally distributed across sellers (Smith, 2001). In the previous example, this means that even though your cost of searching was lower for your local shops offerings compared to other sellers, the opposite is true for another consumers living close to another store. These consumers are on the contrary prepared to pay a premium for not having to visit your local store to get information about their offerings.

Bakos (1998), Kuttner (1998) and Laudon and Traver (2010) argue that internet will decrease search cost dramatically. It will become a lot easier for buyers to get information about prices and product features from a larger number of sellers. This argument also makes sense in the example above. Today, you might not even consider going to any physical store before you have checked their website first to get information regarding product features and prices. Search costs on the internet are doesn't depend on the any physical distance, online search

cost is not lower for your local stores offerings; it takes the same time to enter your local shops webpage as anyone else's. Websites are also a tool for lowering costs for the seller. It is a lot cheaper for the seller to communicate offerings online than having to communicate through printed ads or direct mail.

In addition to the elimination of search cost, internet will also facilitate consumers to make more rational decisions. When search costs decreases, it becomes easier for consumers to find information about a much larger number of sellers and offerings. Instead of just knowing about your local stores offerings, internet makes it possible for you to get information from a majority of all the sellers in the whole country, or even the whole world. This makes it easier for buyers to find better offers, with lower prices. Lower search cost might therefore also decrease costs of the product itself and increase the surplus of the consumers. On the contrary, the seller surplus will decrease because of this increased scope of competition. Today, sellers don't just compete with their local rivals; they compete with internet retailers from all over the world.

The increased competition will be more significant in commoditized markets with homogeneous products. Bakos (1998) believed that Internet had the potential to completely eliminate seller surplus, and push prices down to marginal cost. This development will reward sellers with a cost advantage, while other sellers will lose. In response, disadvantaged sellers are assumed to differentiate through customized and personalized features, through services or innovation. Differentiation will not be as much about geographic as it has been in traditional markets. Differentiated sellers will also do their best to obstruct for consumers to compare prices and other product features. Increased differentiation might lead to higher prices and seller profit, and this might offset for the decreased search cost.

All things mentioned by Bakos regarding internet and search cost is also to a large extent true to PCAs. Before PCAs existed, it was very time consuming surfing around to find out about offers. A PCA does this job for the consumer, collecting information from diverse sources and present it in an efficient way. A PCA therefore decrease the search costs to a large extent. The impact of PCAs on search costs will be discussed further later in this thesis.

Price discovery

Price discovery is the process to determine the price where supply and demand clears (Bakos, 1998). Prices are crucial in allocating the surplus of the transaction between the sellers and the buyer. There are different ways to establish prices, e.g. direct negotiations between the seller

and buyer or auctions. Internet was predicted to enable new kinds of price discovery processes, e.g. online auctions and new possibilities of price discrimination.

As Bakos predicted, PCAs are certainly a new kind of intermediary that facilitates the function of price discovery. Although prices aren't established by auctions like on Ebay, PCAs increase price transparency and make it easier for customers to get an overview of the pricing. PCAs will certainly influence consumer's perception of prices, even outside the specific market in a PCA site. PCAs work as a tool for consumers to check prices, and the awareness of the prices online will certainly also impact a person's reservation price when shopping in a traditional store as well. I person might think that *"I won't pay more than 10% extra compared to the lowest price online".*

Facilitation of transaction

Logistics and settlement

After the buyer and sellers has reached an agreement, the product needs to be transported to the buyer (logistics), and the payment needs to be transferred to the seller (settlement). E-markets improve information sharing, lowering the cost of logistics and promote quick and just-in-time deliveries and reduced inventories. New electronic payment systems will also decrease transaction costs. Although this is true, PCAs aren't involved in this specific function. PCAs are intermediaries and do not participate in the delivery or payment process.

Trust

Markets need trusts to protect buyers and sellers from opportunistic behavior. Trust is generated by mechanisms such as credit systems, and better business bureaus which track reputation and discourage opportunistic behavior. Bakos (1998) also predicts correctly the establishment of new kinds of intermediaries to establish trust regarding credit/payment systems and reputation of sellers.

PCAs can play an important role to establish trust in the marketplace, which will be discussed further later in this thesis. PCAs track retailer's reputation by allowing consumers to rate their experience of the seller. PCAs therefore provide information to customers in order to increase trust and helps consumers to avoid fraudulent sellers.

Institutional infrastructure

The institutional infrastructure is what governs market transactions, a function typically provided by governments. Institutional infrastructure can for example be laws regarding

contracting, dispute resolution, intellectual property protection and anti-trust. This also includes the monitoring and enforcement mechanisms for these laws and regulations.

Although this function to a large extent is the responsibility of governments, PCAs can play a role here as well. Pricerunner for example, a PCA mostly specialized in consumer electronics, have a black-list and an observation list in order to warn consumers from certain sellers. The most common reason for being listed is bankruptcy (Pricerunner, 2012).

2.6. The Law of One Price

Search cost and imperfect price information are the primary causes of price dispersion (Bailey et. al., 2007), and early predictions suggest that the elimination of search costs would drive prices for commodity goods toward marginal cost (Kuttner 1998, Bakos, 1998), this according to classic micro economic theory (Law of one price).This means that no seller can charge a different price than anyone else. Any seller who charges above marginal cost won't sell anything since consumers will chose other cheaper sellers. A seller who charges below marginal cost will make financial losses and thereby go out of business in the long run. When the search cost is zero, there are no prices "low enough" for consumers, they will always be aware of the lowest prices and price premiums will be eliminated. This is true for commodity goods since the customer knows that the benefit will become the same regardless of which seller they choice. This development will erase seller surplus and increase customer surplus (Iyer and Pazgal, 2001).

2.7. Empirical Evidence of Price Dispersion

In contrast to the theoretical prediction, empirical research has discovered significant price dispersion for homogenous goods in electronic markets. This means that sellers still find ways to charge more than marginal cost. The research regarding price dispersion has covered different kinds of industries and product categories, like books (Smith and Brynjolfsson, 2001), CDs, videos and books (Iyer and Pazgal, 2003), computers (Bailey et al., 2007), digital cameras (Ma et al., 2010) and consumer electronics (Luo and Chung, 2010, Baye and Morgan, 2004). One of the most comprehensive studies is the one performed by Smith and Brynjolfsson (2001). They studied consumer choice data for a range of book titles on a PCA website. The data set included search information from 39,635 search sessions and 1,512,856 retailing offerings. One should notice the difference of search data and purchase data. What they measured is how consumers were searching on a PCA, and what factors that was driving traffic (click-troughs) to different retailer sites. A click-through is not the same as a purchase,

but the correlation between the two variables are very high. The result shows significant price dispersion. On average, the lowest price a customer was offered after a search was 33% less than the average price visible in the search results. Even though the consumer was searching for a homogenous product (books), customers didn't tend to select the cheapest offering. On average, customers clicked on an offer 20.4% higher in average than the lowest price offered.

These research findings provide hope to online retailers. The existence of price dispersion in these markets shows that there are ways for retailers to charge above marginal costs and make profits. However, micro economic theory fails to explain the reasons why price dispersion exists. The following sections will analyze PCAs and the existence of price dispersion from a consumer behavior perspective in order to understand why price dispersion exists.

3. CONSUMER DECISION MAKING

The previous sections of this thesis have discussed the PCA firm itself, but also from a holistic market perspective which has been dominating the previous research of PCAs. The following section will analyze PCA from a consumer behavior perspective. In order to do so, the following section will first introduce some frameworks of consumer behavior. First, different views of consumer decision making will be discussed, which highlights some of the most important differences in previous research between micro economics theory and marketing theory. Second, the seven stages in the consumer decision making process model will be introduced briefly. The next section will then apply these frameworks in the context of PCAs.

3.1. Different Views of Consumer Behavior

A large part of the theoretical differences discussed in this thesis stem from different views of the consumer. The following section will discuss the different perspectives.

There are mainly four different perspectives of consumer behavior in academic research (Schiffman, Kanuk and Hansen, 2008). The consumer decision making process model discussed later in this paper is essentially based upon the cognitive view of consumer behavior, and some on the emotional view. Previous research of PCAs has been more towards the economic view since it stem from micro economics. The following paragraphs will briefly summarize the four different perspectives of consumer decision making.

The Economic view

Traditionally in economic research, in the so called *economic man theory*, the consumer is assumed to make rational decisions based upon cost and benefit analyzes. Rationality in this context means that the consumer is aware of all available alternatives, is capable of correctly ranking the alternatives in terms of benefits and advantages, and is able to identify the best alternative. This view is not very realistic. People rather tend to seek a satisfactory alternative rather than the best alternative (Schiffman, Kanuk and Hansen, 2008, Simon, 1955).

The Passive View

In marketing research on the contrary, the consumer is sometimes regarded as submissive to the self-serving interest and promotional efforts of markets. In other words, the consumer is seen as impulsive and irrational actors, open for manipulations by professional marketers. However, like the economic man theory, this is an extreme view. In addition to the persuasive

efforts from marketers, the consumers themselves do play an important role in their purchase decisions (Schiffman, Kanuk and Hansen, 2008).

The Emotional View

The emotional view recognizes the fact that purchase decisions are influenced by emotions and moods. Emotions and moods can trigger impulsive buying without any pre-purchase information search (Schiffman, Kanuk and Hansen, 2008).

The Cognitive View

From a cognitive perspective, consumers solve problems by processing information in their minds, i.e. by *thinking*. The cognitive perspective is not as extreme as the economic views, since it recognizes boundaries in human's ability to process information. Attempts to consider all available information will cause information-overload problems, and consumers therefore process as much information necessary to make satisfactory decisions (Schiffman, Kanuk and Hansen, 2008, Simon, 1955).

3.2. Overview of the Model - Seven Stages

The consumer decision process model (**Error! Reference source not found.**) is a road map f consumer's minds that marketers and managers can use to help guide product mix, communication and sales strategies (Blackwell, Miniard and Engel, 2006). The model is essentially based on the cognitive view of consumer behavior, and some on the emotional view. The following section will briefly summarize the whole model.

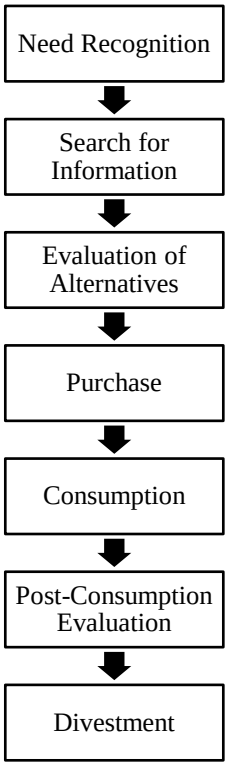

Figure 3

Traditionally, the model is used to understand how a consumer selects a product to buy, and at a later stage, how to buy it. In the context of analyzing PCAs however, some clarifications need to be done. PCAs can be used both to compare different products and to compare different retailer. In this thesis, emphasis is on which retailer a consumer chooses, and the decision process regarding which product to select is ignored. When a consumer searches for a specific product on a PCA, the consumer is assumed already to know what product to buy and the decision is all about which retailer to select. As a consequence, stage two and three in the model regards information search regarding available retailers, and evaluation of different retailers.

1. Need Recognition

The process starts when a consumer recognizes some kind of a need. The need can be triggered by both environmental and individual stimulus.

2. Search for Information

When a need is recognized, the consumer starts to search for information about how to satisfy the specific need. The search process starts with *internal search*; searching in memory for previous experiences. If the internal search process don't result in any sufficient alternative, the consumer moves on to *external search*. External search is collecting information from external sources, like pears or information from the marketplace.

3. Evaluation of Alternatives

After searching for information, the consumer must evaluate the available alternatives and select the best alternative.

4. Purchase

After deciding whether or not to buy, the consumer must decide on how to buy (Which distribution channel).

5. Consumption

The product can be consumed right after the purchase or stored and consumed at a later occasion.

6. Post-Consumption Evaluation

After consuming the product or service, the consumer compares the consumption experience with his or her expectations. The result of this comparison is some level of satisfaction or dissatisfaction.

7. Divestment

The divestment stage is about decisions of disposal, recycling or remarking.

4. THE IMPACT OF PCAs ON CONSUMER DECISION MAKING

The following section will merge the theoretical discussion regarding PCAs with the consumer decision making model. The emergence of the internet and PCAs mainly affect two stages in the consumer decision making process model. PCAs are used to find a retailer to buy a product, so the PCA impact the stages before the actual purchase. However, the first stage, need recognition, is not very relevant in this context. Although it is possible that a PCA can trigger some need, just as watching any kind of advertising, the consumer is assumed to already have recognized a need when entering a PCA site and search for a specific product. This means that the PCAs mainly influence the two stages pre-purchase search for information and pre-purchase evaluation of alternative.

4.1. Pre-Purchase Search for Information

In this stage, the consumer search for alternative solutions to satisfy its needs. As illustrated in Figure 4, there is no doubt that PCAs do have an impact in this stage in consumer decision making for consumer electronics. PCAs are the most common pre-purchase information source, followed by regular search engines, online ratings, look/try in physical store, catalogues and social media. The following section will discuss the impact of PCAs on consumer's internal and external search process.

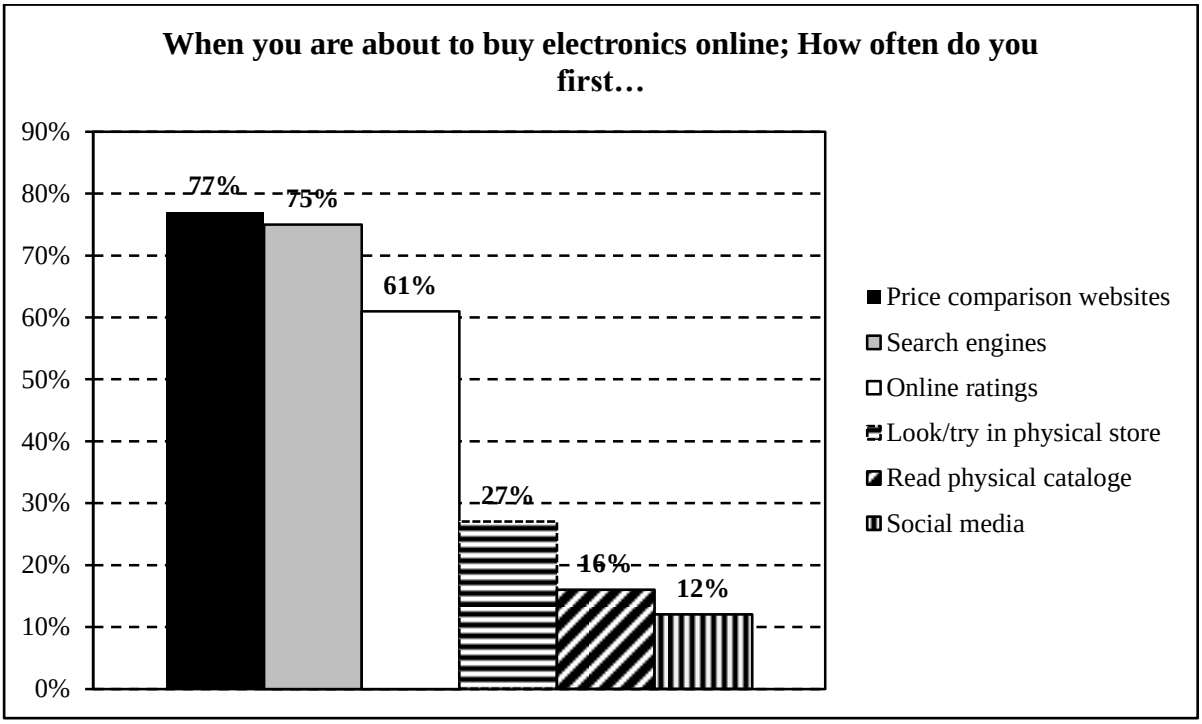

Figure 4 (E-barometern, 2012)

Internal Search

Internal search is defined as retrieving knowledge from memory or perhaps genetic tendencies, or in other words, scanning and retrieving decision-relevant knowledge stored in memory (Blackwell, Miniard and Engel, 2006). The extent of internal search depends on the existing knowledge of how to satisfy the need. This kind of knowledge can come from previous experience or previous external information search. The confidence in the knowledge plays a role as well. If the consumer doesn't trust their own knowledge, they will portably move on to external search to verify the knowledge. Consumers will put less emphasis on internal information search of they were not satisfied with prior purchases (Blackwell, Miniard and Engel, 2006).You would for example not go to the same restaurant if you were not satisfied with the food last time you went there.

As discussed previous in this paper, internet was predicted to eliminate search cost. In the early days of internet, all sites were considered as "just one click away" (Smith, 2001). Today we understand that even if the search costs associated with traditional markets to a large extent is eliminated, search costs still exist. In traditional markets, search cost was about the physical distance between the seller and buyer (section 2.5). Before the emergence of the internet, consumers had knowledge and experience mostly from their local stores, which made the internal search costs for the local stores minimal, the local store was probably the first store that was recalled in memory when thinking about how to satisfy a need. The cost for external search was also highly dependent on geography before internet emerged. It was a lot easier and cheaper to acquire knowledge about the local stores offerings compared to other stores, by just entering the physical store and have a look at the offerings, talking to the seller etc. The search costs were therefore equally distributed across retailers (Smith, 2001). Geography dependent search costs are not an issue in e-markets. The consumers can easily get information about offerings online without having to visit any physical store. This was the major argument of the prediction that internet would erase search costs (Bakos, 1998, Kuttner).

However, internet and PCAs haven't eliminated search costs completely; there are other kinds of search costs associated with internet search. Although consumers theoretically have access to almost all information possible offers, this is not true in reality. Having access to information is not the same as being able to use it in an efficient way. If accepting the cognitive view of the consumer, you understand that humans have cognitive boundaries making it impossible to process all available information since it will cause information

overload problems. The consumer will rather process as much information necessary in order to make satisfactory decisions (Schiffman, Kanuk and Hansen, 2008, Simon, 1955). These assumption is illustrated in the consumer decision process model, which assumes that the consumer starts searching for information internally first. Why? Because it is a lot faster and easier. For the most of our daily purchases, the knowledge we have in memory is more than enough to provide us with sufficient alternatives of how to solve our needs. From a search cost perspective, seller offerings can either be insiders or outsiders in the internal search process. If a seller is known and exists in the consumer's memory, the internal search costs for that seller low, it don't take a lot of effort to recall the seller from memory. However, if a seller's offering is not present in the consumers memory, the search costs is infinite. The search costs in the internal search process are therefore associated with the effort necessary to recall a seller from memory. If the consumer is not aware of the seller's existent, the seller will never be recalled from memory.

A seller benefit from low internal search costs, and the question now is how this search cost can be reduces, how a seller can make it easier to recall its offers compared to competing sellers. In marketing, the answer is branding. A brand is a name, term, sign, symbol or a combination of them intended to identify the goods and services of one seller or group of sellers and to differentiate them from those of the competition. A brand incorporates awareness, reputation and prominence (Keller et. al., 2008), and it is the ability to create awareness part that is interesting in the context of internal search costs. Some argues that brand awareness is more important than brand attitudes and brand positioning (Ehrenberg, 1997, Sharp, 2010), and this is true for sure in the context of internal information search. Awareness is divided into brand recognition and brand recall. Recognition is about recognizing a brand when you see it, and recalling is when a consumer ability to recall a brand from memory after recognizing a need (Keller, 2008).

Since what matters for consumers is the sum of the search costs and the price for the product/service, a seller can exploit low search costs in order to charge price premiums. Internet has changed the allocation of search costs across different sellers. Search cost in conventional markets is distributed equally among sellers since it was determined by geographical factors. However, brand awareness on the other is often concentrated to a limited number of sellers (Smith, 2001). The discussion above makes it clear that even though the internet has changed the allocation of search costs for internal search, PCAs don't have much of an impact since searching on a PCA by definition is external search.

External Search

If the consumer lacks knowledge about sufficient alternatives that would satisfy their need, the internal search process is not enough in order to make a purchase (Blackwell, Miniard and Engel, 2006). There are two basic categories of external information sources. *Marketer-dominated* information is persuasive information like advertising and promotions. The source for this type of information is sellers and producers. *Non-marketer dominated* information is not necessarily as persuasive and common sources of this information is pears, family or objective products ratings in media. All kinds of information can be reached both offline and online. Pre-purchase information search is search activities performed in order to satisfy a need, and is different from *ongoing information search* which takes place on a more regular basis. People tend to regularly search for information in we are where they are interested, without any purpose of buying (Blackwell, Miniard and Engel, 2006).

So what determines the extent of external search? The most common approach is that consumers end their information search when the perceived cost of additional information exceeds the perceived benefit of this information (Stigler, 1961, Urbany, 1989). This might seem like a very rational view, but the *perceived* costs and benefits don't necessarily have to be the same as the *actual* cost and benefits. The benefit in this case means the possibility to either find a better product or the same product cheaper.

There is a reversed U-shape relationship between consumer product category knowledge and the amount of external information search (Figure 5). The reason why a high level of knowledge is related to less external search is that that the consumers can find sufficient alternatives from internal search, knowledgeable customers substitutes external search for internal search (Johnson et. al., 2004, Klein and Ford, 2003). The explanation why a very low level of knowledge also result in little external information search is that some knowledge is required in order to make a useful information search (Bettman and Park, 1980). Most external search is made by intermediate-knowledgeable customers who benefit from external information, but still has enough knowledge in order to know where to find information, and what kind of information to look for (Blackwell, Miniard and Engel, 2006).

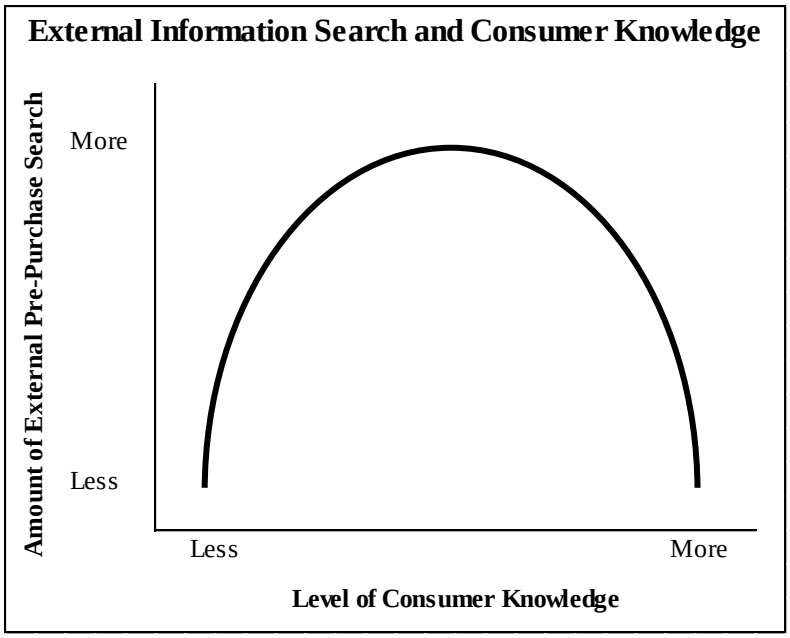

Figure 5 (Blackwell, Miniard and Engel, 2006)

External search costs

Consumers move on to external search when they are not satisfied with the alternatives provided by the internal search process, a possible scenario when there are no previous experiences of similar situations or just dissatisfactory experiences (Blackwell, Miniard and Engel, 2006). Here is where PCAs really offers value for the consumers and make a difference, and this is why the use of PCAs has increased significantly the last years. Before PCAs existed, it was very time consuming surfing around to find out about of different offers, the search costs were high. A PCA does this job for the consumer, collecting information from diverse sources and present it in an efficient way making the information search process more systematic and efficient (Peterson and Merino, 2003) A PCA should therefore decrease search costs in the external search process and enables consumers to find offers they were not aware of in the first place.

A reduction of external search costs is more important for actors with less known brands compared to sellers with lots of brand equity. As discussed previously, some actors with very strong brands should be associated by very low search costs, since consumers easily will recall their brand from memory (internal search). This will not be changed by the presence of PCAs. However, for small unknown sellers, PCAs should play a much more important role, since PCA reduces search costs for external searching. Finding a small unknown seller by searching in a PCA site is much easier than finding a small seller in a regular search engine like Google. This is because the search result in regular search engines is highly depending on the number of external links a website has (Wan et al., 2007). Sites with a large number of

external links are regarded as more relevant and are positioned higher up in the organic search result list. This means that it is a lot easier for large actors with well-established sites to get a large proportion of the traffic, while it is much harder for small actors (Wan et al, 2007). PCA is therefore a better marketing tool for small actors with unknown-brands, and small actors should therefore be keener on partnering up with PCAs compared to large well-established actors with well-known brands.

H1: Retailers with unknown brands are more likely to partner up with PCAs compared to retailers with well-known brands.

One should notice that PCAs don't just lower the search costs for price information. Consumers are interested in quality variables as well. A PCA makes it easier to compare price, products and sellers (Lynch and Ariely, 2000).

The search costs between different retailers within a PCA site is different depending on whether or not there is a direct link to the retailer's website. As discussed previously in this thesis, PCAs like Pricerunner and Prisjakt only provide direct links to retailers if they have an agreement which enables the PCA to charge commission on the transactions. If a direct link is absent, the consumers has to use a regular search engine to find the sellers website, a process more time consuming and perhaps more annoying compared to the retailers listed with a link. Since the search costs associated with the retailers listed with a link is lower, they can charge a price premium and still be considered as the best offer by consumers.

H2: Retailers listed with a direct link charge higher prices.

The linkage between internal and external search costs

There is no clear cut between internal and external search, sometimes consumers do both at the same time. Searching for information on the internet is by definition external search, but to be able to enter a website, internal search is often needed. If you want to compare different sellers for books for example, you need to recall different sellers of books (internal search) in order to enter the address to their website (external search). From panel data from over 10,000 households, Johnson et. al. (2004) studied the amount of search behavior for three product categories. The amount of search was quite limited; consumers visited on average 1.2 book-sites, 1.3 Cd-sites and 1.8 travel-sites before buying something in each category. In other words; people tend to remember just a few large and well-known brands in each product category, and the search cost for small unknown sellers are therefore high. However, this is only true when the consumers enter websites directly and do not use a search engine or PCAs.

Different kind of Decision Processes

Even though there are seven stages in the decision making model, all decision making processes don't always look the same. Decision making is characterized by a diversified level of complexity, which influence the degree of effort spent on information search and evaluation. Figure 6 illustrates a basic model were different decision making processes range between the two extremes *extended problem solving* to *habitual decision making*. Extended problem solving is associated with a high level of complexity. The evaluation is detailed and rigorous which means that the number of sources used for information seeking, the number of alternatives evaluated, and the number of criteria used in this evaluation is high. Limited problem solving is when people don't have the time, resources or motivation to engage in a complex process form making a decision. Instead of an extended information search and evaluation process, the consumer tend to use simple rules and focus on a small number of criteria, like just choosing the cheapest brand or buy the first brand the consumer recognizes. When a consumer has a lot of experience from similar purchases, the decision making can become more of a habit rather than an information processing procedure. This presumes that the consumer is satisfied with the previous purchases. In habitual problem solving, there is no information search or evaluation of alternatives before making the decision. Habitual decision making is commonly associated with brand loyalty (Blackwell, Miniard and Engel, 2006, Fill 2006).

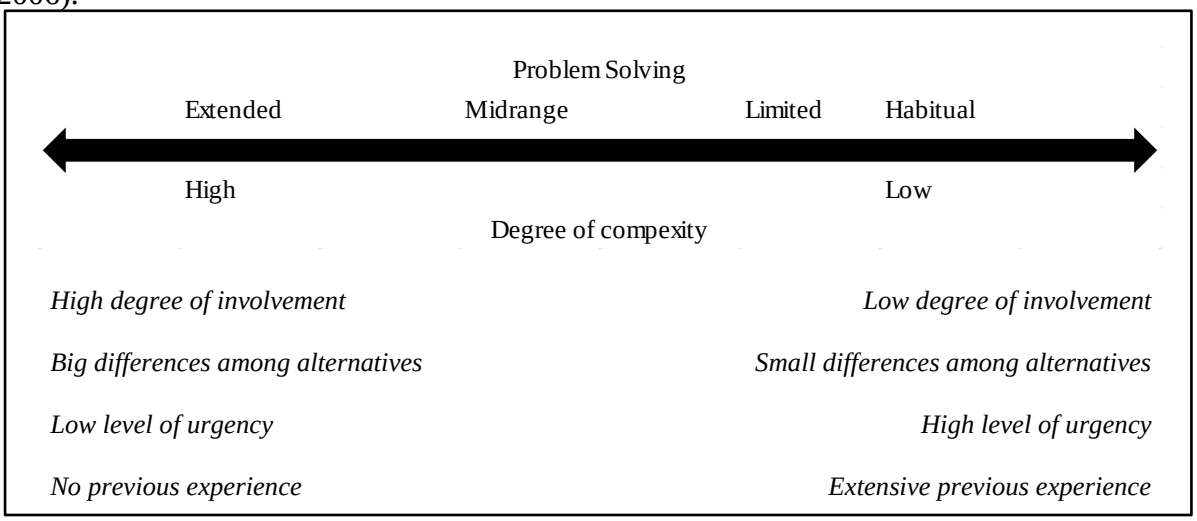

Figure 6 (Blackwell, Miniard and Engel, 2006)

There are several factors influencing the level of complexity of the consumer decision making process, like the degree of involvement, perceptions of difference among the alternatives (Laurent and Kapferer, 1985), urgency, consumer mood and previous experience (Blackwell, Miniard and Engel, 2006).

The degree of involvement is how important the product or service is perceived to be for the individual consumers. The degree of involvement is affected by *personal*, *product* and *situational* factors. Personal factors are factors that will influence the person directly, like the consumer´s self-image, health or beauty. Product factors are the perceived risk regarding performance, physiological and financial risks associated with the purchase. Situational factors could for example be if the purchase is a gift or will be consumed among others (Blackwell, Miniard and Engel, 2006). Most of the factors mentioned above are customer-specific and hard to generalize to a whole product group. The financial risk on the other hand can be approximated with the price level. If the price and financial risk is high, the model assumes a higher level of complexity regarding information search and evaluation. When consumers put a lot of effort on information search in a market with homogenous goods, it will become harder for sellers to exploit search and information asymmetry to charge price premiums.

H3: There is a negative relationship between the degree of involvement/price and price dispersion.

All Consumers do not use Internet and PCAs

Conclusions of internet search behavior cannot be generalized to consumers that do not use the internet (Peterson and Merino, 2003). Some consumers do not use PCAs at all; they are more likely to be loyal to retailers since they have limited knowledge about the available offers in the marketplace. This compared to consumers who are frequent users of PCAs and therefore are assumed to not being very loyal. Since different retailers have different customer bases, they also have different strategies for maximizing their profits. Retailers with a low share of loyal customers will use PCAs in order to attract a new mass of customers, competing on price. Firms with a loyal customer base on the other hand will have few incentives for competing on price; they can continue to charge their loyal customers at reservation price. This means that disloyal and informed consumers using PCAs will get much lower prices than loyal and uninformed customers (Iyer and Pazgal, 2003). Physical stores will have a larger share of uninformed customers compared to stores that only sell online. Physical stores can therefore to a larger extent charge price premium to exploit uninformed customers.

H4: Sellers who have physical stores charge higher prices.

4.2. Pre-Purchase Evaluation of Alternatives

After the information search process is finished, the alternatives are evaluated in order to select the alternative that is perceived to satisfy the need best out of the considered options. The process is basically about comparing the knowledge of brands with what the criteria the consumer considers as most important (Blackwell, Miniard and Engel, 2006). There are different kinds of decision rules that consumers use in order to make the decision process more efficient. In extended problem solving, consumers might evaluate a large number of important criteria and weight them according to its importance. In other less complex decision making, consumers can for example put more emphasis on the most important criteria and just chose the best one according to those criteria, e.g. the cheapest alternative (Schiffman, Kanuk and Hansen, 2008).

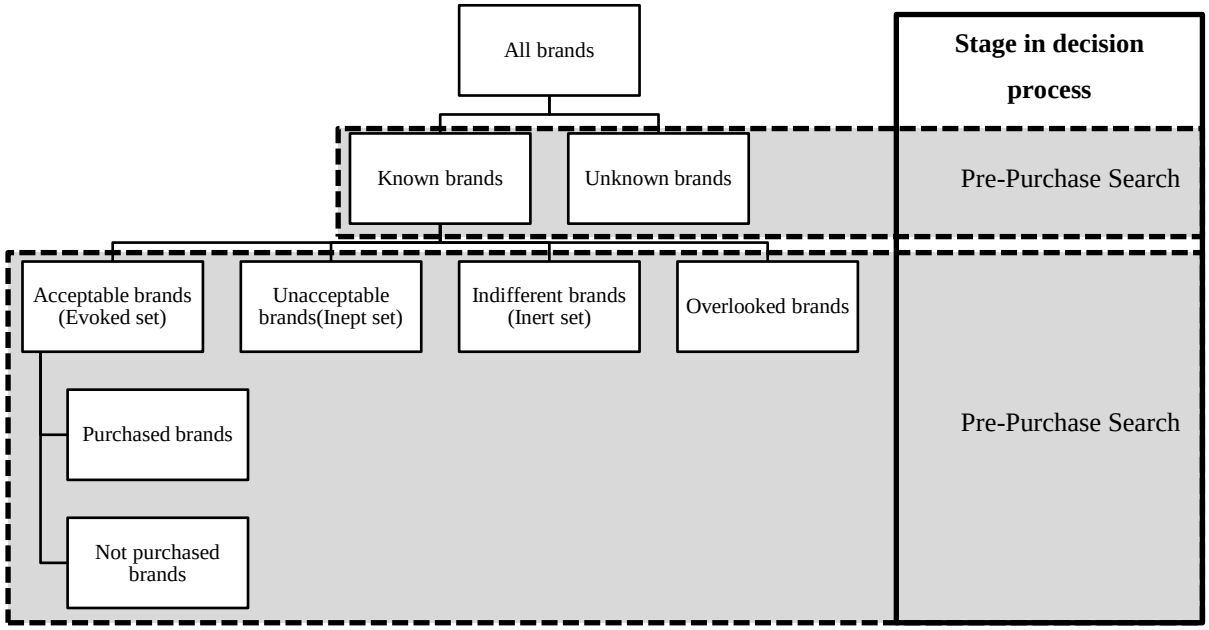

Figure 7 (Schiffman, Kanuk and Hansen, 2008).

Figure 7 categorizes all possible alternatives/brands according to the reasons if and why a brand is considered, or not considered. First, a brand needs to be known in order to be considered. This stage is related to the previous section about pre-purchase information search. Second, a brand must be perceived as acceptable for the individual customer in order to be considered. There are three major reasons for why a known brand is not regarded as acceptable. First, unacceptable brands are brands associated by unattractive attributes, e.g. poor quality. Brands are positioned by product characteristics and advertising in order to attract different kinds of consumer segments. A consumer is likely to consider a brand as

unacceptable if it doesn't belong to that target segment. Second, even though a brand isn't associated with any unacceptable characteristics, it is not enough to be considered. Consumers don't consider indifferent brands since they lack any kind of special benefit. Third, a brand might be overlooked since it is not positioned or targeted clearly enough in the market places which makes it hard for consumers to understand the benefits of a brand (Schiffman, Kanuk and Hansen, 2008).

Acceptable brands are the brands that the consumer actually considers; they are included in the consumer's *evoked set*. Research has shown that the number of brands in the evoked set is quite small, often three to five brands in each product category in each product category. The size of the evoked set is often larger for consumers with previous experience in the specific product group (Schiffman, Kanuk and Hansen, 2008).

How Consumers Evaluate Alternatives on PCA Sites

The following part will discuss the possible criteria consumers use when evaluating retailers in PCA sites. According to micro economic research dominating in this research field, consumers base their decisions solely on price in a market for homogeneous goods (Ivey and Pazgal, 2003). When the search costs decreases, price dispersion should be eliminated. However, empirical research has discovered significant price dispersion for homogenous goods in electronic markets (see section 2.7). This means that sellers still find ways to charge more than marginal cost. The possibility to charge higher than competitors should be appealing for many retailers. The following section will discuss the different criteria consumers' value when selecting retailers on a PCA. By understanding why consumers select retailers with price premiums in PCA sites, retailers can enforce these factors in order to sustain/increase prices and increase profits.

Before discussing the different factors that make consumers select other alternatives than the cheapest offer, let's not forget that price still matters. The fact that consumers don't solely base their decisions on the price criteria doesn't mean that price doesn't matter. In fact, price is the most important criteria when consumers evaluate alternatives online (Smith and Brynjolfsson, 2001, Elisson and Elisson, 2004). The price sensitivity is believed to increase when the search costs for price information is decreased (Elisson and Elisson, 2004, Alba et. al., 1997). However, Lynch and Ariely (1999) argue that price sensitivity can be reduced by reduced search costs for quality features, which on the contrary makes more consumers select high quality products rather than the cheapest products. Differences in product quality do not

exist in commoditized markets with homogenous products, but as discussed later, different offerings can differ regarding other dimensions.

Smith and Brynjolfsson (2001) compared the price sensitivity of frequent PCA site visitors with less frequent visitor. Surprisingly, the frequent visitors was less price sensitive, and put more emphasis on brands and service quality**.** This contradicts the assumption that the emergence of PCAs automatically lead to increased price sensitivity.

Differentiation in Commoditized Markets

An assumption of the predictions of perfect markets and the law of one price was homogenous products. This means that the customer knows that the benefit will become the same regardless of which seller they choice (Iver and Pazgal, 2003). This assumption seems reasonable in many retailing industries were all retailers sell the same kind of products produced by the same manufacturers, like books and CDs, or consumer electronics. In these kinds of markets, price should be the only factor that matters in consumer decision making. However, it seems like the reality is a little bit more complex than that. Even in markets of commoditized goods, buyers value sellers differently which is a source of price dispersion. Even though the good by itself might be the same, there are other factors providing additional value for consumers. Retailers can differentiate vertically, which means doing the same thing (supplying the same good) *better* than competitor, which is different from making different things (Dinleroz and Li, 2006). The following part will explain in what dimensions seller's offers are valuated differently by consumers even though they are supplying the same product.

Trust

In this thesis, the concept of trust is delimited to the different antecedents of trust visible in a PCA site that influence the consumers to select a retailer. A wider perspective on trust, not considered in this thesis, would be how the consumer later perceives the retailer website after been directed from the PCA site. From this perspective, it is known that factors such as website design, visual factors and perceived ease of use plays an important role (Gefen et. al., 2003, Stanford et al, 2002). The factors influencing the trust of a retailer and are visible in a PCA site are factors like brands, reputation, partnership with the PCA and nationality.

Brands

The credibility of a brand increases the probability of the brand to be included in the evoked set, as well as the probability of being chosen. Brand credibility has two major components,

trustworthiness and *expertise.* As illustrated in Figure 8, there are three major reasons of why brand credibility matters. Information costs saved has already been discussed in search cost part in this paper, but there are two additional factors; service quality and perceived risk (Erdem and Swait, 2004).

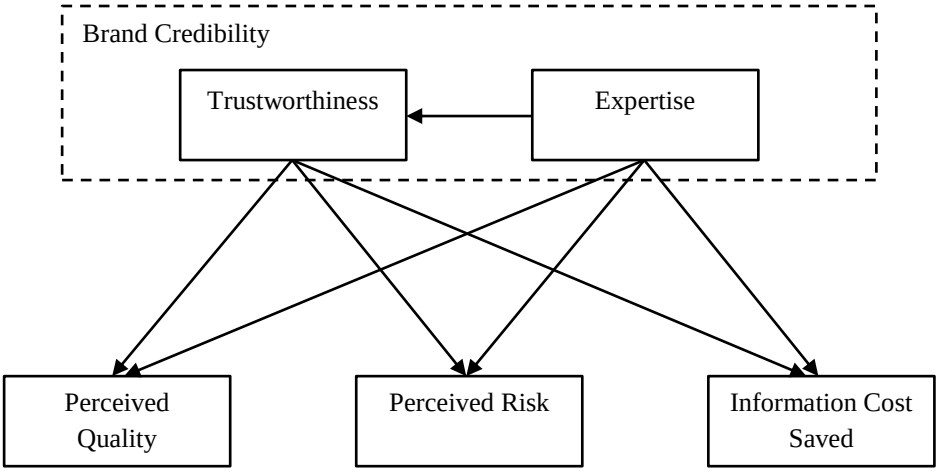

Figure 8 (Erdem and Swait, 2004)

The perceived quality is also discussed by Smith and Brynjolfsson (2001). At the time of their study, three major players dominated the e-market of books in the U.S., and the most dominant one was Amazon.com. The results show that customers to a large extent prefer offers from the large three retailers, a suggesting that brands are very important. An offer from the big three retailers had a $1.72 price advantage compared to the generic retailers. Amazon had a $2.49 price advantage over the generic retailers and a $1.30 advantage over the two other dominate retailers. The authors argue that the reason for the importance of brands is that customers use brands as a proxy for their credibility in fulfilling promises (Wernerfelt, 1988). This means that customers believe that retailers with a well-known brand to a larger extent fulfill their promises regarding service quality such as delivery time, and also that they have a simpler ordering process. This argument is also supported by the fact that customers who cared more about delivery time also were more attracted to the three dominating brands.

The perceived risks are traditionally associated with functional, physical, financial, social, psychological and time risk (Keller, 2008). Most of these risks are product-specific, and not relevant when comparing different retailers of homogenous products. In the case of retailer brand in a PCA site, the perceived risks are more about the risk of opportunistic behavior as discussed earlier in the basic functions of a market (Section 2.4). Fraud and bankruptcy might lead to the consumer losing their money, and this risk is perceived lower when dealing with a well-known seller. The importance of quality and risk is more important for high involvement

products. This explains the relationship between the importance of brands and the level of involvement (Bart et. al., 2005). This suggests that customers should be willing to pay a premium when choosing a retailer with a well-known brand.

H5: There is a positive relationship between brand awareness and price on PCA sites.

Reputation

In addition to brands, there is also another important indicator of the trustworthiness of a retailer. In almost all PCA sites, there are opportunities for customers to write comments and grade retailers. This is referred to as reputation, and there are several studies that reputation does affect customer's choices. For example, a large share of customers (72%) can imagine themselves buying from a completely unknown seller if the retailer got a good online reputation; a grade exceeding 4 out of 5 *stars* (Ong, 2011). There is also empirical evidence that good online reputation got a monetary value, that retailers can enjoy price premiums compared to sellers with lower reputation. Lou and Chung (2010) investigated the relationship between reputation and prices on a PCA site. The results were that sellers with higher reputation also had higher prices. It also seems like the advantage of price premium increased for expensive products. This is explained by the fact that customers perceive higher risk when buying expensive products, and that this risk is minimized by selecting a seller with good reputation.

H6: There is a positive relationship between retailer´s reputation and price on PCA sites.

Another trust indicator visible for consumers on PCA sites is the number of ratings. The number of ratings should be related to trust since it shows the number of opinions that the average grade is based on. If the average grade is based upon a large number of consumer experiences, this grade should be valuable higher than the same mean grade based upon just a few customers' experiences.

H7: There is a positive relationship between the number of ratings and price.

As discussed in section 2.3, there are indications that sellers who partner up with a PCA got higher average ratings. This is because PCAs implement systems that facilitate the gathering of ratings from customers, for example by sending an email to customers after a transaction has been made. These systems are only available when the seller pays commission to the PCA, and an agreement is established. This is assumed to increase the average rating since it is generally mostly dissatisfied customers who take the initiative to rate, which makes the

average ratings quite low for retailers where this system is missing. In order to provide extra value to paying sellers, there are also indications that PCA's manipulates grades of partner sellers, which also should result in that sellers who cooperate with PCAs got a higher average rating.

H8a: There is a positive relationship between the number of ratings and the average rating.

As discussed in section 2.3, some PCAs have developed systems for retrieving a larger number of comments and grades from consumers. These systems are only open to paying sellers and will generate a higher number of comments and grades for them. This system is assumed to provide a higher average rating since it facilitates people to rate, and neutralize the fact that it is mostly unsatisfied customers who generally take the initiative to rate, which bias the grading. Some PCA sites might also manipulate the grading in order to provide extra value for their paying customers.

H8b: Retailers that are partners with a PCA have a higher average rating.

Ratings derive from consumer experiences, but there are also third party recommendation systems available at some PCAs. At Prisjakt for example, consumers can get information regarding recommendations from manufacturers. If a well-known and trustworthy manufacturer recommends a retailer, this trustworthiness might be transferred to the retailer. Since consumers are assumed to value low risk, the consumer is assumed to be willing to pay a premium and to these retailers compared to retailers who are not recommended by manufacturers.

H9: There is a positive relationship between the number of recommendations from manufacturers and price.

Partnership with PCA

A factor not considered in previous research is the fact that the list of offerings provided by PCAs isn't completely objective. The list is biased in order to favoring those sellers that have an agreement with, and generate revenues to, the PCA. In order for PCAs to get revenues, the need to offer some additional value to the sellers providing them with commission compared to the non-paying free riding sellers. Examples of such additional value are hyperlinks to the seller's website, displaying of logotype, additional seller information, increased accuracy of price information, and a possibility of higher grades (Prisjakt, 2012). When a hyperlink is missing, a buyer needs to find the seller through a regular search engine like Google. This is

associated with higher search costs which can be exploited by other sellers and thereby by a source of price dispersion. The displaying of logotype will make it easier for consumers to recognize brands which are a source of price dispersion as well. In addition to brands, extensive information about the seller will decrease the perceive risk associated with buying from the seller. Even though a seller is the cheapest one, some consumers will not select that one simply because the find it risky if they cannot find any information about that seller. They might be willing to pay some in order to feel safe and select a seller perceived as more serious since there is lots of information available about the seller. All this would result in that retailers with partnerships with PCAs are able to charge a premium compared to other retailers. These arguments therefore reinforce hypothesis H2, that retailers with a direct link (and therefore are partners with the PCA) charge higher prices.

Nationality

Some PCAs also include international retailers that offer shipping to Sweden. Previous research shows that country of origin does have an impact on consumer's preferences regarding quality and the willingness of buying a product (e.g. Usunier, 2006). Even though this research focuses on the country a product was manufactured, the origin of a retailer may have the same effect. Swedish consumers are familiar with Swedish retailers, and international retailers are probably associated as a higher perceived risk. It is reasonable to believe that an international retailer must be cheaper in order for a Swedish consumer to consider that option, if there is a Swedish retailer offering the same product. It is also likely that an international retailer offer longer delivery times, which also should be compensated with a lower price.

H10: International sellers have lower prices than national retailers on PCA sites.

4.3. Summary of Hypotheses

All the hypotheses derived from the theoretical discussion are listed below.

H1: Retailers with unknown brands are more likely to partner up with PCAs compared to retailers with well-known brands.

H2: Retailers with a direct link to their website charge higher prices.

H3: There is a negative relationship between the degree of involvement and price dispersion.

H4: Sellers who have physical stores charge higher prices.

H5: There is a positive relationship between brand awareness and price.

H6: There is a positive relationship between retailer´s reputation and price on PCA sites.

H7: There is a positive relationship between the number of ratings and price.

H8a: There is a positive relationship between the number of ratings and the average rating.

H8b: Retailers with partnership with a PCA have a higher average rating.

H9: There is a positive relationship between the number of recommendations from manufacturers and price.

H10: International sellers have lower prices than national retailers on PCA sites.

5. METHODOLOGY

The following section will describe how the hypotheses are tested. This is a quantitative study, and the hypotheses are tested by using data from the most popular products listed on one of the largest PCAs in Sweden; Prisjakt.se. Last, the variables will be defined, and a regression model introduced.

5.1. Data Source; Prisjakt.se

There are two major PCAs for consumer electronics in Sweden. When comparing the net sales for 2010, Pricerunner was the largest one with a turn-over reaching 60 MSEK, compared to 53 MSEK for the second largest; Prisjakt. However, Prisjakt is a new actor growing rapidly, while Pricerunner's market share on the other hand has been decreasing. If the trend has sustained during 2011, Prisjakt would now be Sweden's largest PCA for consumer electronics. This was one of the reasons why Prisjakt was chosen as the primary data source for this study. Another reason for choosing Prisjakt was that it was much easier to retrieve data from their website.

Prisjakt aggregates offerings from a wide range of product categories. Table 1 shows the number of indexed products in each product category. Flight tickets and other services are not included in Table 1 due to the complex nature of these offerings. *Indexed products* mean that the product has been categorized by Prisjakt and therefore possible for the consumer to find by browsing in product lists. The reason why a product is not indexed is that that it could take some time for new products to be categorized or because the product category is not prioritized by Prisjakt. Products that are not indexed can still in the service Prisjakt Expert. The total number of retailers offering these products was 3462 (Prisjakt, 2012).

Products Indexed on Prisjakt.se	
Product category	**Indexed Products**
Movies and books	577 278
Lifestyle and beauty	112 012
Home and family	81 155
Audio and video	49 992
Sports	44 215
Computers and computer parts	31 312
Games and gaming consoles	25 636
Photography and video recording	6 275
Phones and GPS devices	1 694
Sum	*929 569*

Table 1

5.2. Sampling

As shown in Table 1, there were almost one million indexed product offerings at Prisjakt at this time. It was not possible, or even necessary, to include them all in this survey. The purpose of this study is to investigate the market of consumer electronics, which excludes a large majority of the products.

One alternative for selecting which offerings to include in the sample is to do a random sample where all product offerings have the same probability to be included (Newbold, 2009). This alternative was dismissed since it wouldn't provide a sample representative for the market. Some products count for a very large share of all market transactions, while some products are bought rarely. The purpose of the sampling is to select products that represent as large part of the market as possible. For this reason, the 100 most popular products were chosen as a sample for this study. Popular in this case is determined by the number of consumer searches (Prisjakt, 2012).

There are products from 30 product categories. Mobile phones and computer tablets are the most frequent categories. The eight products belonging to any of the product categories *shoes/sneakers, coffeemakers, kitchen devices, sunglasses, baby carriages and barbeque grills* were excluded since they are not considered as consumer electronics. The final sample therefore included 92 products. A list of the 92 products can be found in Appendix 2.

In order to get an overview of the sample and this study, it is important to understand the difference between products, product offerings and retailers. The sample contains of 92 different products, but since all products are sold by multiple retailers, the number of product offerings is 4806. This means that each of the 92 products was offered by 52 retailers in average. However, many of the retailers offered several of the 92 products, and the number of unique retailers for the 4806 product offerings were 357.

Sample Overview	
Number of products	92
Number of product offerings	4 806
Number of retailers	357

Table 2

107 of the offerings listed on Prisjakt were not available for ordering online. These offerings refer to the retailer's brick-and-mortar stores, and are therefore excluded in the sample. Another criterion for the sample is that the product has to be new and not being used or having any kind of defects, a criteria excluding 46 offerings more. The remaining number of offerings included in the sample was 4806.

Offerings are listed on Prisjakt.se even though they are not in stock. There are basically three different statuses for stock availability for each offering; *In stock, Not in stock* or *Available in [Date]*. This information was not considered in this study, even though this information might affect the pricing since a consumer should be willing to pay some extra for receiving the delivery earlier. All offerings were included in the sample no matter of the availability status. The major reason for this decision was that the data couldn't be retrieved in a reasonable amount of time (it had to be manually collected for each of the 4806 offerings). In order to test the importance of this information, a sample including nine of the most popular products were examined more closely. The result showed no statistically significant correlation between the availability variable and the price premium (%) variable. For this reason, it was decided to not gather information regarding availability for the remaining 82 products. Further details of this pre-test can be found in appendix 3. The reason why the availability information wasn't correlated with the price premium is probably because a product is only out of stock for a limited period of time. The conclusion is that even though a consumer probably is willing to pay extra for an offering when the product is in stock, the availability factor seems randomly distributed and there are no indications that the offerings with the product in stock are related to higher prices.

5.3. Data Collection

All the offering specific data were collected the 4th of April 2012 by downloading the webpages containing the information of the 92 most popular products and the related offerings. The information regarding 357 retailers was gathered the 9-10th of April 2012. The fact that the retailing-specific variables were collected a couple of days later than the prices and for a longer period of time is not considered an issue since these variable by nature are very stable and doesn't change that frequently (all the variables are defined in the next section).

All the information from the webpages was later copied into Excel, where the important variables were separated from irrelevant text through manual work.

5.4. Definition of Variables

The following section will describe the variables used in order to test the hypotheses. Some variables are offering specific, while others are retailer specific. A variable is offering specific when it contains a unique value for each product offering. All kinds of pricing information are offering specific. Retailer specific variables on the other hand are not unique for each offering

since retailers can offer several 92 products. The retailer specific variables are unique for each retailer, and are therefore the same for all product offerings offered by the same retailer.

Offering Specific variables

ID	Name	Definition
A	*Price*	The price in SEK for a product offering excluding the cost of shipping on Prisjakt.se the 4th of April 2012. The reason for not including the shipping is first that this information was not available for a large proportion of the offerings which would undermine the quality of the analysis. Second, the shipping costs are not calculated according to any standards; it varies depending on factors like the order value. By increasing the order value (by for example buying an additional quantity of an items will in some cases reduce or increase the shipping cost. Although the shipping costs might influence consumer decision-making, this factor was not possible to consider in this study.
B	*Price premium [SEK]*	The price premium is the price in SEK of a product offering (*variable A*) subtracted with the lowest price offered by any retailer for that particular product.
C	*Price premium [%]*	The price premium in SEK (*variable B*) is not a good measure when comparing different products in different price ranges. In order to make the price premium comparable between products, the price premium is measured as a proportion of the minimum price offered by any retailer for that specific product. In other words; *Variable A* divided by the minimum price offered for that specific product.

Table 3

Independent Variables – Seller Specific

ID	Name	Definition
D	*Partnership*	Dummy variable that equals 1 if there is a direct link from PCA site (Prisjakt.se) to the retailer's web site. Direct links are only available for those retailers who have an agreement with Prisjakt (Prisjakt, 2012).
E	*Physical stores*	The number of physical stores a retailer possess in addition to the web

		shop. This information was available at Prisjakt.se.
F	*Brand Equity*	A dummy variable that equals 1 if the company's annual turn-over for 2010 exceeded 200 MSEK, otherwise 0. Measuring brand awareness for 357 different retailers would be a complex task. In this study, the net sales of a company are used as a proxy for brand equity. Although it is possible for large companies have weak brands, and small companies to have well-known brands, it is no question about the fact that in general, large companies do have more well-known brands than smaller companies (Sharp, 2010). This kind of proxy has been used previously in similar research. Smith and Brynjolfsson (2001) used a similar dummy variable to distinguish three dominate internet retailers of books in the United States. The results showed a significant correlation between this dummy variable and web traffic. A complete list of the 24 companies exceeding 200 MSEK in net sales is found in Appendix 4. The reason for dividing the retailers at 200 MSEK in turn-over is based upon the fact that consumers tend to remember just a few brands in each product category (Johnson et. al., 2004), and the 24 largest retailers is therefore assumed to cover a large proportion of the retailers that is known to most people.
G	*Reputation (Average)*	The P2P rating visible to consumers on Prisjakt.se. Ranges from 1-10 *stars.* Some stores do not have enough ratings in order to get an average score. There are several alternatives of how to deal with those retailers. First, these retailers could be excluded from the study. However, this would decrease the sample and reduce the quality of the analysis. The second alternative, which was chosen in this analysis, was to approximate the missing value with an average grade. It is reasonable to believe that customers value a missing grade higher than a very poor grade. Most people would probably choose a retailer with a missing rating since the probability being satisfied by an unknown seller is

		higher than the probability of being satisfied with a very poor-rated seller. The effect of the missing values can be controlled by the variable H; Reputation (No).
H	*Reputation (No)*	The number of P2P ratings a retailer got on Prisjakt.se.
I	*Manufacturer recommendation*	The number of manufactures that recommend a retailer on Prisjakt.se.
J	*Nationality*	Dummy variable: Equals 1 if the store is based in Sweden, otherwise 0. Prisjakt.se was used as data source.
K	*Offerings*	The number of different products a retailer offers which are indexed by Prisjakt.se. *Indexed* means that the product is categorized by Prisjakt.se and therefore comparable against other retailers.

Table 4

5.5. Research Credibility

Reliability

Reliability refers to the extent of consistency, that the results will be the same if the data were collected a repeated number of times (Bryman and Bell, 2005). The level of reliability is high, and there are no risk of biases regarding interpretations or similar. The risk of typing errors etc. is also low since most of the data was copied automatically.

One variable that varies over time is the prices. Some retailers change prices very frequently in order to adjust according to competitors. The data reflects the price level at the moment when the data was collected, and the price level will of course change over time.

Validity

Validity referees to what extent the data really measure what is intended to be measured (Bryman and Bell, 2005). Most of the variables are easy to measure and are available directly from the Prisjakt data base, such as the number of brick-and-mortar stores, the number of ratings, the average rating, nationality, number of recommendations from manufacturers and the number of indexed products. All these variables have very high level of validity.

There are two variables where validity issues are a bit more complex; the price variable and the brand awareness variable. In order to discuss the pricing variable, let's take H2 as an

example. H2 states that retailers which have a direct link to their web shop should charge a higher price since the perceived search cost for the consumer is lower compared to retailers without this direct link. In other words, this means that a retailer with a direct link can charge a higher price and still sell the same volumes as retailers missing this link. However, just measuring the price is just an approximation. Just because a retailer charges a 100% price premium, it doesn't mean that customer actually value this offer the double, and are willing to pay for it. This means that there might be a lot of offers listed on Prisjakt that due to over-pricing are never selected by customers. In previous research, this issue has been solved when using some kind of volume measure, like the number of click-through for example. That kind of data was not available for this study. However, the price should be a good approximation of what customers are willing to pay, since a rational retailer should lower prices if the products aren't sold.

Measuring any brand related features such as brand equity or brand awareness is also a tricky issue. As discussed in the previous section, the net sales of the company where used as a proxy for brand awareness. Although the correlation between net sales and brand equity and awareness probably are quite high, it is still not a perfect measure. There are probably lots of examples both where a large company got poor brands and small companies having strong brands. However, a detailed study of the 357 retailers included in this study would have been way beyond the scope of this thesis and using the net sales as a proxy is considered good enough. The proxy has also been used in previous research by Smith and Brynjolfsson (2001).

External validity is about to what extent the results of the study can be generalized to a larger population (in this case a larger market). From a strictly statistical perspective, there should be a random sample in order to generalize results from a study (Newbold, 2009). The sample in this study was not randomly selected, as discussed in the section 5.2. The sample includes the most popular products, and the results shouldn't be generalized to other products which are sold at much lower volumes. Since the sample only includes consumer electronics products, the results shouldn't be generalized to other product groups either. It should be possible to generalize the results to similar PCAs, like Pricerunner for example since the products and variables to large extent are the same since they steam from the same sources (the retailers themselves).

5.6. Regression Model

In total, there are ten hypotheses in these theses. Seven out of these cover different factors that are expected to influence the price of product offerings. In order to analyze to what extent all

these factors influence prices, multiple regression is used. The regression model is summarized in Table 5. The dependent variable in the model is price premium (%); *Variable C*. Each independent variable relate to one of the hypothesis. Variable K is a control variable also included in the regression model, and is the number of indexed products a seller offer. The purpose of this model is neutralizing the effects of economies of scale. Sellers having a large number of products for sale are assumed to be able to charge less, since their fixed costs are divided among a larger product base.

Regression Model	
Dependent variable	
C Price Premium (%)	
Independent variables	**Hypothesis**
D Partnership	H2
E Physical Equity	H4
F Brand awareness	H5
G Reputation (Mean) (*=5)	H6
H Reputation (No)	H7
I Manufacturer recommendation	H9
J Nationality	H10
K Offerings	Control variable

Table 5

The regression analysis is made in two steps. First, a simple regression analysis is made with each single independent variable. If there is no significant correlation between the single independent variable and the dependent variable, the related hypothesis will be rejected and the independent variable will not be included in the regression model. If there is a significant correlation between the independent variable and price premium, the variable will be included in the final regression model including several independent variables. In the final model, the effect of each independent variable on the price premium will be analyzed by observing the beta coefficient in the regression equation. The statistical significance will be analyzed by regular t-statics and p-values. The hypothesis are accepted if the p-value <0.05, which means that the beta coefficient of the independent variable very likely differ from 0 (no correlation at all).

5.7. Correlations and Multicollinearity

Multicollinearity is a common obstacle in regression models with multiple independent variables. Multicollinearity means that the independent variables are highly correlated with each other which make it hard to distinguish their effect on the dependent variable separately (Newbold, 2009).

	Partnership	Brand Equity	Reputation (No)	Reputation (Mean)	Physical stores	Manufacturer recommendation
Brand Equity	**0,44**					
	0,00					
Reputation (No)	**0,39**	**0,56**				
	0,00	*0,00*				
Reputation (Mean)	**0,57**	0,23	**0,39**			
	0,00	*0,00*	*0,00*			
Physical stores	0,20	**0,41**	0,11	0,10		
	0,00	*0,00*	*0,00*	*0,00*		
Manufacturer recommendation	**0,49**	**0,70**	**0,74**	**0,47**	0,25	
	0,00	*0,00*	*0,00*	*0,00*	*0,00*	
Offerings	-0,15	0,07	0,19	-0,06	-0,11	0,06
	0,00	*0,00*	*0,00*	*0,00*	*0,00*	*0,00*

Table 6

Pearson's correlation coefficient. Bold when >-0.3 or <-0.3. Underlined when >-0.5 or <-0.5. P-values within brackets.

Table 6 shows the Pearson correlation coefficient between all the independent variables used in the regression model. Although most of the correlations are significant, they are quite small (a large majority falls below 0.3). Four of the correlation coefficient exceeds a value of 0.5. In order to understand if these correlations causes problem or not, the *Variance Inflation Factor (VIP)* is calculated for each of the variables in the regression model. The variance inflation factor measure how much of the variance of the estimated regression coefficients that are inflated compared to when the variables are not linearly related (Minitab, 2011). As shown in Table 7, the VIP ranges from 1.14 to 3.28. These correlations are only moderate, and way below 10 which is a general rule of thumb when multicollinearity really becomes problematic. Hence, multicollinearity is not considered as a problem in this regression model.

Variable	**VIF**
Partnership	1,905
Brand Equity	2,376
Reputation (No)	2,373
Reputation (Mean)	1,659
Physical stores	1,262
Manufacturer recommendation	3,279
Offers	1,141

Table 7

6. DATA AND DESCRIPTIVE STATISTICS

Independent variables; Prices and Price Premiums

Variable	N	N*	Mean	StDev	Min	Q1	Median	Q3	Max
A Price	4 806	0	5 023	5 115	219	2 190	4 184	5 735	38 521
B Price Premium (SEK)	4 806	0	863	934	0	237	623	1 179	14 815
C Price Premium (%)	4 806	0	28,1%	24,6%	0,0%	11,4%	22,3%	37,7%	242,4%

Table 8

Table 8 shows descriptive statistics for the 4806 offerings. Variable C is used in the regression model, and variable A and C are used to calculate variable C. The statistics shown above is hard to interpret since the mean etc. are weighted by the number of offerings for each product. This problem is solved by calculating a mean of the three variables for each of the products. The results are shown in Table 9. It shows that the average product was sold at a price of 5473 SEK excluding shipping, ranging from 323 and 32172 SEK. The price premium in SEK was 918 SEK on average, ranging from 56 to 3948 SEK. The price premium as a percentage of the minimum price for each product was 27.45 % on average, ranging from 0.94% and 122.56%. The single missing value for the price premium variable is simply a product which was sold by one single retailer.

Variable	N	N*	Mean	StDev	Min	Q1	Median	Q3	Max
Price (Mean)	92	0	5473	5410	326	2348	4364	6228	32172
Price premium (SEK) (Mean)	91	1	918,4	761,7	56,3	406,4	684,2	1167,3	3948,7
Price premium (%) (Mean)	91	1	27,45%	18,36%	0,94%	16,06%	22,14%	34,55%	122,56%

Table 9

Dependent variables; Retailer Characteristics

Variable	N	N*	Mean	StDev	Min	Q1	Median	Q3	Max
Reputation (No)	356	1	292	1 199	0	1	9	82	12 342
Reputation (Mean)	249	108	7,3	1,9	1,2	6,5	7,7	8,8	9,7
Physical stores	356	1	3	13	0	0	1	1	165
Manufacturer recommendation	356	1	1	3	0	0	0	1	20
Offers	356	1	5 215	12 793	2	169	773	3 347	138 325

Dummy variables	N	N*	=1	=0	%=1
Partnership	357	0	179	178	50%
Brand Equity	357	0	24	333	7%
Nationality	357	0	346	11	97%

Table 10

Ratings

In total, there were 103,784 unique ratings by consumers in the sample, which makes it 292 ratings per retailer. The number of ratings is quite unequally distributed; Q3 shows that ¾ of the retailers got less than 82 ratings, which means that there are a limited number of retailers with a very large number of ratings.

The average rating was calculated for 249 of the retailers, since 108 of the retailers didn't have enough votes in order to get an average grade (these missing values will be approximated with 5 in the regression analysis). The mean rating was 7.3 *stars* out of 10 possible, with a standard deviation of 1.9.

Number of physical stores

172 of the stores (48%) of the retailers were a pure web shops without any brick-and-mortar stores. Expert had 165 stores, which was largest number for this variable. Expert is an exception however, only 12 of the 357 retailer had more than 10 stores in addition to the web shop.

Recommendations from Manufacturers

109 of the 357 retailers were recommended by at least one manufacturer. The number of recommendations from manufactures is unequally distributed with a small share of the retailers having a larger number of recommendations.

Offers

As shown in table, the average number of indexed products was 5215 products per store. However, most retailers had much smaller assortment. The standard deviation was 12 793 and the third quartile shows that ¾ of the retailer's assortment listed on Prisjakt fell below 3347 products. The retailer with the largest assortment listed was CDON with 138,325 indexed products in total.

Partnership

179 (50%) of the retailers had a direct link on the Prisjakt website to their own web shop, and hence had an agreement with Prisjakt.

Brand Awareness

As explained in the methodology section, 24 of the retailers where categorized as having strong brands according to their net sales.

Nationality

346 of the retailers, (97%) of the retailers selling any of the 92 products in the sample were based in Sweden. 11 (3%) of the retailers where based outside Sweden.

7. ANALYSIS

7.1. Simple Regression Analysis

The first step in the regression analysis is a pre-test were the dependent variable *price premium (%)* is tested with each of the independent variables separately. The result is presented in Table 11 and shows that all variables except for one have a statistically significant correlation on the price premium. The nationality variable on the other hand got a p-value of 0.18, which exceeds the significance level of α=0.05. This means that this variable will be excluded in the following regression model where all variables are tested together.

	β Coef	**SE Coef**	**T**	**P**	**R2(adj)**
Partnership	-0,1568	0,0067	-23,34	**0,00**	10,20%
Brand Equity	-0,1164	0,0096	-12,12	**0,00**	2,90%
Nationality	0,0188	0,0141	1,34	0,18	0,00%
Reputation (No)	0,0000	0,0000	-13,31	**0,00**	3,60%
Reputation (Mean) (*=5)	-0,0322	-0,0322	-18,49	**0,00**	6,70%
Physical stores	-0,0010	0,0002	-4,61	**0,00**	0,40%
Manufacturer recommendation	-0,0139	0,0007	-18,96	**0,00**	7,10%
Offers	0,0000	0,0000	2,12	**0,03**	0,10%

Table 11

7.2. Multiple Regression Analysis

Predictor	**β Coef**	**SE Coef**	**T**	**P**	
Constant	0,4109	0,0133	30,86	0,00	
Partnership	-0,1132	0,0090	-12,53	0,00	*
Brand Equity	0,0325	0,0144	2,26	0,02	*
Reputation (No)	0,0000	0,0000	1,47	0,14	
Reputation (Mean) (*=5)	-0,0086	0,0022	-3,89	0,00	*
Physical stores	0,0001	0,0002	0,40	0,69	
Manufacturer recommendation	-0,0093	0,0013	-7,12	0,00	*
Offerings	0,0000	0,0000	-0,37	0,71	

S	0,230516
R-Sq	12,50%
R-Sq(adj)	12,40%
N	4716
N*	90

Table 12

The Model in General

Table 12 shows the regression model including all seven of the independent variable. The result shows there is a statistically significant correlation for four out of the seven variables. There was no significant correlation between the control variable *Offerings* and the dependent variable, meaning that the product size of the assortment didn't have any significant relationship with the price level.

One should notice the adjusted coefficient of determination (R^2-adj) of 12.4%. This means that the seven independent variables in the model explain 12.4% of the variation of the dependent variable *price premium (%). Adjusted* in this case means that the value is adjusted according to the number of independent variables. This makes it possible to compare with other models with a different number of independent variables (Newbold, 2009). This means that the model cannot be used to predict a price level by just entering the independent variables in the model. However, this was not the intention either. The purpose of the model is to find correlations between the independent variables and the price premium, and not to provide an overall understanding of all possible factors that influence a seller's pricing strategy.

The beta coefficients might seem small in absolute numbers, but this is because the dependent variable is the price premium in percentage of the minimum price for each product. For calculating the relationship in absolute numbers for the hypothesis below, Table 8 was used. The table shows that the mean price premium in SEK for all offerings in the sample was 863 SEK, which was 28.1% of the minimum prices for each product. This means that one percentage point of the beta coefficients (0.01) equals 30.71 SEK in absolute numbers [863/28.1]. This is how the coefficients are interpreted and calculated into absolute numbers in the following section.

7.3. Hypothesis Testing

H1: Retailers with unknown brands are more likely to partner up with PCAs compared to retailers with well-known brands.	***NOT SUPPPORTED***

Out of the 24 retailers with well-known brands, 23 had direct links to their web shops (96%). Out of the 333 retailers with less known brands, 156 (47%) had this link. This means that H1 is not supported since a larger proportion of the retailers with well-known brands had an agreement with Prisjakt compared to the retailers with less known brands, which contradicts the hypothesis.

One possible explanation to this result might be linked to the value that PCAs offers to the consumers. The purpose of a PCA is to aggregate information to facilitate decision making by making the process as convenient and fast as possible. The value of this service for consumers would probably be much lower if links to the largest and most well-known sellers are missing. Another reason why PCAs should be very keen on partnering up with the largest sellers is that

they are the source of the largest revenues. Revenues are to a large extent related to the sales volume. For these reasons, the PCAs are probably very keen to partner up with the largest actors, and might offer them better deals in order to get an agreement. This fact might neutralize the fact that smaller actors in theory should gain more for participating on a PCA site, and therefore explain why H1 was not supported in this dataset.

H2: Retailers with a direct link to their website charge higher prices	***NOT SUPPPORTED***

As discussed in section 4.1, PCAs decrease the external search cost when searching for alternative sellers and offerings. The search cost should affect the price, since what matters for a rational consumer is the total cost, which makes it possible for a low search cost to compensate for a higher price. According to H2, the retailers with a direct link to their web shop were assumed to be able to charge some extra because of the low search cost. When a link is present, the web shop is only *one click away* compared to when no link is present and the consumer has to find the retailers web site by using a regular search engine. In addition to the direct link, there are also other kinds of benefits related to a partnership with a PCA explained in section 2.3. Examples are the display of a logotype as an image, which would improve brand recognition and trust. Partners are also allowed to add some additional information about their company (called *Additional Value)* where they can argue why their offer is better than the competing offers. A partnership also enables more accurate price information since the price information is updated several times a day through a price file compared to a less accurate *Spider* software that automatically scan the internet in order to retrieve information. The last example is that the partnership would lead to a larger number of grades because of automatic systems for rating gatherings only available for partners. Since a large number of ratings is relate to a higher average rating (discussed in section 2.3), and a high average rating should be also be related to a larger possibility to charge a price premium. The positive relationship between the number of grades and the average rating is verified in this study and further discussed in the section related to hypothesis H8a.

Surprisingly, as shown in Table 12, the regression analysis shows a significant relationship between the presence of a link and the price premium is negative. The beta coefficient of -0.1132 indicates that the retailers in the sample with a direct link on average charged a price premium of 11.32 percentage points less (348 SEK) than the retailers who didn't have any partnership with the PCA and therefore were missing a direct link.

The reason for this empirical finding might be that retailers associate PCAs market places with an extensive price focus, which by itself isn't that surprising. A large part of the value offered towards consumers is based on how they help consumers making bargains and find better offers. Offers are for example by default listed sorted based on price, and the position in the listing is very important (Smith and Brynjolfsson, 2001). From this perspective, PCAs are not a very friendly market actor from a seller's point of view since their services decrease retailer profits and re-allocate surpluses from the sellers to the customers by increasing the bargain power of consumers. This isn't very appealing for retailers who are not cost-focused, but have chosen to differentiate and focus on price etc. However, retailer's doesn't lose anything from participating either since the cost of the partnerships is based solely on the transaction volume, meaning that the cost will be low if the benefit of the agreement is low. Price focused retailers on the other hand has a lot to benefit from partnering up with a PCA, since the listing on a PCA highlights their most important competitive advantage. All this might explain the negative relationship between the presence of a direct link and price. The causality is probably the opposite compared to H2; retailers with low prices are keener on cooperating with PCAs compared to more differentiated retailers. This factor seems to neutralize and over-compensate the search costs factors that H2 was built upon.

The empirical finding in this study is consistent with Bailey et. al. (2007). They compared the price level between sellers who were listed on PCAs with companies who were not listed at all (not like in this thesis, were all retailers are listed regardless if there is an agreement or not. They found that the sellers who cooperated with the PCAs had lower prices compared to other sellers.

H3: There is a negative relationship between the degree of involvement and price dispersion	***SUPPPORTED***

The rational of this hypothesis is that the level of involvement affects the extent of information search. As discussed in section 4.1, the level of involvement in this case is basically about the financial risk, which is measured by the price level. If the level of involvement is low, the consumer doesn't bother to put a lot of effort in order to find and compare different alternatives. Uninformed consumers can be exploited by sellers which should result in larger price dispersion. A higher level of involvement on the other hand will in most cases lead to extensive information search, which makes the consumer aware of a

larger number of offerings which makes it harder for a seller to charge a price premium (Blackwell, Miniard and Engel, 2006).

The degree of involvement is determined by several factors, but the one most relevant in this case is the financial risk. The average price of a product is used as a proxy for the financial risk. Price dispersion is measured by the coefficient of variation provided by Baye and Morgan (2004). This is a unit less measure of price dispersion that can be used to compare relative variation between products with different prices. The coefficient of variation is defined as the ratio between the standard deviation of prices to the mean price. The degree of linear relationship between the two variables is analyzed by Pearson's coefficient of correlation.

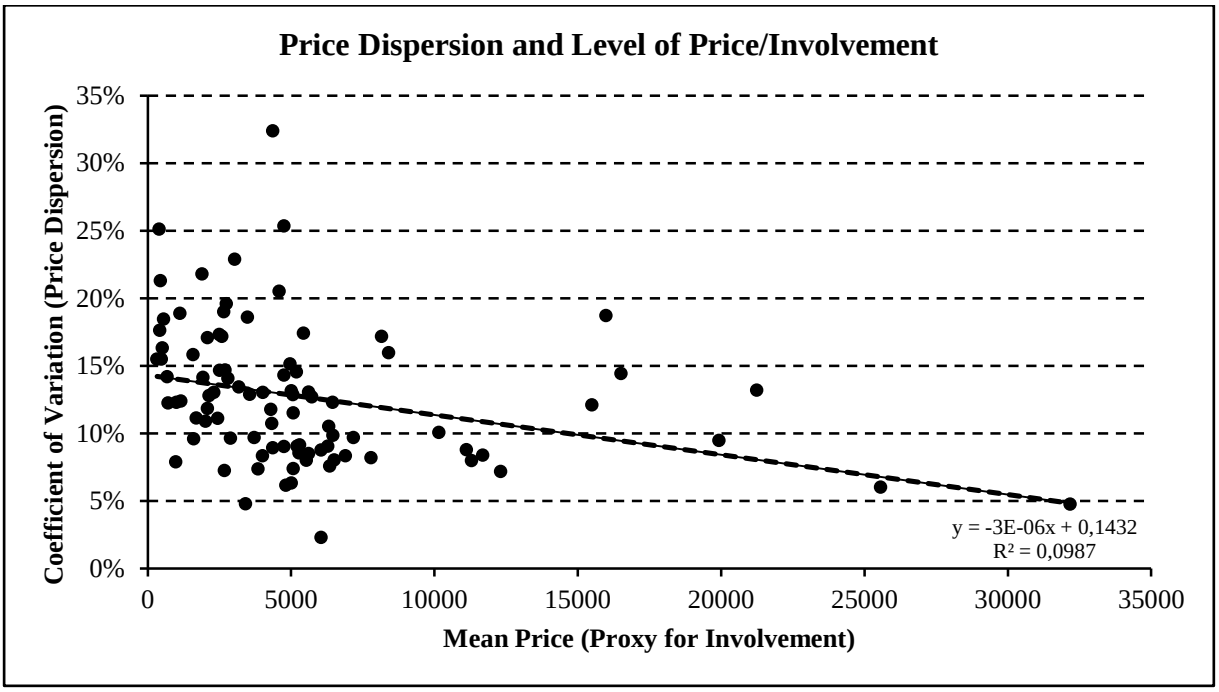

Figure 9

Figure 9 illustrates the relationship between the two variables price dispersion (coefficient of variation) and level of involvement (Mean price) for the 92 products in the sample. Pearson's coefficient of determination between the variables *mean price* and the *coefficient of variation* was -0,314 (p=0.00). This shows that there is a statistically significant negative relationship between the two variables and H3 is therefore accepted. The dashed line is a regression line calculated according method of least squares.

The results show that the price dispersion decreases with the price level in the sample. The level of price dispersion is lower for more expensive products compare to less expensive. However, the relationship is far from perfectly linear and the coefficient of determination (R^2)

of the regression line in Figure 9 is 9.9%, meaning that the mean price of a product explains 9.9% of the variation of the coefficient of variation.

H4: Sellers who have physical stores charge higher prices.	***NOT SUPPPORTED***

According to hypothesis 4, retailers with physical stores have greater capability of exploiting search costs and charge price premiums. The argument was that people who visits brick-and-mortar stores uses PCAs less, and are less informed compared to internet shoppers. Companies with a large number of physical stores are assumed to have a more loyal customer based, which makes it easier to charge a price premium.

As shown in Table 12, even though there was a positive relationship between the number of brick-and mortar stores and the price premium, this relationship was not statistically significant with a p-value of 0.69.

One possible reason for the unexpected result might be that sellers try to maximize their surplus by price discrimination. Price discrimination means that a company set different prices for the same product or service, and in this context, different price for different distribution channels, called *channel pricing* (Kottler et. al., 2009). Many of the large actors, like Elgiganten and SIBA for example set their prices differently in in different stores, which is also true for the online store. This statement is supported by the disclaimers visible on several of retailers' sites that basically states that the prices visible online not necessarily is the same as in the local store (SIBA, 2012, Elgiganten, 2012). If many of the actors set a lower price online compared to in their brick-and-mortar stores, the assumption stated in H4 will diminish. The magnitude of price discrimination is hard to estimate, but one should know that there are also examples of sellers that don't differentiate prices. NetonNet for example has the same prices in all of their warehouses as well as the web shop (NetonNet, 2012).

H5: There is a positive relationship between brand awareness and price.	***SUPPPORTED***

From a classic micro economic perspective, the price should be the only criteria a customer is considered when making a decision for buying a commodity. However, there are factors arguing for a positive relationship between brand equity and price premium has been discussed in this thesis. First, brands decrease the internal search costs since they are important when consumers scan their memory in order to come up with solutions for their

need. This process is in general much faster than external search processes and this convenience can be exploited by sellers with strong brands and enables them to charge price premiums. Second, brands also matters when consumers evaluate different options since consumers use brands as a proxy for the credibility in fulfilling promises and service quality (Wernerfelt, 1988, Smith and Brynjolfsson, 2001).

The regression model in Table 12 shows that there is a significant and positive relationship between the brand variable and price premium (P=0.02). The beta coefficient of 0.0325 means that the 24 well-known brands in the sample on average charged a 3.25 percentage points (100 SEK) larger price premium compare to the retailers with less known brands.

The results show that customers are willing to pay some extra for the brand even in a market characterized by extreme price pressure. The average price premium of 100 SEK might not sound very large, since it is only 1.83% of the mean price for the 92 products in the sample. However, this must be put in relation to the characteristics of the market. The margins are very low, the gross margins for Elgiganten for example were only 15% in 2010 (Elgiganten, 2011), and a price premium of 1.83% in this context is probably very important.

The fact that brand do matter is consistent with previous research from Smith and Brynjolfsson (2001). They investigated the electronic market for books, and found that the three dominant brands had a $1.72 price advantage compared to generic retailers. In order to compare the brands' importance between the two studies, we need to put this premium in relation to the price level of the products. The mean price of the books included in their sample was $40.11, and a $1.72 price premium equals 4.29% of the mean price. In other words, in the study by Smith and Brynjolfsson (2001), the three strongest brands were able to charge a 4.29% price premium of the mean price. For this study, the price premium (100SEK) in relation to the mean price (5473 SEK) equals 1.83%. This means that the importance of brands were larger in the previous study compare to the data in this thesis. However, one should notice that a simple comparison between the numbers is an approximation, since there are differences in how the studies were structured. For example, the study by Smith and Brynjolfsson (2001) had a dependent variable based upon actual behavior of the customer (clicks), while the independent variable in this thesis where the prices solely.

After a first look, it might seem surprising that the previous study showed a larger price difference between actors with strong brands compared to generic brands. First, books should

be a product related with a lower degree of financial risk since it is much cheaper than an average product in the consumer electronics category. A lower level of financial risk should lead to that a lower level of trust is necessary, and the importance of brands should be smaller. A second factor that makes this result unexpected is the fact that Smith and Brynjolfsson (2001) included only three sellers which was considered as having strong brands, while this survey included 24 brands. By only including the three strongest brands, the difference compared to the generic sellers should be larger compared to when a larger number of brands are included. This should also lead to that the brand variable should have a larger effect in this survey compared to the previous one, but this was not the case.

However, one should consider that the data by Smith and Brynjolfsson (2001) was gathered in a completely different time, in 1999. At this period, internet retailing was a new phenomenon, and a much smaller proportion of consumers had been involved in this kind of shopping. Since less people were familiar with this kind of shopping, it is reasonable to believe that the risks associated were perceived higher. This might be one reason for why consumers to a larger extent preferred to stick to well-known brands compared to today when a large proportion are familiar with e-shopping and the risks are perceived as lower. For the fourth quarter 2011 for example, 7 out of 10 Swedish consumers report that they have bought something online.

H6: There is a positive relationship between retailer´s reputation and price on PCA sites.	*NOT SUPPPORTED*

A high average grade should theoretically bring trust, and consumers should be willing to pay some extra for dealing with a trustworthy seller compared to a seller with a very poor reputation. Poor rated sellers therefore have to decrease their prices in order to compensate for the bad rating and keep sales up, and good grated retailers can exploit this advantage by charging premiums.

As shown in Table 12, in contrast to the prediction and hypothesis, there was a negative relationship between the average rating and the price premium (p=0.00). This means that retailers in the sample with good ratings had lower prices compared to retailers with lower average rating.

The rating systems on PCA sites measure customer satisfaction of a retailer, and the hypothesis presumes that companies that to a higher probability deliver high satisfaction also

can charge a higher price. However, the relationship might be a bit more complex than that, and this interesting result calls for a deeper analysis. Figure 10 shows the relationship between grading and price from a different perspective. The average grade is the same variable as in the regression model, but the price measurement is a bit more comprehensive. The x-variable in the graph is the proportion of all indexed products that a retailer offered which are rated as the cheapest one. The retailer Quizcore for example is the most extreme seller from this perspective (the dot at the far right in the graph). Out of the 41 indexed product Quizcore where offering, 19 (58%) was the cheapest offer available in the Prisjakt database. This price measure thus include all indexed products the 357 sellers offered at the time the data was gathered, which was 1,856,619 offers in total. In contrast to the previous analysis, this measure is not limited to just the most popular products.

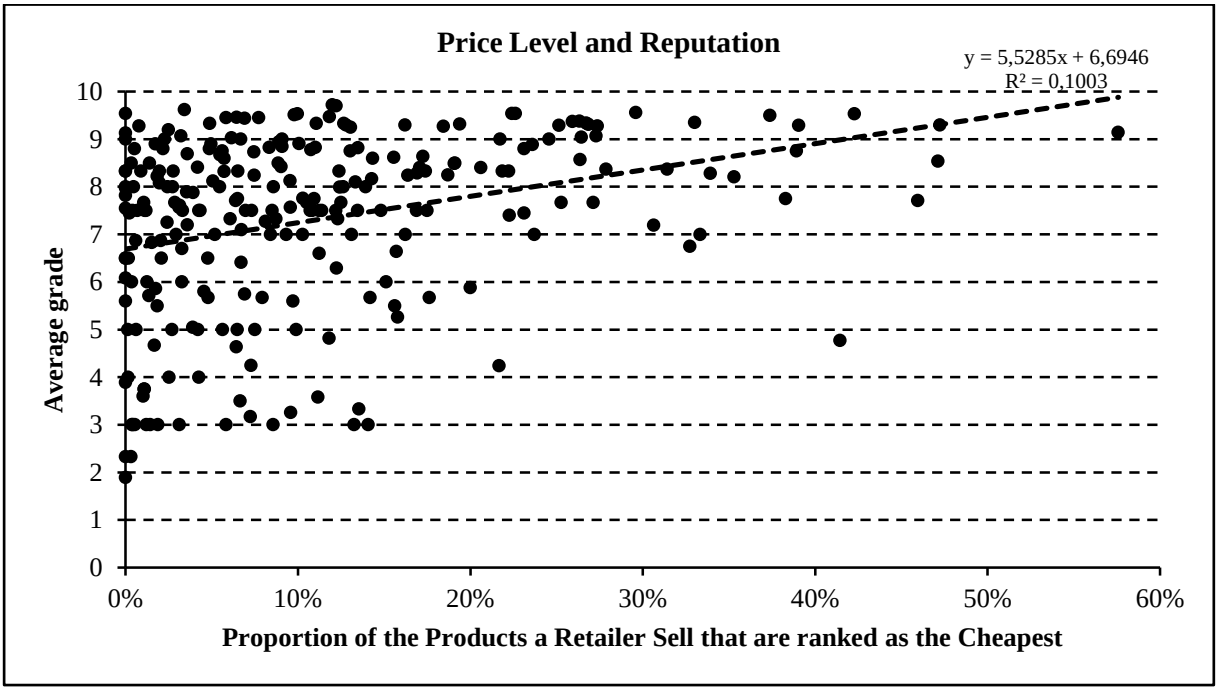

Figure 10

The results from the regression model and the graph below make it hard to question the negative relationship between price level and P2P rating.

In order to understand the empirical observation, a deeper analysis if customer satisfaction is necessary, which is assumed to be the driver of the P2P rating. The factors influencing customer satisfaction is illustrated in Figure 11. First, the level of satisfaction is influenced by the level of value that a customer perceives. The level of value is determined by the benefits subtracted with the costs. If the costs exceeds the perceived the costs, no value has been delivered. The cost can be both monetary such as the price, and non-monetary such as time

effort etc. However, delivering lots of value is not enough in order to get satisfied customers. Customer satisfaction is also to a large extent influenced by expectations. Delivering a small amount of value can result in a higher level of satisfaction when if exceeding the customer's expectations, compared to a scenario where lots of value were delivered, but still not enough to exceed very high expectations (Kasper et. al., 2006, Kotler et. al., 2009).

$$Customer\ Satisfaction = \ P2P\ Rating = \frac{Customer\ value}{Customer\ Expectations} = \frac{Benefits - Costs}{Customer\ Expectations}$$

Figure 11

This model might explain some of the unexpected negative relationship between the price level and average P2P rating. The reason is that customer often use price as a proxy for quality (Erickson and Johansson, 1985, Amaldos and Jain, 2005). This means that customers who choose a more expensive retailer might expect a higher level of quality delivered. When choosing the cheapest retailer on the other hand, the expectations regarding delivery time etc. might be much lower. This might be one reason why cheaper retailers to a larger extent is rated higher, since they have might have it a bit easier to meet or exceed the expectations from customers.

Another possible explanation for the results is about customer value. As shown in Figure 11, the value is not only affected by the benefits or quality of the product or service delivered, but also the costs. This fact means that the price to a large extent influences the perceived value, which together with the expectations influences customer satisfaction. This means that customers are more satisfied by cheaper retailers since the received value is higher compared to more expensive retailers.

These results are not coherent with findings in previous research. For example, both Ma et. al. (2010) and Luo and Chung (2010) found that retailers with an unsatisfactory ratings had lower prices than retailers rated satisfactory. Lou and Chung (2010) found that this was more important for expensive products where the risk was perceived higher, and should also be the case in consumer electronics which to a large extent is high involvement products. Ong (2011) also studied consumer's attitudes toward online ratings on PCA sites, and found that 72 % of the respondents stated that they were willing to buy from an unknown seller if their rating exceeded 4 out of 5 stars. If this is true, high rated retailers would benefit from this and should be able to charge higher prices, which doesn't seems to be the case for the most popular products at Prisjakt.

H7: There is a positive relationship between the number of ratings and price.	***NOT SUPPPORTED***

A large number of P2P ratings should increase the level trust perceived by consumers since the average grade are based on a larger number of experiences.

This hypothesis is not supported, the regression model shows no statistically significant relationship between the two variables (p=0.14).

The results show that consumers don't put a lot of weight to the number of ratings when making a decision of which offer to select.

H8a: There is a positive relationship between the number of ratings and the average rating.	***SUPPPORTED***
H8b: Retailers with partnership with a PCA have a higher average rating.	***SUPPPORTED***

The starting point of the two hypotheses is the assumption that consumers to a larger extent choose to rate a retailer when they are dissatisfied compared to when they are satisfied (Castenbäck and Wennerström, 2007). This should result in a quite poor average rating, since a very large proportion of the satisfied customers don't see any reason to rate. However, there are systems with the objective to collect ratings from a larger group of consumers, systems that are only available for paying sellers. There is also information that PCAs manipulate grades in order to offer additional value to their paying customers (Isaksson and Stridh, 2008). For these reasons, there should be a positive correlation between both the number of ratings and average rating, and the dummy variable for partnership and average rating.

Regression (Reputation (Mean as dependent variable)				
	β Coef	**SE Coef**	**T**	**P**
Constant	7,1823	0,12	58,88	0,00
Reputation (No)	0,0003	0,00	3,46	0,00
Partnership	1,2738	0,24	5,32	0,00
S = 1,75229 R-Sq = 14,5% R-Sq(adj) = 13,8%				
N	249			
N*	108			

Table 13

Table 13 shows a regression model where the average rating is set as the dependent variable and the number of ratings and the dummy variable for partnership as independent variable. The adjusted coefficient of determination shows that 13.8% of the variation of the average grade can be explained by the two independent variables. Table 13 shows that there is a significant relationship between both the independent variables and average ratings since both p-values <0.05. The beta coefficient for *number of ratings* (0.0003) means that the average rating (1-10 stars) increased with 0.0003 for each rating, or 0.3 for 1000 ratings. The beta coefficient for the partnership variable (1.2738) means that the retailers who were partners with Prisjakt on average had 1.2738 *stars* higher grades compared to the other retailers. This means that both H8a and H8b are supported.

H9: There is a positive relationship between the number of recommendations from manufacturers and price.	***NOT SUPPPORTED***

The number of manufactures recommendations should just like recommendations from peers provide trust. This hypothesis derives drom the assumption that the trustworthiness of a large and well-known manufacturer could increase the trustworthiness of a retailer by an official recommendation.

The beta coefficient of number of manufactures recommendations is negative which means that there are a negative relationship between the number of recommendations from manufacturers and the price premium. This contradicts H9 which predicted a positive relationship. The p-value of 0.00 shows that the relationship is statistically significant.

An explanation for why customers don't seem to put much attention to the recommendations from manufacturers might be that this kind of information is more persuasive rather than objective. People might realize that the reason for this kind of recommendations might be related to the company's internal partnerships and not so much about quality.

H10: International sellers have lower prices than national retailers on PCA sites.	***NOT SUPPPORTED***

The nationality of the retailers was assumed to affect the price level since consumers got lower expectations regarding quality (Usunier, 2006). Fewer consumers also have experience from the international sellers and they are therefore assumed to have weaker brands.

As shown in Table 11, there was no significant relationship between the retailers based in Sweden compares to international sellers. The possibility to test the hypothesis might have been reduced by the fact that there were only 8 (3%) international retailers in the sample. However, this shows that there are mainly Swedish sellers selling the most popular products on Prisjakt which reduce the importance and relevance of this hypothesis.

7.4. Summary of Hypotheses Testing

Table 14 summarizes the results from the data analysis. Out of the 11 hypotheses, 4 were supported and 7 were not supported. Unexpectedly for 5 of the hypotheses, the analysis showed a statistically significant reversed relationship between the tested variables.

Hypotheses		**Results**
H1	Retailers with unknown brands are more likely to partner up with PCAs compared to retailers with well-known brands.	Not supported (Reversed relationship)
H2	Retailers with a direct link to their website charge higher prices.	Not supported (Reversed relationship)
H3	There is a negative relationship between the degree of involvement and price dispersion.	Supported
H4	Sellers who have physical stores charge higher prices.	Not supported
H5	There is a positive relationship between brand awareness and price.	Supported
H6	There is a positive relationship between retailer´s reputation and price on PCA sites.	Not supported (Reversed relationship)
H7	There is a positive relationship between the number of ratings and price.	Not supported (Reversed relationship)
H8a	There is a positive relationship between the number of ratings and the average rating.	Supported
H8b	Retailers with partnership with a PCA have a higher average rating.	Supported
H9	There is a positive relationship between the number of recommendations from manufacturers and price.	Not supported (Reversed relationship)
H10	International sellers have lower prices than national retailers on PCA sites.	Not supported

Table 14

8. DISCUSSION

8.1. The Role of Product Comparison Agents

This study clearly shows that PCAs are important actors in the electronic market for consumer electronics. Consumers are using this kind of service to a large extent which was already known from previous studies. 77% of the consumers report that they are using these services before buying consumer electronics (HUI Research, 2012), and Prisjakt.se got about 800,000 unique visitors every week (KIA-index, 2011). This picture is confirmed in this study, by for example looking at the large number of ratings stemming from consumer experiences. There were 103,784 unique ratings just for the 357 retailers in this sample (Table 10). Considering the fact that there were 3,462 retailers in total at Prisjakt.se (Prisjakt, 2012), there is no doubt that consumers uses this kind of services to a large extent, and that PCAs have and will continue to shape consumer decision making.

The fact that PCAs are popular among consumers isn't that surprising, it makes the decision-making process much more comprehensive and less time consuming at the same time. However, this study also shows that a large share of retailers is also actively participating in the studied PCA, 50% of the sellers in this study had some kind of agreement with Prisjakt. Since there was 3,462 retailers listen in total, there is no hesitation regarding the fact that a large number of retailers consider PCAs as an important partner. The last and maybe the most striking evidence of the importance of Prisjakt is the number of offerings that are available. On average, there were 5,215 different offers related to each store of the 357 stores in this study, which really highlights the magnitude of this service.

All his together illustrates that PCAs are very powerful actors in many of today's e-markets. PCAs control a large part of the consumers' information search process. The use of PCAs has only been growing up to this point, and it will probably continue to grow because of the high growth of e-commerce in general. This kind of intermediary is also establishing in new markets and product categories. One example is Elskling.se since the start-up in 2007 has helped 200,000 Swedish consumers to compare and buy electricity subscriptions (Elskling, 2012).

8.2. How Retailers can Exploit Market Imperfections and Differentiation

The research question of this paper was how online retailers can reach profits and charge price premiums for their offers in commoditized markets where PCAs dominate. A prerequisite of price premiums are price dispersion, frequently discussed in previous research. The

emergence of the internet and PCAs would decrease market friction and lead to perfect markets with no price dispersion according to micro economic theory. However, as discovered in e.g. Smith and Brynjolfsson, 2001, Iyer and Pazgal, 2003, Bailey et al., 2007, Ma et al., 2010 and Luo and Chung, 2010, Baye and Morgan, 2004, and confirmed in this study, price dispersion still exists. Table 8 shows that the offerings in the sample on average were 28.1% higher than the lowest price, which means that the theoretical law of one price is quite fare away from this reality.

Price dispersion shows that there are opportunities for a seller to charge above average price and make profits. From a sellers' perspective, it is therefore important to understand the drivers of price dispersion further. Theoretically, there are two factors that drive price dispersion; market imperfections and differentiation (Bailey et. al., 2007). The following section will discuss these two sources of price dispersion, the impact of PCAs on consumer decision making, and what factors that enables seller's to charge price premiums.

How sellers can exploit market imperfections

Market imperfections are linked to the basic functions of the markets that need to work in order for the market to work efficiently discussed in section 2.4. Market imperfections in this context are to a large extent about search costs and the cognitive boundaries in consumer decision making. According to the consumer decision making process model (Figure 3), the consumers start with an internal search process after recognizing a need (Blackwell, Miniard and Engel, 2006). The costs associated in this process are completely out of the PCA's control. The internal search process is about recalling alternatives for satisfying the need from memory. What are important in this process are brands, and especially what is called brand recall in marketing research (e.g. Keller, 2008). If the internal search process results in a satisfying alternative of how to solve the need, the consumer will not move on to external search. This suggests that sellers with strong brands should be able to charge a premium since a larger proportion of their customers skip the external search process and therefore don't bother to consider competing offers. In other words, the search costs for internal search are not equally distributed across retailers; it is much lower for retailers with well-known brands. This reasoning is supported in this thesis, since the largest sellers (with the most well-known brands) charged higher price premium compared to sellers with less known brands. The conclusion is therefore that retailers with strong brands can exploit market imperfections (internal search costs) in order to charge price premiums, even after the emergence of the internet and PCAs. However, the relationship between brand and price premium was not

large, about 100 SEK in average for the products in the sample (Section 7.3, H5), and building brand awareness is costly. It is therefore not sure that an investment in the brand is a good investment.

In the external search process on the other hand, PCAs have probably to a large extent erased market imperfections related to search costs. Before the emergence of PCAs, external search costs online were unequally distributed, it was a lot easier to find larger retailers in regular search engines (like Google) since the search results to a large extent is sorted based on the number of external links (Wan et al, 2007). The search cost related to small and new-established sellers were high. This suggests that there previously was an opportunity for large sellers to exploit search costs even in the external information search process.

With the emergence of PCAs on the other hand, this has changed. On PCA sites, offerings are sorted according to price, and the search costs are much more equally distributed across large and small retailers, making it hard for large actors to exploit search costs. However, there are only the retailers with an agreement with the PCA who got a direct link to the web shop; meaning that the search costs should be lower for them. The results in this study however show that this link is not related to any price premium. This indicates that customers don't perceive the process of finding a seller outside the PCA as much of a problem. This suggests that the search costs relate to external search to a large extent has been eliminated, and there are not many opportunities for sellers to make use of these costs to charge premiums.

Another market imperfection previously related to external search costs was the cognitive boundaries of consumers' information processing. In this study, there were 52 different offerings/sellers on average for each product. Before PCAs existed, there was no way a consumer could find, and later evaluate this number of alternative offerings. However, by using a PCA, this is now possible meaning that the cognitive boundaries are less of a restriction today. This also confirms the previous conclusion that PCAs to some extent have decreased market imperfections which makes it hard for sellers to charge price premiums.

If accepting the fact that the search costs today to a large extent is associated with internal search, and almost eliminated in the external search process, one relevant question arises; how are consumers' information search divided between internal and external search? If a large proportion of consumers only do internal search, this would suggest that the importance of brands are higher compared to a scenario when most of the consumers search externally. According to a survey by HUI Research (2012), 77 % of the consumers of consumer

electronics check a PCA before buying online. This would suggest that a very large proportion of the consumers search externally. This could be explained by the fact that consumer electronics to a large extent is associated with high level of complexity and involvement, since the products are quite expensive (the average prices of the 92 products in the sample were 5,473 SEK, Table 9). A high level of complexity and involvement are traditionally associated with a higher level of external information search (Blackwell, Miniard and Engel, 2006). Since such a large proportion of the customers search externally, it seems quite hard for sellers to exploit search costs related to internal search (by building brands). It is also possible that the emergence of PCAs has change consumer decision making by getting a larger proportion of consumers to involve in external search. Traditionally, the amount of external search is determined by the perceived cost of obtaining additional information exceeds the perceived benefit of this cost (Stigler, 1961, Urbany, 1989). PCAs has both decreased the cost of obtaining information drastically, and at the same time increased the expected benefit from the search. This might explain why such a large share of the consumers involves in external information search and use PCAs. This seems to be particularly true for more expensive products, since this study shows that price dispersion is larger for expensive products compared to less pricy products (a result consistent with Bart et. al., 2005). This suggests that the possibility to exploit search costs is larger for cheaper products.

The conclusion is therefore that the opportunity for retailers to exploit search costs has been decreased, this since PCAs has made consumers' external search process more efficient, and a larger proportion of consumers do search externally before buying. However, there still seems to be a small opportunity for sellers to get a price premium by building brands, since all consumers do not involve in external search. This opportunity seems to be larger for less expensive products.

How sellers can differentiate

The next step in the consumer decision making model is pre-purchase evaluation of alternatives. This is also linked to the research question of this thesis, since this is a source of price dispersion and therefore a possibility for a seller to get a price premium.

Differentiation in this context is not about the product itself, but rather about the service quality of the retailer. Differentiation in several dimensions has been analyzed in this thesis. Most of these factors are associated with trust, both regarding protecting the customer from opportunistic behavior (such as fraud), but also the trustworthiness in that the retailer's ability of fulfill its promises regarding service quality (such as delivery time and customer support

etc.). These factors were measured by the existence of a strong brand and reputation. Customer should associate a strong brand with trust since they use brands as a proxy for service quality and perceived risk (Erdem and Swait, 2004, Smith and Brynjolfsson, 2001, Wernerfelt, 1988). As discussed previously, the importance of brands should also be more important for products characterized with a high level of involvement (Bart et. al., 2005). This study confirms that retailers with strong brands are able to charge a price premium, even though the price premium of 100 SEK on average is low.

Reputation on the other hand doesn't seem to affect the ability to charge price premiums. A customer is assumed to expect a higher level of trust and quality and would therefor prefer a retailer with a good reputation, and therefore increase the probability to choose that retailer (Ong, 2011). Lou and Chung also found that retailer with good reputation had higher prices.

Surprisingly, in summary, this study does not provide hope to retailers trying to differentiate in order to charge price premiums (apart from a small effect of strong brands). Additional information of the retailer, such as the displaying of a logotype, informational text etc. showed no positive correlation with price premium. This was also true for the number of recommendations from manufacturers. There was also a negative relationship between both the average grade and the number of grades and price premium. This result is not consistent with previous research (Ma et. al., 2010, Luo and Chung, 2010 and Ong, 2011). It seems like consumers in the online consumer electronics market doesn't seem to value the fact that a retailer deliver a higher level of service quality. Since this finding contradicts previous research to a large extent, one might suspect that there are some special characteristics of this particular market. The market of consumer electronics in Sweden has been very turbulent for the last years, with price wars, bankruptcies and consolidation. The special characteristics of the market might explain some of the unexpected results in this study.

The Consumer Electronics market in Sweden; Price-Wars and Consolidations

The consumer electronics market in Sweden has gone through some major changes the last years. It all started in 2006, when the German retailer Media Markt entered the Swedish market (Dagens Industri, 2011a). This was the beginning of a price war between Media Markt and Elgiganten which turned out to change the market significantly. The largest actors spent tremendous resources on advertising and price cutting which totally erased margins. Media Markt's establishment turned out to be a costly investment, with 1.1 billion SEK in losses the first five years (Dagens Industri, 2011b). The market wasn't large enough for all retailers and there was no doubt that the market was over-established. On the 11th of July 2011, the board

of Onoff applied for liquidation. At that time, Onoff had 67 Swedish stores, 900 employees and an annual turn-over exceeding 3 billion SEK (Dagens Industri, 2011c). Another large retailer, Expert, bought 30 of the stores (the rest went to liquidation) and one distribution center. Another case of consolidation was carried out a couple of moth earlier, when SIBA bought NetonNet (Dagens Industri, 2011d).

Today, after years of poor profits driving consolidations, things have calmed down. For the resent financial year, both Elgiganten and NetonNet had presented small profits, SIBA shrinking losses, and Media Markt expects a profit for the next year (Dagens Industri, 2012a). Expert has chosen to leave the price war, shifting focus and from price towards differentiation through customer service and expertise (Dagens Industri, 2012b).

The turbulent market might be one reason for some of the unexpected results in this study. A majority of the hypotheses discussed in this thesis are about to what extent different factors should affect price. However, some of the large actors in this market have spent the last years solely communicating their low prices, and price has been the only source of competitive advantage (Dagens Industri, 2011e). This could be one explanation why this study shows such a small price premium for brands, reputation and recommendations for manufacturers. Since price is the only criteria of evaluation the sellers has been communication, customers has been educated to only care about price as well. From the retailers' perspective, there is a possibility that these years of price wars have destroyed the market potential for a number of years ahead. Some actors, like Expert for example, are trying to re-educate customers to consider service quality criteria, but it is too early to predict whether they will succeed or not.

What this thesis hasn't investigated is the effect all variables might have on volume. It is possible that some of the factors, like good reputation, partnership etc. drives volume which of course are as related to profit as the price level. However, no matter of the volume, it is not possible to make any money at the last year's price level, as the income statements of the largest actors for the largest actors present.

The conclusion is therefore that this study will not provide any clear answers of how a seller can differentiate their offerings in order to get price premiums. All the factors tested in this thesis that were expected to be associated with price premiums were not supported, besides a small positive effect of strong brands.

8.3. Is There Any Hope for Online Retailers of Consumer Electronics?

The findings of this thesis don't provide much hope to premium retailers. Rather, this study confirms that price seems to be the largest competitive advantage in the market.

So what alternatives are left for retailers of consumer electronics? A simple model of strategy is Porters four generic strategies. The four strategies are basically a matrix that categorizes strategies according to two variables. First, the target scope can either be broad or narrow, meaning that companies either can target the whole market, or focus on a smaller market segment. The second dimension is about competitive advantage, which basically is a choice between costs and differentiation (Porter, 1998). The four strategies are shown in Figure 12.

For the last years, the largest actors has all tried to take the cost leadership, and all actors like Media Markt, Elgiganten, Siba, Onoff and NetonNet qualifies into the cost leadership category. The profitability in this segment is questionable, and is extremely resource demanding (Dagens Industri, 2011e).

The differentiation strategy is not as common, but is where Expert is trying to go, when focusing on a higher level of service quality (Dagens Industri, 2012b). Expert is targeting a broad target market, and they have about 165 stores in Sweden. This result from this study however doesn't favor this strategy, since it shows that retailers that service related measures such as reputation aren't related to any price premium.

What is remaining for sellers to consider are more focused strategies. As shown in Figure 12, there are two different kinds of focused strategies. First, a seller can try to focus on a narrow market segment with a low cost/price strategy. This strategy is quite common, many small online actors within the consumer electronics market focuses on one specific product segment such as cellphones etc. This strategy can be profitable since a focused strategy might provide economies of scale for small product segments. Many of the large actors' on the market offer tens of thousands of products, which of course makes the turn-over for many of these products quite low. By specializing in a small product segment, sellers can increase the inventory turn-over for these products and increase profits. A focused seller can also offer a wider assortment of products within a narrow product segment, and thereby provide more competitive offers to specific product segments (Porter, 1998).

The last strategic option is to differentiate by offering great service quality, but target a smaller part of the market. This study shows that the general consumer doesn't seem to care much about service quality, but that doesn't mean that there aren't smaller customer segments

that do. Based on the results of this study, this strategy seems to have greater potential than a pure differentiation strategy targeting the whole market.

	Advantage	
Target Scope	***Low Cost***	***Product Uniqueness***
Broad	Cost Leadership	Differentiation
Narrow	Focus (Low Cost)	Focus (Differentiation)

Figure 12

The market for consumer electronics is over-established and the rivalry is intense. The consequence is that almost no retailers are making any money at all, and this thesis can't provide any revolutionary answer of how to make money in this market. Kim and Mauborgne (2004) call such a market a *red ocean,* where companies try to outperform rivals solely by conquer market shares, which transforms products into commodities. The boundaries of a red ocean market are well-established and known. In such a market, it is easy to get stuck by thinking about how to compete. Kim and Mauborgne (2004) argue that companies instead should emphasize on finding *blue oceans,* meaning markets that do not exist today. Companies can create and shape new markets by breaking the red oceans boundaries. This logic is related to the previous discussion of Porters generic strategies. Few sellers benefit or have the resources to compete in the cost leadership segment, the red ocean. Retailers should therefore to a larger extent try to find blue oceans, by finding new customer segments nobody has cared about earlier.

9. CONCLUSION

The theoretical discussion of this study ends up by concluding that PCAs have a large impact on consumer behavior. Search costs related to internal search might still be present, but search costs related to external search have decreased significantly, leading to less market friction.

The main research question of this paper was how online retailers can reach profits and charge price premiums for their offers in commoditized markets where PCAs dominate. The results of this thesis don't provide much hope for retailers trying to avoid price pressure on the market for consumer electronics. Most of the factors assumed to be related to price premiums, such as direct links, brick-and-mortar stores, reputation and manufacturer recommendation

showed no positive correlation with price premium. Retailers having a strong brand on the other hand were able to charge higher price premiums than competitors. This means that this study don't provide any clear answer to how retailers can avoid price pressure on PCA markets. The major finding of this thesis is therefore the lack of results between these factors and price premiums. The findings in this study contradict many of the previous research in this field, and might be explained the extreme characteristics of this particular market. Years of price war have erased profitability and retailer as well as consumers has solely been focusing on price.

10. LIMITATIONS

10.1. Price as Dependent Variable

The most important limitation of this study was the fact that price was used as a dependent variable. Price in this case was used as a proxy for what the customer's value and offer. This assumes that the retailers are completely rational, selecting exactly the right price level to match demand. This is not very realistic however, and some of the offerings are certainly under or overpriced. One way to control this is to include some kind of volume measure into the model, such as traffic data. This information measures how customers value an offer with higher accuracy.

10.2. Generalization

This study includes data from the most popular products at Prisjakt.se. It is not certain that these results should be the same when including less popular products. For example, some retailers might use some of the most popular products as a marketing vehicle, just to increase traffic to their stores in order to sell more expensive products.

11. SUGGESTIONS FOR FUTURE RESEARCH

PCAs are still a new research area, and there are numerous areas where more research is needed, especially for marketing scholars. The importance of this research will increase with the growing use of PCA sites. This is some interesting research areas that as derived from the work with this thesis.

11.1. Variables for Differentiation

Even in markets characterized with homogenous products, offers are perceive difference between offers. Some variables such as brands have been discussed in this study and in previous research, like brand and other trust related factors. However, there are also other potential dimensions for differentiating offers, like delivery time, warranties, customer support, the right to return a good and payment alternatives etc. At this point, there is a weak understanding regarding the important these factors are for consumers and retailers in PCA market.

11.2. Qualitative Research

Most of the research in this field has been quantitative focusing variables such as price, price dispersion etc. There is not much quantitative research aiming for understands consumer behavior and seller strategy.

11.3. New Emerging Markets

New PCAs are still emerging, and existing PCAs are moving into new markets. Resent examples are Lendo comparing consumer loans (Lendo, 2012), and Elskling that compare electricity subscriptions (Elskling, 2012). One way of understanding the PCA's impact on market would be to follow such an introduction from the beginning and investigate how the market might evolve.

11.4. PCAs and Evaluation of Products

This thesis has been focusing on the search and evaluation of retailer. However, it is likely that PCA's also plays an important role when consumers are choosing which product to buy. Many of the PCAs gather a lot of product information and provide smart tools helping consumers to select which product to buy.

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APPENDIX I. NET SALES OF PCAs

The table below shows the net sales for a sample of PCAs that are active on the Swedish market.

Website	**Name**	**Net Sales (KSEK)**			
		2007	**2008**	**2009**	**2010**
compricer.se	Compricer AB	11 256	15 931	15 649	21 962
elskling.se	Elskling AB	1 200	5 897	21 628	23 124
expedia.se	Expedia Sweden AB	-	126	4 784	12 812
insplanet.se	Insplanet AB (publ)	53 434	59 903	79 032	82 013
kelkoo.se	Kelkoo AB	24 877	20 422	16 993	21 616
kraftum.se	Kraftum Sverige AB	-	-	-	1 619
lendo.se	Lendo AB	65	2 155	18 945	50 949
pricerunner.se	Pricerunner Sweden AB	63 470	65 868	59 354	59 596
prisjakt.se	Prisjakt Sverige AB	16 963	31 163	38 953	53 458
suredo.se	Suredo AB	-	1	36	1 787
travelpartner.se	Svenska Resegruppen AB	73 637	168 503	189 774	218 900
flygresor.se et al.	Svenska Resenätverket AB	5 642	8 475	11 978	19 928
Sum		*250 544*	*378 444*	*457 126*	*567 764*

Source: The companies' annual reports were downloaded from www.retriever.se

APPENDIX II. PRODUCT SAMPLE

Popularity ranking	Product	Product category
1	Apple iPad 2 16GB	Tablets
2	Sony Xperia S	Cell phones
3	HTC One X	Cell phones
4	Apple iPad 16GB (3rd Generation)	Tablets
5	Samsung GT-i9100 Galaxy S II	Cell phones
6	Nokia Lumia 800	Cell phones
7	Asus Eee Pad Transformer Prime TF201 with Keyboard Dock 32GB	Tablets
8	Apple iPhone 4S 16GB	Cell phones
9	Apple TV (3rd Generation)	Media centers
10	Nikon D800	Cameras
11	Apple iPad 32GB (3rd Generation)	Tablets
12	Diablo III	PC-games
13	Samsung GT-N7000 Galaxy Note 16GB	Cell phones
14	HTC Flyer 16GB	Tablets
15	Sony Ericsson Xperia Arc S	Cell phones
16	D-Link Boxee Box DSM-380	Media centers
17	Sony Ericsson Xperia Ray	Cell phones
19	HTC One S	Cell phones
20	Canon EOS 600D + 18-55/3,5-5,6 IS	Cameras
21	Asus RT-N66U	Routers
22	Canon EOS 5D Mark III	Cameras
23	Apple iPad 4G 64GB (3rd Generation)	Tablets
24	Sony Playstation 3 Slim 160GB	Gaming consoles
25	Diablo III - Collector's Edition	PC-games
27	Apple iPad 4G 16GB (3rd Generation)	Tablets
28	Google Galaxy Nexus	Cell phones
29	Apple iPad 64GB (3rd Generation)	Tablets
30	Sony PlayStation Vita	Gaming consoles
31	Apple MacBook Pro - 2,4GHz DC 4GB 500GB DVD±RW 13"	Laptops
32	Nikon D7000	Cameras
33	Samsung UE55D8005	LCD-TV
34	Apple iPad 4G 32GB (3rd Generation)	Tablets
35	Mass Effect 3	PC-spel
36	Apple iPhone 4 8GB	Cell phones
37	Samsung GT-i9210 Galaxy S II LTE	Cell phones
39	Samsung GT-P7500 Galaxy Tab 10.1 16GB	Tablets
40	Sony Playstation 3 Slim 320GB	Gaming consoles
41	Samsung 830 Series MZ-7PC128 128GB	Solid State-discs (SSD)
42	Sony Bravia KDL-55EX723	LCD-TVs
43	Samsung UE46D8005	LCD-TVs
44	Battlefield 3	PC-games
45	Nikon Coolpix P510	Cameras
46	Samsung GT-P6800 Galaxy Tab 7.7 16GB	Tablets
47	Apple iPad 2 3G 16GB	Tablets
48	Sony NEX-7 + 18-55/3,5-5,6 OSS	Cameras

49	Motorola Xoom 32GB	Tablets
50	Samsung GT-P7310 Galaxy Tab 8.9 16GB	Tablets
51	Nintendo 3DS	Gaming consoles
52	Canon PowerShot S100	Cameras
53	Nokia N9 16GB	Cell phones
54	Asus GeForce GTX680-2GD5 2GB	Graphic cards (PCI Express)
56	Skylanders Spyro's Adventure: Starter Pack	Nintendo Wii-games
57	Sapphire Radeon HD7970 HDMI Dual-DisplayPort 3GB	Graphic cards (PCI Express)
58	Apple iPad 2 3G 32GB	Tablets
59	Beats by Dr. Dre Studio	Headphones
60	Apple TV (2nd Generation)	Media centers
62	Apple iPod Touch 8GB (4th Generation)	MP3-players
63	Sony Xperia P	Cell phones
64	Sony Bravia KDL-55NX720	LCD-TV
65	Dell UltraSharp U2412M	Screens
66	EVGA GeForce GTX 680 HDMI DisplayPort Dual-DVI 2GB	Graphic cards (PCI Express)
67	HTC Wildfire S	Cell phones
68	Sony Xperia U	Cell phones
69	Intel 520 Series 2.5" SSD 120GB	Solid State-discs (SSD)
70	Samsung microSDHC Class 10 32GB	microSDHC-cards
71	Nikon 1 J1 + 10-30/3,5-5,6 VR	Cameras
72	GoPro HD Hero2 Outdoor Edition	Video cameras
74	Mass Effect 3	Xbox 360-games
75	Samsung GT-S5690 Galaxy Xcover	Cell phones
76	Western Digital TV HD Live Media Player Gen 3	Media centers
77	Nokia N8	Cell phones
78	Microsoft Xbox 360 Slim 250GB	Gaming consoles
79	Gigabyte GeForce GTX 680 HDMI DisplayPort Dual-DVI 2GB	Graphic cards (PCI Express)
80	Sony Bravia KDL-46EX723	LCD-TV
81	Canon EOS 5D Mark II	Cameras
82	Sony Ericsson Xperia Active	Cell phones
83	HTC Desire S	Cell phones
84	Samsung GT-S5830 Galaxy Ace	Cell phones
85	Samsung LE40D504	LCD-TV
86	Star Wars: The Old Republic	PC-games
87	SteelSeries Siberia v2 Full-size Headset	Headsets
88	Samsung GT-S5660 Galaxy Gio	Cell phones
89	Onkyo TX-NR609	Surround receivers
90	Sony NEX-5N + 18-55/3,5-5,6 OSS	Cameras
91	HTC Sensation XL	Cell phones
92	Panasonic Viera TX-P46G30Y	Plasma-TVs
93	Apple MacBook Air - 1,7GHz DC 4GB 128GB 13"	Laptops
94	Sony Dual Shock 3 (PS3) (Original)	Gaming units
96	Nokia Lumia 710	Cell phones
98	Microsoft Xbox 360 Slim 250GB (inkl. COD Modern Warfare 3)	Gaming consoles
99	Apple iPad 2 32GB	Tablets
100	Samsung UE55D7005	LCD-TVs

APPENDIX III. THE IMPORTANCE OF STOCK AVAILIBLILITY

All offerings were included in the sample regardless if they were in stock or not. The major reason for this decision was that this information was hard to retrieve; it had to be manually collected for each of the 4806 offerings. In order to test the importance of this information, a pre-test was made with the nine most popular products, including 559 of the offerings.

The table below shows the result from a simple regression analysis where the price premium (%) is the dependent variable and the stock availability as an independent variable. The availability variable is a dummy variable that equals 1 if the product was in stock, otherwise 0.

Constant	**β Coef**	**SE Coef**	**T**	**P**
Constant	0,214	0,012	17,870	0,000
Availability	0,009	0,016	0,600	0,548
R-Sq = 0,1%				
R-Sq(adj) = 0,0%				

As shown, there is no statistically significant correlation between the two variables. The beta coefficient shows a slightly positive relationship, but the p-value of 0.548 shows that this relationship to a large probability caused by random.

APPENDIX IV. THE BRAND VARIABLE

In this study, large companies are approximated to have strong brands. The table bellows shows the net sales for the 22 sellers with net sales exceeding 200 million SEK, which includes 24 brands since two of the sellers have two brands.

Seller	**Net Sales (KSEK, 2010)**
TeliaSonera Sverige Aktiebolag' (Including Halebop)	30 158 984
Tele2 Sverige Aktiebolag (Including Comviq)	13 108 759
Telenor Sverige Aktiebolag	10 268 028
Clas Ohlson Aktiebolag	5 828 000
Elgiganten Aktiebolag	5 791 778
Dustin Group AB	4 494 380
Siba Aktiebolag	3 091 563
Netonnet AB (publ)	2 304 688
Expert Sverige AB	2 011 864
GEAB The Phone House Aktiebolag	1 311 684
CDON AB	1 199 215
Komplett Services Sweden AB	1 174 588
Ellos Aktiebolag	931 779
Webhallen Sverige AB	718 812
Kjell & Co Elektronik AB	643 631
TeknikMagasinet Sweden Aktiebolag	584 373
Game Stores Group Sweden AB	569 918
Halens AB	486 127
Tretti AB	450 746
Scandinavian Photo AB	357 946
Hemmakväll	339 181
CyberPhoto Aktiebolag	229 275

Source: The companies' annual reports were downloaded from www.retriever.se