TWO ESSAYS ON CONSUMER CONSENSUS ON PERCEIVED QUALITY

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ABSTRACT OF THE DISSERTATION

Two Essays on Consumer Consensus on Perceived Quality

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The concept of consensus has been investigated by scholars from various disciplines. However, in the area of marketing, few researchers have examined the role of consensus in the consumer decision-making process. Studies devoted the consumer consensus have produced conflicting results depending on the type of product examined. To shed light on its impact on the consumer decision-making process, I will investigate consumer consensus using a dataset comprised of 1144 brands over an 11-year time period.

This dissertation consists of two essays about consumer consensus on quality. In the first essay, I examine antecedents of the perceived quality discrepancy (PQD) which reflect the lack of consumer consensus on quality perceptions in a market. Moreover, the impact of PQD on brand-level sales and purchase intention scores is examined. Results indicated a negative relationship between PQD and perceived quality. Similarly, PQD has a negative impact on brand-level sales and purchase intention scores. In addition, advertising expenditures generate more revenues for brands that have higher PQD. Also,

the negative impact of PQD on purchase intention is higher for the brands that have higher quality.

In the second essay, I examine the impact of PQD on perceived quality by time perspective. In this study, I aim to illuminate changes in quality perceptions in response to the consensus on quality. The results indicate that on average, a change in PQD can be fully realized after 1.84 years. Moreover, the short-term effect of PQD on perceived quality is higher for service brands and higher in the hedonic product categories than in the utilitarian categories. Results also indicate that the carryover duration can take as long as 2.51 years for products, while it can take as long as 1.98 years for services.

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INTRODUCTION TO THE DISSERTATION

Although marketers assume customers are aware of what they want (Riquelme 2001), consumers are rationally bounded (Newell and Simon 1972). Therefore, heuristics play an important role in the decision-making process (Evans 1990). Among many other heuristics, the information ecology of the individual is a crucial part of this process since it might provide reliable information regarding the product.

As in the case of the false consensus effect (Ross, Green, and House, 1977), which is a cognitive bias that leads to individuals' overestimations about the portion of society that shares similar beliefs or opinions, consumers might draw the wrong conclusions and misinterpret the information provided by their environment. However, advancements in communication technologies enable consumers to track the beliefs, opinions, and preferences of other individuals in their society.

One of the theoretical explanations of consumers' reliance on public opinion is the social comparison theory (Festinger 1954), which states that individuals tend to change their position when comparing their thoughts and attitudes with other people. Eventually, a majority of a certain opinion or belief results in social influence that affects the decision-making process.

Due to technological advancements, the availability of tracking the perceptions of other individuals has brought the role of public opinion forward in the decision-making process in many areas, suggesting that people need external cues to make an accurate evaluation. To name a few, politics, finance, and marketing have become some areas where decision-makers often scrutinize information ecology to make accurate decisions. Therefore, various actors focused on shaping information ecology in their favor. In

politics, 45% of Twitter activity is created by highly-automated accounts (Sanovich 2017). Ferrera (2016) found that among the four million election-related tweets in the United States presidential elections in 2016, 400,000 election-related posts were created by online bots. Similarly, fake reviews and news are prevalent in the area of marketing, although it is hard to determine their portion in the number of total messages available in consumers' information ecology (Luca and Zervas 2016). The prevalence of fraud-related activities on online platforms shows the role and significance of individuals' reliance on their information ecology and public opinion in their decision-making process. Moreover, online consumer reviews have had exponential growth in the last decade (Langan, Besharat, and Varki 2017), and consumers' interest in these reviews also reflect the increasing dependence of consumers to their information ecology in their decision-making process.

In the chaotic structure of consumers' information ecology, the credibility of the information plays a vital role when consumers form a judgment on a particular brand or product. The role of the credibility of information in commercial settings has been addressed by various scholars (e.g., Freeman 1959; Jin and Phua 2014; Kamen, Azhari, and Kragh 1975; Mowen and Brown 1981). Credible information is considered to be trustworthy and reliable, and it is taken into consideration by consumers in their decision-making process. In the modern world, richness and variation in the consumers' information ecology force consumers to identify with credible information. To evaluate the credibility of information, consumers employ heuristics, such as consensus, since the agreement of the other consumers increases the credibility of the information (Metzger, Flanagin, and Medders 2010).

The consistency of information in consumer decision-making is also highlighted in several studies, and these studies are mostly related to online consumer reviews (e.g., Chevalier and Mayzlin 2006; Chintagunta Gopinath, and Venkataraman, 2010; Filieri 2015; Langan Besharat, and Varki 2016). The volume (number of reviews), the valence (average numerical rating), and variance are the primary areas of interest in understanding how information ecology affects the consumer decision-making process in online settings. Research on online rating variance is relatively sparse compared to studies on the online review valence.

Variance of the online ratings indicates a lack of consensus among consumers in online settings (Langan, Besharat, and Varki 2016). Lack of consensus indicates inconsistency in the available information. Therefore, it decreases the credibility of information in online settings. To increase the credibility of information, consumers engage in cross-validation of online information and validate the consistency by relying on offline sources (Metzger, Flanagin, and Medders 2010). Therefore, lack of consensus in offline settings on particular information plays an important role in the consumer decision-making process, since the offline consensus is an external heuristic and a tool for validating the credibility of information available online. Accordingly, the examination of consensus in offline information ecology deserves attention, since there is a significant gap in the subject in marketing literature.

WHAT IS CONSENSUS?

The term “consensus” is widely used in various fields, such as political science, management, and sociology. Although its meaning varies depending on the context, it generally indicates agreement among actors in a certain setting. For example, Markoczy

(2001) defines consensus as “the agreement in relevance beliefs and causal relationships” (p. 1017). In a similar vein, Illovsky (2013) defines consensus as “the degree to which other people react in the same manner as the person does to particular stimuli” (p. 135). It is less likely to observe absolute consensus when the number of options and individuals increase.

In my studies, the term “consensus” is used to indicate the level of agreement among consumers when they are asked to evaluate the quality of products. As aforementioned, a consensus among consumers is a neglected subject in the area of marketing, and the majority of studies are devoted to online consumer ratings. However, the studies in my dissertation focus on consensus in an offline setting and reflect the overall public opinion and consensus on quality. To shed light on the significance of the studies in my dissertation, it might be beneficial to compare similar topics in the marketing domain and highlight the major differences of consumer consensus on quality from others.

CONSUMER CONSENSUS ON QUALITY AND VARIANCE IN ONLINE REVIEWS

Mudambi and Schuff (2010) define online customer reviews as “peer-generated product evaluations posted on company or third-party websites” (p. 186). Several scholars indicate the positive relation between online consumer ratings and sales (Chevalier and Mayzlin 2006; Dellarocas, Zhang, and Awad 2007; Lee and Hitt 2008). Although online consumer ratings and their variance can serve as heuristics to make more confident judgments in consumer decision-making processes, they differ from consumer consensus on quality in many aspects.

Firstly, online consumer ratings reflect the overall judgment of consumers on a

product. It is an aggregated measure that might indicate satisfaction, perceived value, and the perceived quality of the product. Therefore, consumers, as receivers, might not interpret the quality from the online consumer ratings accurately since the weight of quality in an overall rating is not mentioned in online ratings. Moreover, the variance in the online ratings might not stem from the variance in the quality perceptions. As aforementioned, online rating is a function of various factors such as perceived value, satisfaction, and perceived quality. Therefore, although consumers in online settings have a consensus on the quality of a product, the other dimensions of online ratings, such as perceived value, can lead to an increase in the variance of online ratings. On the other hand, PQD is a more precise measure to understand than the agreement level of consumers in terms of their quality evaluations.

Secondly, dispersion in online platforms might result in different outcomes in the consumer decision-making process (King, Racherla, and Bush 2014). Platform dispersion can be defined as "the extent to which product-related conversations are taking place across a broad range of communities" (Godes and Mayzlin, p. 546). As online reviews are available on various online platforms, consumers' perceptions regarding the variation in the online consumer ratings are bound to the online platforms that they often visit. Considering the limited time resource of the consumers, their perception regarding the consensus on the quality of a product is a function of the number of the online platforms they visited. Therefore, the variance of online ratings might not reflect consensus on perceived quality in an unbiased manner.

Thirdly, the distribution of online ratings is driven by purchasing bias and under-reporting bias (Hu, Zhang, and Pavlou 2009). Consumers who have higher product

valuations are more likely to purchase a product and write a review. On the other hand, consumers with lower evaluations avoid the purchase decision, and they are less likely to provide reviews. Therefore, purchasing bias increases the positive skewness in online rating distribution (Hu, Zhang, and Pavlou 2009). In the case of under-reporting bias, reviewers who already purchased a product exhibit different review behavior than other reviewers who have not yet made a purchase. Reviewers who purchase a product are likely to provide extreme ratings, and other reviewers provide more moderate ratings (Hu, Zhang, and Pavlou 2009). Therefore the distribution of online ratings might not reflect the general consensus in society.

Lastly, fake reviews and bot activity are prevalent in online consumers ratings (Luca and Zervas 2016). Automated accounts and fake reviewers can provide extremely positive views related to a particular product and extremely negative reviews for its competitors. Therefore, variance in online ratings might prevent consumers from making accurate judgments on the consensus.

CONSUMER CONSENSUS ON QUALITY AND CONSUMER HETEROGENEITY

Heterogeneity studies represent another stream of research that focuses on the variation in consumer perceptions. Although it is widely used, there is no clear and widely-accepted definition of the term in the field of marketing. The majority of research on heterogeneity is devoted to the examination of the variation in consumers' tastes and preferences, which can be called customer heterogeneity. Smith (1956) is the pioneer of the authors who consider the idea of heterogeneity in the market (Floh, Zauner, Koller, and Rusch 2014). He argues that a heterogeneous market consists of smaller homogenous markets that involve different product preferences. According to DeSarbo et al. (1997),

consumers differ in their cognitive interpretation process (response heterogeneity), valuation of brand attributes (structural heterogeneity), perceptions, familiarity and recall (perceptual heterogeneity), utility function (form heterogeneity), utility distribution (distribution heterogeneity), and their reactions to their experiences and previous behaviors (time heterogeneity).

Consumer heterogeneity studies mainly focus on the segmentation of the market by identifying the number of homogenous groups in the market based on consumer preferences on various marketing metrics, such as perceived value. Therefore, studies on consumer heterogeneity focus on the nature of homogenous groups in heterogeneous markets. On the other hand, consumer consensus on perceived quality is related to the level of consensus among individuals and groups in a market. A heterogeneous market might be likely to have a lower level of consensus. However, the level of consensus among individuals as well as the level of consensus in a homogenous group are not areas of focus in this stream of research.

CONSUMER CONSENSUS ON QUALITY AND BRAND RATING DISPERSION

Brand rating dispersion is another stream of research that examines the variance in consumers' brand perceptions. Luo, Raithel, and Wiles's (2013) work is one of the few studies devoted to this area. According to Luo, Raithel, and Wiles (2013), brand dispersion can signal the heterogeneity of the brand's quality ratings, which can shed light on the inconsistency and polarization of brand lovers and haters. In their study, brand rating dispersion is measured by taking six indicators into account: perceived brand quality, brand value, brand satisfaction, brand recommendation, brand effect, and workplace reputation. Therefore, rather than measuring consensus on perceived quality,

the brand dispersion studies focus on the variance in the constituents of brand rating. Therefore, brand dispersion studies focus more on cohesion rather than consensus.

This dissertation consists of two essays on the consensus in product quality. The first essay focuses on the antecedents of consensus on the perceived quality. The impact of the average perceived quality ratings, brand age, and advertising expenditures on the consensus of quality is examined. Moreover, PQD's impacts on the consumers' perceived quality evaluations, purchase intentions and brand level sales are investigated. Lastly, moderation effects of PQD on the relationship between (1) advertising and sales, (2) advertising and purchase intention, (3) perceived quality and sales, and (4) perceived quality and purchase intention are examined.

In the second essay, I examine the short-term and long-term impact of consensus on perceived quality. Moreover, I delve into how the short-term and the long-long term impact of consensus on quality differ when the hedonistic and utilitarian aspects of the products are considered. Lastly, the differences in the short-term impact and the long-term impact of PQD on perceived quality in service and product categories are examined.

ESSAY 1 - PERCEIVED QUALITY DISCREPANCY: ANTECEDENTS AND CONSEQUENCES

INTRODUCTION

Although the concept of consensus is not new in marketing, the 2009 economic downturn had a negative effect the formation of consensus among consumers, as consumers have become more cost-conscious and risk-averse (Adamson, Dixon, Spenner, and Toman 2015). The challenge of forming consensus can be observed in both industrial and consumer markets. According to research by CEB Inc., on average, 6.8 people are involved in a B2B purchase decision (Toman, Adamson, and Gomez 2017), and therefore, salespeople have to build consensus among those individuals to create a purchase decision.

Consensus may also catalyze the purchase behavior for consumer goods even though it is harder to predict the total number of individuals who influence a purchase decision in a B2C setting. Evaluating the quality of products and services is a difficult task for consumers (Kopalle, Fisher, Sud, and Antia 2017; Wilcox, Roggeveen, and Grewal 2011). They need external clues to make more accurate judgments on the quality of products and services. Therefore, consumers are more prone to be influenced by the information disseminated from external resources since industrial buyers are well-informed and more rational than consumers. Moreover, consumers are less accustomed to weighing product attributes than industrial buyers are. Therefore, consensus among consumers is worthy of attention, even though marketing scholars have examined the phenomenon mostly in the industrial-buying processes.

Creating consensus among consumers is one of the big challenges facing brands.

Empirical evidence suggests consumers actively abstain from traditional marketing instruments (Hann, Hui, Lee, and Png 2008; Hinnz, Skiera, Barrot, and Becker 2011). Moreover, numerous and diverse information resources influence consumers' attitudes toward brands. Peers, online reviews, social networks, opinion leaders, and public opinion have become more influential, and there has been an explosion in the impact of communication technologies on consumers, firms, and marketplaces (Yadav and Pavlou 2014). On one hand, abundance in the available resources regarding brands has increased consumers' dependence on convenient external resources. On the other hand, information overload and contradiction in the information provided by different resources have made the consumers' buying process more complicated and has left consumers wrapped in uncertainty. Therefore, the chaotic and complicated information environment forces consumers to find a balance between the attractiveness and ambiguity of the option.

A noticeably absent area of marketing literature is consensus in the quality of brands. In the same way, the mechanism that enables firms to decrease the perceived quality discrepancy (PQD) among consumers has not yet been fully examined. Although some studies examined the value of heterogeneity by considering the different dimensions of value, such as price and quality (e.g., Desarbo, Jedidi, and Sinha 2001), these studies solely evaluated recent users who are more familiar with the objective quality of products and services. Therefore, heterogeneity studies did not incorporate the perceptions of non-users who have the potential of affecting the purchase decisions of other consumers. Moreover, rather than focusing on the antecedents of the discrepancy, heterogeneity studies principally focused on capturing segments based on different dimensions of quality, such as reliability and consumer service (Blanchard, DeSarbo,

Atalay, and Harmancioglu 2012; Desarbo, Jedidi, and Singa 2001). Another stream of research, which might be considered to be relevant to the focus of this study, is brand rating dispersion studies. Previous research on brand rating dispersion does not solely focus on the dispersion in perceived quality. To fill this gap in the literature, I examined the lack of consensus in perceived quality evaluations of consumers in a society, which will be referred to as PQD in the rest of this paper. More specifically, I examined the role of the sharply contrasting sets of opinions regarding the quality in the purchase process and other factors that mitigate the discrepancy on quality evaluations.

My research makes several contributions to the literature. First, this is the first study to employ PQD in consensus perspective. Second, previous research on perceived quality examined the determinants of perceived quality and the impact of perceived quality on purchase intention and sales. However, the relationship between PQD and perceived quality, and PQD's impact on purchase intention and sales have not been studied via a dataset that enables the researcher to measure consumer consensus by responses from a large number of consumers. Therefore, this research examines whether the PQD is a matter for consumers in terms of their purchase behavior in a less biased manner.

Third, although the marketing literature is rich in studies regarding perceived quality, there is a limited number of longitudinal studies that analyze the phenomenon. Marketing scholars have emphasized that it is essential to conduct longitudinal studies to evaluate the marketing metrics (Aaker and Day 1986; Golder 2000). In a similar vein, Mitra and Golder (2006) have indicated the lack of studies regarding the perceived quality of cross industries rather than relying on a single company or experimental

research. Therefore, this study contributes to the literature by analyzing PQD by using longitudinal models across many product and service categories.

My research aims to contribute to the marketing literature by answering the following questions:

- What is the relationship between perceived quality and PQD?
- What is the relationship between advertising expenditures and PQD?
- Do established brands have lower PQD?
- Does PQD matter? Is there a relationship between PQD and (1) sales (2) purchase intention?
- Does perceived quality moderate the relationship between PQD and (1) sales (2) purchase intention?
- Does PQD moderate the relationship between advertisement expenditures and (1) sales (2) purchase intention?

The remainder of the paper is as follows: First, I will provide the definitions of the constructs. Second, I will present hypotheses on the literature. Third, I will introduce the data that is used in my study. Fourth, I will provide the methodology and the model. Fifth, I will provide the results. And finally, I will conclude with managerial implications and future research.

DEFINITIONS OF KEY CONCEPTS AND LITERATURE REVIEW

Perceived Quality

Scholars have paid close attention to perceived quality and its determinants in marketing literature. As one of the essential dimensions of brand equity (Aaker 1996),

many scholars have come up with different definitions of the phenomenon. One of the widely accepted definitions of perceived quality is “the customer’s perception of the overall quality or superiority of a product or service with respect to its intended purpose relative to alternatives” (Aaker 1991, p. 85). Although conceptualization of the quality varies by disciplines, it tends to stand for perceived quality in marketing literature (e.g., Bolton and Drew 1991; Parasuraman, Zeithaml, and Berry 1985; Rust, Moorman, and Dickson 2002).

Perceived quality is different from objective quality since objective quality is solely related to intrinsic cues. Intrinsic cues in quality are defined as “product-related attributes that cannot be manipulated without also altering physical properties of the product” (Richardson, Dick, and Jain 1994, p. 30). Perceived quality judgments are not only affected by intrinsic cues but also extrinsic cues such as word-of-mouth. Perceived quality reflects the consumers’ subjective judgment on aggregate benefits of a product’s quality (Zeithaml. 1988). Consumers evaluate the products’ attributes based on their own criteria, and they come to a conclusion regarding the quality of the products. Although perceived quality and objective quality are different concepts, objective quality is one of the drivers of perceived quality (Mitra and Golder 2006).

Firms allocate remarkable resources to improve consumer perceptions of brand quality since perceived quality is a key component of the consumer’s decision-making process (Rust, Zahorik, and Keiningham 1995). Previous studies in the literature regarding perceived quality report that it has a positive impact on purchase likelihood (Steenkamp, Batra, and Alden 2003; Erdem, Swait, and Valenzuela 2006), and it increases the likelihood of being considered by consumers (Swait and Erdem 2007).

Similarly, perceived quality has a positive impact on stock returns (Aaker and Jacobson 1994; Mizik and Jacobson 2004) and a negative impact on idiosyncratic risk (Bharadwaj, Tuli, and Bonfrer 2011).

Perceived Quality Discrepancy

In marketing literature, the majority of studies focused on marketing metrics by taking the average data. However, since consumers are heterogeneous in their preferences, aggregated data does not provide the optimum results (Jedidi, Jagpal, and DeSarbo 1997). A limited number of studies in the literature take alternative approaches and rely on alternative metrics to explain consumer decision-making processes rather than using the average of the metrics. Although these studies possess some similarities, the terms used by authors and their scales are not in harmony with each other. Heterogeneity and dispersion are commonly-used concepts by the authors.

Heterogeneity in perceived quality is used for explaining how numerous subgroups differ in their preferences toward disparate dimensions of quality. A widely acknowledged study by DeSarbo, Jedidi, and Sinha (2001) uses the term heterogeneity to indicate the variety of consumer priorities regarding dimensions of service quality. Similarly, Zhou, Brown, and Dev (2009) used the term heterogeneity to refer to how groups of consumers differ in terms of their emphasis on service quality and price in their perceived value evaluations.

Dispersion is another term that is employed to indicate the deviation in brand metrics. Luo, Raithel, and Wiles (2013) use the term to refer to the overall standard deviation of brand rating dimensions, and these involve quality, value, satisfaction, brand

recommendation, brand effect, and workplace reputation for a certain brand.

Variation in customer perceptions is a critical area for the outcomes of marketing activities. Several authors have stated that variety in consumer perceptions can produce different outcomes for brands. DeSarbo, Jedidi, and Sinha (2001) suggest that consumers are heterogeneous in weighing the dimensions of service quality, and this leads to heterogeneity in perceived value. Similarly, Adner and Zemsky (2006) assert that new products and units can be created by considering the heterogeneity of consumer tastes. Moreover, heterogeneity in consumer tastes and preferences affects the market orientation of a firm (Zhou, Brown, and Dev 2009).

Although heterogeneity and dispersion studies do not focus on the variance of perceived quality evaluations, the traces of a similar approach can be found in the variance of online user rating studies. These studies focus on the variance of online consumer ratings. Findings of this relatively new research stream produce conflicting results. Sun (2012) found that variance of online ratings had a positive impact on demand when the average rating is low for a product. On the other hand, Wang, Liu, and Fang (2015) considered variance of ratings as a double-edged sword and postulated that variance could help or hurt sales performance depending on the deviation of critical reviews and other quality signals. Although this study similarly focusses on the variance of online consumer ratings, the focus of this study is different from the studies that focus on the variance of online ratings. Online user ratings measure the overall performance of the product rather than focusing on perceived quality. Also, the findings of these studies do not fully reflect the perceptions of non-users. Moreover, the online reviews are biased since ratings reflect the perception of consumers who are enthusiastic about sharing their

experience and it is hard to eliminate the fake reviews. However, this study focuses on consensus in quality perceptions of non-users and users of products. Table 1 illustrates the main studies focused on the heterogeneity, variance of online ratings, and brand rating dispersion.

Since this study focuses on consensus in quality perceptions of both users and non-users of products, I define PQD as a lack of consensus in perceived quality evaluations in a market. Based on previous studies related to quality, PQD might stem from two different components. The first component of PQD is the consumer-related factors since the phenomenon is related to the subjective judgments of consumers. For example, consumers vary in their available time and their motivation in their evaluations processes regarding quality (Aaker 1996). This leads to an increase in PQD. In a similar vein, situational, comparative, and individual factors can give rise to PQD (Holbrook and Corfman 1985).

The second component of the PQD is firm-related factors. Inconsistent and short-winded marketing activities can lead to a discrepancy. Previous studies on perceived quality show that promotions have an impact on uncertainty about brand quality (Winer 1986). Buil, De Chernatony, and Martinez (2013) assert that short-term promotion campaigns, insufficient in building long-term brand associations, have a negative impact on brand perception. Similarly, the longevity of advertisement campaigns and the variety of their channels (above-the-line, such as mass media advertisement, versus below-the-line, such as viral videos) may lead to a discrepancy in perceived quality.

Advertising Expenditures

In marketing literature, a significant amount of research is devoted to the impact of advertising expenditures on various performance metrics. Previous studies report the significant relationship between advertising and brand sales (e.g., Clarke 1976; Baghestani 1991; Pauwels 2004), market share (e.g., Bronnenberg, Mahajan, and Vanhonacker 2000; Srinivasan, Leszczyc, and Bass 2000), brand awareness (Clark, Doraszelski, and Draganska 2009), and financial measures (e.g., Pauwels 2004).

Several studies emphasized that advertising expenditures enable firms to signal their quality (Nelson 1974; Kihlstrom and Riordan 1984; Milgrom and Roberts 1986; Zhao 2000). However, studies on the relationship between advertising expenditures and perceived quality produce conflicting results. For example, Moorthy and Zhao (2000) find a positive relationship between advertising expenditures and perceived quality in their study. On the other hand, Clark, Doraszelski, and Draganska (2009) concluded that the relationship is insignificant in their longitudinal study with 348 brands. Similarly, Buil, De Chernatony, and Martinez (2013) report an insignificant relationship between advertising expenditures and perceived quality in their study.

Saturation (Chu and Keh, 2006), the emergence of new media (Wang, Zhang, and Ouyang 2009), quality of the marketing program (Keller and Lehmann, 2003), and the objective quality of products are some of the explanations for the conflicting results on the relationship between advertising and perceived quality. Emphasizing the quality of advertising is beneficial for high-quality brands in terms of objective quality; however, quality-based advertising is not an efficient strategy for brands that have low-objective quality (Kopalle, Fisher, Sud, and Antia 2017). Therefore, using advertising expenditures

to increase perceived quality is a more efficient strategy for high-quality brands than low-quality brands.

Although some studies shed light on the relationship between advertising expenditures and perceived quality, none of the studies that I am aware of have examined the relationship between advertising expenditures and PQD.

Purchase Intention

Purchase intention reflects the subjective tendency to purchase a product, and it is an important measure to predict consumer behavior (Fishbein and Ajzen 1977). Although there is an ongoing debate about how well purchase intention reflects actual purchase behavior (Morwitz, Steckel, and Gupta 2007), it is widely used by managers to predict consumer behavior in various cases such as segmentation (Glen and Hauser 1993), advertising, and promotions (Bird and Ehrenberg 1966). In the same way, academic researchers widely use purchase intention as a proxy for purchase behavior.

In marketing literature, the relationship between perceived quality and purchase intention is well-established. Marketing scholars indicate a positive relationship between perceived quality and purchase intention (e.g., Grewal, Krishnan, Baker, and Borin 1998). In this study, I focus on whether the discrepancy on perceived quality evaluations also impacts consumer purchase intentions.

Brand Age

Brand age is an important element of product characteristics. Continuity of a brand in a market can signal the success of the brand (Chatterjee and Chaudhuri 2005).

Since consumers are exposed to older brands for longer periods of time, the age of the brand may be an important factor that can influence the PQD. The consumers' minds are not a blank sheet for the products, and they hold conscious and unconscious memories regarding the brands (Vakratsas, Demetrios, and Ambler 1999). Therefore, the role of brand age in PQD is also investigated in this study.

THEORY AND HYPOTHESES

Negative Impact of PQD on Perceived Quality

Quality evaluation is a rigorous process for consumers. It requires technical knowledge of various quality dimensions since it is difficult for consumers to make a judgment on quality without cues. Therefore, consumers rely on quality cues that would enable them to have more accurate evaluations and use these cues as a risk reduction strategy in order to decrease uncertainty (Zhu and Zhang 2010). These cues can be classified as intrinsic cues and extrinsic cues (Olson and Jacoby 1973). Intrinsic cues are related to product attributes such as ingredients that cannot be altered without changing the physical features of the product (Richardson, Dick, and Jain 1994). On the other hand, extrinsic cues are related to attributes that are not linked with physical features of the product (Richardson, Dick, and Jain 1994). Brand name, price, and peer reviews can serve as extrinsic cues to make more accurate quality evaluations. Consumers primarily rely on intrinsic cues when they formulate evaluations since they are considered more useful than extrinsic cues (Purohit and Srivastava 2001). However, extrinsic cues are dominant when consumers have limited or irrelevant information (Suri and Monroe 2003; Miyazaki, Grewal, and Goodstein 2005).

In the quality evaluation process, consumers consider the predictive value and the

confidence value of the cue. The predictive value of the cue represents the association degree of a cue with product quality, and the confidence value is related to the degree of consumers' self-confidence in their capability to evaluate the quality of a product (Olson and Jacoby 1973). The social environment of the consumer provides extrinsic cues that help consumers to make more accurate judgments when they are evaluating quality. Social influence modifies judgment formation when individuals compare their judgments against their social surroundings (Aronson 1980; Deutsch and Gerard 1955; Zalesny 1990). The impact of social influence might not be equally distributed since various factors take part in the modification of the judgment (Zalesny 1990).

The role of social influence on product quality is acknowledged by marketing scholars. For example, Myers and Sar (2013) highlighted the positive impact of social approval cues on consumers' brand evaluations. As consensus on the quality of a product indicates lack of social approval, consensus information acts as a salient cue in the product evaluation process (Chang 2010). Social influence increases when there is a plurality of support for a particular position (Strasser, Kerr, and Davis 1980; Zalesny 1990). Therefore, consumers might modify their product quality judgments for products that have a certain level of consensus in a positive manner. Similarly, lack of consensus on product quality might decrease consumers' quality judgments due to the lack of social approval.

Lack of consensus might also decrease the confidence value of consumers in their quality judgments by providing less extrinsic cues. A position that is supported by society is considered informative because individuals generally treat majority views as a reflection of reality (Deutsch and Gerard 1955; Chang 2010). Since individuals tend to

rely on the beliefs that are prevalent in society (Jetten, Postmes and McAuliffe 2002; Paluck 2009), lack of consensus on quality might lead to ambiguity and trigger risk-aversion in the quality evaluation process. Considering the positive relationship between ambiguity tolerance and perceived quality (e.g., Hazen, Overstreet, Jones-Farmer, and Field 2012), I hypothesize the following:

H_1: There is a negative relationship between PQD and perceived quality.

Negative Impact of Advertising Expenditures on PQD

Advertisement serves as a source of information for consumers to make more accurate quality judgments. Previous research on the value of advertisement states that consumers find advertisements more valuable when the advertisement is informative (Ducoffe 1995). Similarly, Rotzoll, Heafnell and Sandage (1989) state that there is consensus on the informational role of advertising.

Advertising plays a key role in shaping consumers' quality attributes, and it leads to informational beliefs (Steenkamp 1990). Investing in advertising increases shared information. Although consumers' exposure to advertisements can result in different reactions, some consumers are attentive to the message, and they are willing to learn implied meaning if they are persuaded (Shareef et al. 2018). Eventually, the mass communication of a position regarding a product can lead to the creation of a group opinion (Shareef et al. 2018). Therefore, heavy advertising helps firms to decrease the discrepancy regarding the quality attributes of their consumers due to the salient information provided by a single source.

Moreover, advertising is also a fundamental tool that enables firms to create

word-of-mouth regarding their brands. Consumers often communicate information with their peers to impress others, regulate their emotions, acquire information, create social bonds, and persuade others (Berger 2014). According to Berger and Schwartz (2011), the level of word-of-mouth activity increases when it is triggered by the environment. Highly-advertised brands are likely discussed more often during the social interactions of consumers (Dichter 1966) since more frequent advertising enables products to stay in the top-of-the-mind of consumers (Berger 2014).

Accordingly, a high level of word-of-mouth activity and similar associations drawn from advertisements might facilitate the convergence of perceived quality evaluations due to the corrective function of group discussions; hence, a higher-level advertisement expenditure can build consensus among consumers about quality.

Therefore, I hypothesize the following:

H_2: There is a negative relationship between advertising expenditures and PQD.

Negative impact of brand age on PQD

The longevity of the brand can lead to consensus on quality since consumers are exposed to established brands for a longer time. Once consensus on quality judgments is built among consumers, the overall judgment can be institutionalized and create a carry-over effect for the prospective judgment—unless there is no major change in the nature of the product or a new alternative for the product is launched by a competitor.

Maintaining operation in the market also represents experience and a sense of permanence in consumers' minds (Fill 2009). Along with consistent marketing activities, associations regarding the brand are transmitted from one generation to another (Urde,

Greyser, and Balmer 2007).

Moreover, since the oldest brands in product categories are the first movers, these brands may serve as anchors concerning quality, and consumers might evaluate the late mover brands by comparing them with the first mover brands. Although objective quality and perceived quality change over time (Mitra and Golder 2006), the longevity of the brand leads to the stickiness of quality evaluations.

H_3: There is a negative relationship between brand age and PQD.

The Impact of PQD on (1) Sales and (2) Purchase Intention

The ambiguity of the option is one of the crucial factors that shapes the consumer decision-making process. Ambiguity reflects the conflicting or unreliable evidence, which leads to uncertainty about an outcome (Ellsberg 1961). The variety of subjective judgments on an option increases the ambiguity of the option. (Allen 1965; Lascu and Zinkhan 1999). Ambiguity also has an impact on confidence in a decision (Allen 1965).

Consumers' confidence in their decisions decreases when the option is ambiguous. Moreover, the ambiguity in decision-making leads to conformity to the group (Allen 1965; Ross, Bierbraurer, and Hoffman 1976). An individual's typical response to ambiguity is to choose the option that has the least ambiguity when all the choices only differ in their level of ambiguity (Curley and Yates 1989).

Since consumers are sensitive to the cues that are provided by other consumers (Bearden and Rose 1990), a lack of consensus on the quality of a product increases the ambiguity on the products' quality. In other words, inconsistent external cues on the quality of a particular product might trigger the ambiguity. The previous studies on

ambiguity show that people are in favor of the less ambiguous choice in their decision-making process (Curley, Yates, and Abrams 1986; Halevy 2007). This phenomenon is known as ambiguity avoidance (Ellsberg 1961). In their experimental study, Muthukrishnan, Wathieu, and Xu (2009) found that ambiguity aversion is evident in a marketing setting. This study demonstrated that participants are in favor of more-established brands when the overall quality and familiarity are controlled. Rather than overall quality judgments, the degree of confidence regarding quality judgments is the reason for the favorability of the more established brands. In a similar vein, higher PQD might decrease the confidence of quality judgments on a brand since there is a lack of consensus on quality perceptions in the consumers' social environment.

Moreover, ambiguity avoidance can act as a social norm in the consumer decision-making process since consumers assume that other consumers are averse to ambiguity (Kocher and Trautmann 2013). To avoid the occurrence of feelings such as regret and anxiety associated with uncertainty (Bell 1982, 1983), consumers might refrain from more ambiguous brands in terms of quality.

Therefore, I hypothesize the following:

H_{4a}: There is a negative relationship between PQD and sales.

H_{4b}: There is a negative relationship between PQD and purchase intention.

Moderating Impact of Perceived Quality on the Relationship between PQD and (1) Sales (2) Purchase Intention

Consensus on quality might not affect the products that have different qualities at the same level. Consumers' involvement might change the consumers' information

search process as well as their need for external cues to make more accurate judgments. Involvement indicates a continuous interest, rather than temporary enthusiasm, stemming from purchase requirements. (e.g., Bloch, Sherrell, and Ridgway 1986; Tsiotsou 2006). Previous research on involvement asserted that there is a direct link between involvement and search behavior (e.g., Bloch and Richins 1983; Bloch, Sherrell, and Ridgway 1986; Tsiotsou 2006). Due to the correlation between involvement and search behavior, more involved consumers require more information in their decision-making process. Therefore, these consumers are more enthusiastic to elaborate the external cues in their environment. Accordingly, more involved consumers are more likely to sense consensus on product quality than their less involved counterparts.

According to Tsiotsou (2006), perceived quality is a function of involvement. Products that are considered to be high quality are more likely to reflect the high level of consumer involvement. As the more involved consumers might be more sensitive to consensus in their environments, the impact of consensus on sales and purchase intention might be higher for the products that have higher perceived quality.

Therefore, I hypothesize the following:

H_{5a}: Perceived quality negatively moderates the relationship between PQD and sales.

H_{5b}: Perceived quality negatively moderates the relationship between PQD and purchase intention.

The Positive Moderating Impact of PQD on the Relationship between Advertising and (1) Sales (2) Purchase Intention

Advertising influences consumers' utilities and affects consumers' brand evaluations and their prospective decision-making process regarding brand choice (Mehta, Chen, and Narasimhan 2008). The informative role of advertising is widely acknowledged by marketing scholars (Bagwell 2007; Fishbein and Ajzen 1975; Lavidge and Steiner 1961). Therefore, advertising serves as an external cue in the consumer decision-making process. The advertising elasticity might decrease when consumers are more informed and more certain about the quality of the product. For instance, Basuroy, Desai, and Talukdar (2006) state that consumers' reliance on advertising decreases when information provided by an independent source becomes available. Mehta, Chen, and Narasimhan (2008) found that informative advertising elasticities are higher for the brands that have higher consumption ambiguity.

Since consensus on quality might serve as a reliable cue in consumers' decision-making process, consumers might rely on advertisements to gather information when there is no consensus regarding the quality of a product. Therefore, advertisement elasticity might be higher for the products that have a lower level of consensus on their quality.

Therefore, I hypothesize the following:

H_{6a}: PQD positively moderates the relationship between advertising and sales.

H_{6b}: PQD positively moderates the relationship between advertising and purchase intention.

METHODOLOGY

Sample and Data

To test my hypotheses, I used the Harris Poll EquiTrend Survey and Superbrands reports between 2004 and 2008. Advertising expenditures, sales, perceived quality, and purchase intention variables are gathered from Superbrands reports. Harris Interactive surveys gathered between 20,000 and 45,000 respondents to examine perceptions regarding consumer purchase intention and perceived quality evaluations for approximately 1,000 brands, and each respondent rates approximately 100 brands (Clark, Doraszelski, and Draganska 2009). The cumulative scores are adjusted by proper weights based on the demographic information of consumers and shared in Superbrands with the previous year's advertisement expenditures taken from TNS Media Intelligence and Competitive Media Reporting. TNS compiles cumulative advertisement expenditures regarding various media: magazines, newspaper, television, and radio (Clark, Doraszelski, and Draganska 2009). Individual responses of the Harris Poll EquiTrend Survey are used to calculate PQD and number of ratings. Lastly, the age of brands is calculated from the World Intellectual Property Organization Global Brand Database (WIPO).

Measures

The PQD is calculated by a standard deviation of perceived quality scores of individual-level data, which is taken from the Harris Poll EquiTrend Survey. Harris Poll asks respondents to rate the quality of brands by using a Likert scale, where 0 indicates poor quality and 10 indicates outstanding quality. The Harris Poll EquiTrend is one of the

most widely-used databases that measures brand perceptions along several dimensions (Datta, Ailawadi, and van Heerde 2017). A higher standard deviation indicates a lack of consensus on the quality of the brand in society. On the other hand, a low standard deviation indicates that there is a salient perception in society regarding the perceived quality of the brand.

The EquiTrend study is used for purchase intention. Purchase intention is measured by asking the respondents whether they intend to have a future relationship with a brand using a 1 to 4 scale (1 indicates never, and 4 indicates absolutely). The individual answers are converted to aggregated scores and published in Superbrands.

The number of individual-level ratings is measured by calculating the total number of individuals who state their quality perceptions regarding a brand for each year. To capture brand age, the WIPO Global Brand Database is used since brands are required to register their brands as intellectual property within the grace period to maintain their rights to use the brand name (Jayachandran, Kaufman, Kumar, and Hewett 2013). The registration year for a brand as a trademark is used to measure the age of the brand. I used a log of advertising expenditures to calculate the advertising expenditure. Similarly, I used the sales log to calculate the sales variable.

Dummy variables are used for controlling the year effect and segment effect in the study. I used StataMP 14 in my analysis. Table 2 illustrates the categories in the dataset, and Table 3 presents the correlations and descriptive statistics.

Model Formulation

To test the hypotheses in this study, I used a three-stage estimation for systems of

simultaneous equations for two reasons. Firstly, some variables are used as both dependent variables and independent variables in different regressions, and this raises concerns for endogeneity (Morgan and Rego 2009). Moreover, overlap in each equation leads to correlations among the errors in different regression equations, and a system of regression provides a flexible and easy way to interpret the methodological framework (Morgan and Rego 2009).

The system of equation estimated is as follows: PI is the consumers' purchase intention; S is the brand level sales; PQD is the perceived quality discrepancy; ADV is the log of advertisement expenditures; AGE is the brand age; NR is the total number of individual ratings; SEGMENT is a dummy variable that identifies the parent company of the brand; YEAR is a dummy variable that identifies the year; "i" is the brand; "t" is time, and "u" is the error term. The hypotheses are tested between two separate models. Model 1 is designed for testing the hypotheses regarding the sales. Similarly, Model 2 is designed for testing the hypotheses regarding purchase intention. Since dependent variables in each equation are highly correlated with their one-year lag (see Figure 1), I added a one-year lag of each dependent variable to the equations.

Model 1:

$$S_{it} = S_{it-1} + PQ_{it-1} + PQD_{it-1} + ADV_{it-1} + AGE_{it} + NR_{it} + SEGMENT_{it} + YEAR_{it} + u_{Sit} \quad \text{(Eq1)}$$

$$PQ_{it} = PQ_{it-1} + PQD_{it-1} + ADV_{it-1} + AGE_{it} + NR_{it} + SEGMENT_{it} + YEAR_{it} + u_{PQit} \quad \text{(Eq2)}$$

$$PQD_{it} = PQ_{it-1} + PQD_{it-1} + ADV_{it-1} + AGE_{it} + NR_{it} + SEGMENT_{it} + YEAR_{it} + u_{PQDit} \quad \text{(Eq3)}$$

Model 2:

$PI_{it} = PI_{it-1} + PQ_{it-1} + PQD_{it-1} + ADV_{it-1} + AGE_{it} + NR_{it} + SEGMENT_{it} + YEAR_{it} + u_{PIit}$

(Eq4)

$PQ_{it} = PQ_{it-1} + PQD_{it-1} + ADV_{it-1} + AGE_{it} + NR_{it} + SEGMENT_{it} + YEAR_{it} + u_{PQit}$ (Eq5)

$PQD_{it} = PQ_{it-1} + PQD_{it-1} + ADV_{it-1} + AGE_{it} + NR_{it} + SEGMENT_{it} + YEAR_{it} + u_{PQDit}$ (Eq6)

An examination of the variance inflation test indicated that there is no problem with multicollinearity in the models since the variance inflation factor is below the standard cut-off. The Breusch-Pagan test indicated that there is no overall system heteroscedasticity in the three-stage simultaneous equation models (Shehata 2011).

RESULTS

Table 4 and Table 5 present the results for the simultaneous equations models: Model 1 and Model 2, respectively. Since I used a 1-year lag for each dependent variable in each equation and segment dummy, the R square of each equation is high. More specifically, the R squares of the equations in Model 1 are .96, .78, and .89 for the Eq 1, Eq 2, and Eq 3, respectively. Similarly, the R squares of the equations in Model 2 are .93, .85, and .89 for Eq 4, Eq 5, and Eq 6, respectively.

The models produced results that are in line with the marketing literature that examines the role of advertising expenditures in the consumer decision-making process (e.g., Clarke, 1976; Baghestani, 1991; Pauwels 2004). As Table 4 indicates, the relationship between advertising expenditures and sales is significant and positive (β= .16, $p<.01$). Similarly, the results confirm the positive and significant relationship

between advertising expenditures and purchase intention as indicated in Table 5 (β= .02, p<.01).

As aforementioned, the previous research on the relationship between advertising expenditures and perceived quality provide conflicting results. Table 4 and Table 5 indicate a positive and significant relationship between advertisement expenditures and perceived quality (β=.02, p<.01 in Model 1, and β=.02, p<.01 in Model 2). Contrary to the studies that find an insignificant relationship between advertising expenditures and perceived quality (e.g., Buil, De Chernatony, and Martinez 2013; Clark, Doraszelski, and Draganska 2009), the results are in line with the studies that state a positive relationship (Moorthy and Zhao 2000).

As Table 4 shows, brand age has a positive impact on the brand level sales (β=.00, p<.01). On the contrary, the relationship between brand age and purchase intention is insignificant, as shown in Table 5. The impact of brand age on perceived quality is also insignificant in both models.

In line with previous research on the relationship between perceived quality and sales, Table 4 indicates a positive and significant coefficient (β= .45, p<0.01). Similarly, the relationship between perceived quality and purchase intention is positive and statistically significant, as shown in Table 5 (β= .32, p<0.01). This finding is also in line with previous research on the relationship between perceived quality and purchase likelihood (e.g., Erdem, Swait, and Valenzuela 2006; Steenkamp, Batra, and Alden, 2003).

In Hypothesis I, I postulated a negative relationship between perceived quality and PQD. As expected, the relationship is significant in both models (β= -.22, p<0.01 in

Model 1, and $\beta = -.16$, $p<0.01$ in Model 2). Therefore, Hypothesis 1 is supported. The lack of consensus in perceived quality evaluations has a negative impact on average perceived quality evaluations for the consecutive year. The significant relationship highlights the heuristic role of consensus in perceived quality in quality evaluations.

Although the coefficient is negative, the results did not confirm a significant relationship regarding Hypothesis 2, which states a negative relationship between advertising expenditures and PQD. An examination of the non-linear relationship between advertising expenditures and the PQD did not indicate a significant relationship. Therefore, I failed to find support for Hypothesis 2. One of the possible explanations of the insignificant result might be related to selection bias in the sample. Hypothesis 2 is built on word-of-mouth activity and similar associations that consumers make from advertisement campaigns. As the brands reported by Adweek were examined in the analyses, and Adweek reports the bestseller brands in their segment, the majority of the brands in the sample represent the brands which have high familiarity scores in markets in the United States. Therefore, the examination of popular brands might diminish the impact of advertising expenditures on PQD.

As Table 4 and Table 5 indicate, the coefficient of brand age in Eq 3 and Eq 6 is negative but insignificant. Therefore, I fail to find support for Hypothesis 3, which states a negative relationship between brand age and PQD. One of the reasons for this insignificant result might stem from the sample used in the analyses. Since the majority of the brands in the sample are well-established brands and the number of young brands is limited, it is possible that the impact of the brand age on PQD for brands in their very early stage might not be captured.

In line with the ambiguity averseness perspective, these results indicate that consumers tend to abstain from ambiguous brands in terms of quality. As is shown in Table 4, the coefficient of PQD in Eq 1is negative and significant (β= -.31, $p<0.05$). Therefore, Hypothesis 4a, which states the negative impact of PQD on brand-level sales, is supported. Similarly, Table 5 indicates a negative and significant relationship between PQD and purchase intention (β= -.23, $p<0.01$). Therefore, Hypothesis 4b has support.

The results confirmed a negative and significant moderating effect of perceived quality on the relationship between PQD and purchase intention (β= -.18, $p<0.05$ in Model 2, and β= -.13). In other words, the heuristic role of consensus in consumers' quality judgment might be more pronounced in situations where consumers evaluate high-quality products. The moderating effect is demonstrated in Figure 2. Therefore, Hypothesis 5b is supported. However, I failed to support Hypothesis 5a, which states a negative moderating effect of perceived quality on the relationship between PQD and sales.

Considering consumers' need for extrinsic cues in quality evaluations, I postulated that advertisement expenditures increase sales and purchase intentions more for the products that have a lower level of consensus in Hypothesis 6a and Hypothesis 6b, respectively. The results in Table 4 confirm the moderating role of PQD in the relationship between advertising expenditures and sales (β= .17, $p<0.01$). Therefore, Hypothesis 6a is supported. The moderating effect is demonstrated in Figure 3. However, I fail to find to support for Hypothesis 6b where the dependent variable is purchase intention. One of the possible explanations for the insignificant moderating role of PQD on the relationship between advertising expenditures and purchase intention might be the

lack of financial risk related to purchase intention. Consumers might be more sensitive to external cues when there is a chance of a negative financial outcome related to their decisions. Purchase intention does not involve any financial loss. Therefore, the moderating impact of PQD on the relationship between advertising expenditures and purchase intention might diminish. The lack of financial risk in the decision-making regarding purchase intention might diminish, yet it is a significant moderator in the relationship between advertising expenditures and sales.

Result Robustness

In this study, I used three-stage estimation for systems of simultaneous equations. To check the validity of the findings in the study, each model tested via a two-stage estimation for systems of equation (2SLS), seemingly unrelated regression (SURE), and ordinary least squares regression (OLS). The results for each method are shown in Table 6a, Table 6b for two stage-estimation for systems of equation, Table 7a and Table 7b for seemingly-unrelated regression, and Table 8a and Table 8b for ordinary least squares regression. The evaluation of the models in different estimation methods indicates the robustness of the findings.

DISCUSSION

The main goal of the study is to investigate whether consensus on quality evaluations should be considered to improve consumers' purchase intentions and sales at the brand level. The results suggest that consensus on quality has a positive impact on the consumer decision-making process since the relationship between PQD and purchase intention, and the relationship between PQD and sales at brand level, is negative and

significant.

Besides the direct impact of consensus on the quality evaluation on sales and purchase intention, the results suggest that increasing consensus on quality evaluations might increase sales and purchase intention by modifying quality evaluations in a positive manner since there is a negative relationship between PQD and perceived quality. Moreover, improvement in the perceived quality evaluations increases consensus among consumers, as there is a negative relationship between the previous year's perceived quality score and the current year's PQD. Therefore, higher average perceived quality scores result in an increase in consensus among consumers in the next year.

Since consumer involvement is higher for products that have a high quality, consumers focus on the consensus on quality more when a product has a higher quality. Therefore, the consensus on quality might be more effective as a cue in the process of quality judgments for high-quality products.

In line with the heuristic role of consensus on quality, the advertisement expenditures might be more effective to increase sales for products that have a lower level of consensus on quality. In other words, consumers who use consensus on quality as a cue might rely on advertisements in their decision-making process, as the results confirm the moderating role of PQD on the relationship between advertising expenditures and sales. On the other hand, an insignificant moderation coefficient of PQD on the relationship between advertising expenditures and purchase indication might stem from lack of financial risk when consumers express their purchase intention. As a decision involves less financial risk, consumers might be less willing to use cues provided by their information ecology.

CONCLUSIONS AND IMPLICATIONS OF THE RESEARCH

The findings of this research contribute significantly to the literature and have the potential to offer new insight to managers. First, I introduce a new concept that might be crucial to consider in the process of designing efficient marketing mix strategies. More specifically, managers should consider increasing consensus regarding the perceived quality of their brand's portfolio rather than solely increasing the aggregated perceived quality. Focusing on consensus on quality might result in a higher average of perceived quality scores for the prospective quality evaluations since consumers' perceptions are always in a state of flux.

Along with the heuristic role of quality judgment processes, consensus on quality also plays a crucial role in consumers' purchase decision-making processes. Considering the negative relationship between PQD and sales in the analyses, it might be appropriate to acknowledge the heuristic role of consensus on quality in purchase situations. As consumers are risk and ambiguity averse, focusing on consensus on quality will help firms decrease ambiguity regarding the quality of the product and provide a more salient cue to the consumers in their purchase situations. Eventually, more salient cues regarding quality might improve sales. Therefore, marketing managers need to take appropriate action to manage the discrepancy to attract consumers.

One of the remedies for lack of consensus on quality is to improve perceived quality scores as the results of the analysis in this essay indicate. Another remedy can be related to marketing communication. Marketing managers might prioritize the consistency in marketing efforts in the process of communication of quality. Similarly, control of the message in marketing campaigns might be crucial. Communication of the

quality message via traditional communication channels might be more efficient to control consensus on quality rather than communicating the quality with viral marketing campaigns where firms have less control of the message. Moreover, managers might expend extra effort to deal with the lack of consensus in situations where products have a higher level of quality. To reach a higher level of consensus for products that have been highly evaluated by consumers, they should be prioritized after considering the perceived quality scores of all products in the product portfolio.

Another managerial implication of the findings of this research is related to the prediction of sales. Managers might consider adding the level of consensus in their models used for sales projection. In doing so, they might make more accurate projections for prospective years.

The results suggest that advertising is more effective to boost sales when there is a lack of consensus on quality. Since consumers are ambiguity averse and rely on external cues to decrease ambiguity, the role of advertising to decrease ambiguity becomes more salient in situations where there is a lower level of consensus on the quality of the product. Therefore, it might be more efficient to adjust the advertising budget after considering the level of consensus on the product in the market.

LIMITATIONS

In interpreting the contributions of the research, several limitations should be considered. Firstly, the data source provides information regarding brands that have higher market shares in their segments. Therefore, some specialist brands that have low market shares are not investigated in the study due to limitations regarding the data. Brands that have higher market shares have higher levels of familiarity, and possibly, a

higher level of consensus. The bias in the sample might lead to an underestimation of the impact of advertising expenditures on PQD. Similarly, the impact of brand age on the PQD might be underestimated since the firms that have high market shares are mostly established brands.

Another limitation of the study is related to advertising expenditures. The total number of advertising expenditures are used to test the hypotheses in the study. Since different combinations of the communication channel and content might be used for each brand in the sample, the heterogeneity in the communication channel and content is neglected in the analysis.

Similarly, objective quality is not taken into account in the study. The gap between objective quality and perceived quality might result in a lack of consensus. Moreover, an increase in objective quality led to higher perceived quality scores. Therefore, the addition of objective quality scores might lead to a more accurate estimation of coefficients in the models.

Although the dataset consists of many product and service categories, I rely on the overall quality score of each product for perceived quality and a standard deviation of the individual perceived quality scores for PQD. Although I controlled the product and service categories in the models, the measurement of the perceived quality scores does not take the difference in the dimensions of product and service quality into account.

FUTURE RESEARCH

PQD is a concept that requires more studies that will shed light on a different dimension of the phenomenon. Due to the data limitation, this study does not examine the content of advertisements and their impact on PQD. Quality-based advertisement

messages provide different outcomes due to the variety in objective quality in product categories (Kopalle, Fisher, Sud, and Antia 2017). Therefore, a future study examining quality-based advertising messages and their impact on the discrepancy of perceived quality is highly warranted.

In the analysis, the impact of advertisement expenditure on discrepancy was examined. Future studies can examine the relationship between advertising channels (e.g., TV advertising, journal advertising, viral campaigns) and PQD. It would especially be beneficial to examine viral advertising campaigns since consumers' interaction with the advertising message will create variety in the message. Moreover, future studies can examine how variety in advertising channels affects PQD and whether marketing managers can optimize the combination of advertising channels to decrease PQD.

Future research could also examine the phenomenon by taking product characteristics into consideration. The hypotheses provided in this research can be extended by focusing on the type of goods (e.g., search goods versus experience goods) since the quality evaluation process is different for each product's characteristics.

Quality gap is another area that could lead to fruitful studies on PQD. The objective quality of the product is not used in my study. Therefore, a longitudinal study that examines the relationship of the quality gap between perceived quality and objective quality and its impacts on PQD is highly warranted.

ESSAY 2 - THE IMPACT OF PQD ON PERCEIVED QUALITY: SHORT-TERM AND LONG-TERM EFFECTS

INTRODUCTION

One key determinant of a firm's success is being perceived by customers as a high-quality brand. To achieve this goal, firms use various tools, such as improving its objective quality and communicating the quality. As consumers are not capable of predicting the true quality of every product (Mitra and Golder 2006), their perceptions of quality are the main factors that shape their decision-making process.

Although marketing managers might focus on improving the customer's perceptions about quality, they need to emphasize creating a consensus among customers to increase perceived quality, purchase intention, and sales rates as the results in the previous section suggest. Considering the impact of PQD on perceived quality, the question of under what conditions PQD serves as an extrinsic cue for consumers in their quality judgment processes has been an unexplored area in the marketing literature.

Consumers are also limited in terms of perceiving the changes in their information ecology. Since quality perceptions are in a state of flux, it takes time for consumers to realize the change in the perceptions of others. Moreover, as availability-diagnosticity theory states (Bone 1995; Feldman and Lynch 1988), consumers rely on previous information retrieved from their environment when they make judgments. Therefore, the longevity of consumer consensus and its impact on consumers' quality judgments are crucial areas to investigate.

The research devoted to the longevity of marketing efforts has been growing in the domain of marketing. For example, Jedidi, Mela, and Gupta (1999) examined the

long-term impact of advertising and promotion on profitability. Feldman and Lynch (1988) investigated the short-term and long-term impact of word-of-mouth information on consumers' product judgments. Similarly, Mitra and Golder (2006) shed light on the short-term and long-term impact of objective quality on perceived quality. None of the research that I am aware of focused on the short-term and long-term impact of consumers' consensus on perceived quality. To fill this gap in the literature, I investigated the short-term and long-term impact of PQD on perceived quality. Moreover, differences between the short-term and long-term effects for the products and services are examined in this study. Besides the differences in service and product categories, I have investigated the short-term and long-term impact of PQD on perceived quality by taking hedonistic and utilitarian aspects into account.

One of the limitations of the studies regarding the short-term and long-term impact of branding metrics is related to sample size and duration since few studies investigated the impact of these factors using experiments or longitudinal studies with a limited duration (Mitra and Golder 2006). In this study, I used a large data set that consisted of various product and service categories. Moreover, the short-term and long-term impact of PQD on perceived quality allows the tracking of change in customers' consensus and perceived quality over a time period of 11 years.

In this study, I aim to contribute to the marketing literature by answering the following questions:

- What is the impact of PQD on perceived quality in the short term?
- What is the impact of PQD on perceived quality in the long term?

- Is the impact of PQD on perceived quality higher for the service categories in the short-term?
- Is the impact of PQD on perceived quality higher for the service categories in the long term?
- Does the impact of PQD on perceived quality differ for the hedonistic and utilitarian products in the short term?
- Does the impact of PQD on perceived quality differ for the hedonistic and utilitarian products in the long term?

The rest of the paper is organized as follows: I highlight the motivation of the research by reviewing the relevant literature. Second, I present key definitions regarding the short-term and long-term impact of PQD on perceived quality. Third, I develop the hypotheses of the study. Fourth, I present the model, data collection process, and variables. Fifth, I present the results of the analysis and discuss the findings. I conclude with limitations, managerial implications, and future research.

LITERATURE REVIEW

Perceived quality is a widely-used term to indicate consumers' subjective judgments on the quality of products. Golder, Mitra, and Moorman (2012) define the quality evaluation process as "customers compare an offering's perceived attributes with their expectation to evaluate aggregate quality and satisfaction" (p. 3). Since perceived quality depends on the consumers' ideal expectations of a particular attribute performance, the consumers' interpretation of quality attributes varies (Golder, Mitra, and Moorman 2012). Therefore, expectations of the consumers are the key factor that

leads to the variance in their quality judgments. The higher variance in the expectation will lead to higher PQD in their quality evaluation processes.

While the heterogeneity in quality attributes of products has been examined (e.g., Jedidi, Jagpal, and DeSarbo 1997), the variance of overall quality evaluations has not received attention. On the other hand, a similar approach to understanding the nature of the variance in the consumers' perceived quality can be observed in studies devoted to the variance of online consumer ratings.

In this stream of research, the impact of the variance of online ratings on various performance metrics has been investigated. In their study on the craft beer industry, Clemons, Gao, and Hitt (2006) find a positive correlation between the variance of the online ratings and sales growth. Similarly, Moe and Trusov (2011) find a positive relationship between the variance of the online ratings and sales in the fragrance category. They also state that the social dynamics of online reviews increase the variance of the ratings. The variance of online ratings was also examined by Sun (2012). According to Sun (2012), the variance of online ratings increases the sales rank of a book if the average rating is lower than 4.1 stars out of 5. On the other hand, some studies indicate a negative relationship between the variance of online ratings and sales. For example, Zhu and Zhang (2010) reported that the impact of the variance of online rating on sales is only significant in less popular online games, and the relationship is negative. Zhang's (2006) study on the relationship between the variance of online ratings and revenue indicated an insignificant link between the two. Therefore, the studies on the relationship between the variance of online ratings and sales led to conflicting results.

Considering the conflicts in the findings regarding the link between the variance

of the online ratings and sales, He and Bond (2015) examined the moderators of the relationship between the variance of the online ratings and consumer judgments. The authors reported that the relationship between the variance of online ratings and consumers' judgments depends on product characteristics, such as taste similarity. They concluded that when consumers perceive the source of the variance is taste dissimilarity, the consumers' attributed the variance to the reviewer characteristic. Moreover, the authors reported that the negative impact of the variance on product evaluations is weaker for the taste-dissimilar products. In a related vein, Park and Park (2013) found the variance of online ratings is interpreted differently based on the target product's search and the experience attributes in their experimental study. For experience goods, the variance improves the consumers' judgments. On the other hand, the impact of the variance depends on the persuasiveness and prior expectations of the consumers for search goods.

De Langhe, Fernbach, and Lichtenstein (2015) examined the relationship between the variance of online ratings and objective quality. The authors stated that online user ratings converge with the Consumer Reports' quality ratings when the standard error of online user ratings decreases. The authors calculated the standard error of the online user ratings via the standard deviation of online user ratings and the number of reviews. Their results indicate that the convergence stems from the number of reviews rather than the standard deviation of the ratings. Therefore, the authors argue that online consumer reviews are not a valid estimator for the objective quality of a product. Although standard deviation of online ratings does not reflect the consensus on quality in the market because of the biases of online ratings (Schoenmueller, Netzer, and Stahl 2017), the study

indicates an insignificant link with the standard deviation of the online user ratings and objective quality.

Along with studies devoted to online consumer ratings, some studies examined the variance in the quality ratings in offline settings, which is closer to the main area of this study. In an experimental study where the quality of restaurants was pre-given, Meyer (1981) found that the variance in quality mattered when the quality was high. Therefore, consumers' utility functions are more sensitive to changes in the variance of the quality for high-quality products. West and Broniarczyk (1998) emphasized the role of customers' prior expectations when they encountered a certain level of disagreement in the information provided. In their study on movie critics, the authors demonstrated that the level of disagreement in critics led moviegoers to watch the movie when they had high expectations for a movie. On the other hand, when moviegoers had low expectations for a movie, they chose to go to movies that had lower levels of disagreement.

The role of consensus in consumer decision making is also highlighted by scholars who have examined consensus claims. Since it is common for consumers to build their preferences by considering consensus-related cues (Maheswaran and Chaiken 1991), firms engage heavily in sending consensus-related information to change consumer preferences (Wang, Zhu, and Shiv 2012). Previous studies in this stream of research have shown that the consensus claims sent by marketers improve the effectiveness of advertisements and consumers' purchase intentions (Aaker and Maheswaran 1997; Chang 2007). In a similar vein, consensus claims are influential in purchase likelihood and product evaluations (e.g., Bearden and Etzel 1982; David 2016; Wang, Zhu, and Shiv 2012). Consensus claims can serve as a tool that helps consumers

determine their position when they compare themselves with others (Verplanken and Holland 2002).

The research devoted to the consensus implies that the consensus serves as a cue in consumers' decision-making process. However, inconsistent findings in consensus research indicate the presence of boundary conditions that shape the relationship between consumers' consensus and consumers' product assessments. Considering the previous research in this domain, it can be concluded that the setting of the study (online vs. offline), product characteristics, and individual differences among consumers, such as attachment (e.g., David, 2016), are influential in consumers' perceptions and reactions to the consensus. Moreover, previous studies on the consensus are limited in terms of the number of products evaluated by the participants, the settings, and the considered timeframe. Therefore, the examination of the consensus on quality with a large dataset fills a significant gap in the literature.

In a similar vein, focusing on the consensus in general—rather than examining the phenomenon via experimental studies or online consumer ratings—gives rise to a holistic approach that considers the factors that affect the consensus and its impact on product judgments. In other words, word-of-mouth research measures the consensus that is generated by the users or marketers. However, in daily life, there are various cues that would shape the consumers' consensus perceptions. These cues might not be expressed directly by marketers or consumers. These implied cues regarding the consensus might change the customers' perception; specifically, when the heterogeneity in consumers' willingness to share information is considered. For example, Feick and Price (1987) state that some consumers are "market mavens," which can be described as "individuals who

have information about many kinds of products, places to shop, and other facets of markets and initiate discussions with consumers and respond to the request from consumers for market information" (p. 85). Market mavens are more likely to engage in information-sharing activities. In a similar vein, their information-sharing proneness is observed in online settings (Ho and Dempsey 2010). Accordingly, the studies that evaluate the consensus in online settings via secondary data are not free of selection bias in ratings. Therefore, as in this study, calculating the consensus on quality with a large dataset that is collected by reaching consumers might lead to a less biased measure.

"Consensus" is a concept in a state of flux. It can be traced in public opinion, politics, and even science. Consumers update their judgment when there is a discrepancy between their prior judgment and new information (Park and Park 2013). Therefore, the consensus on quality shapes the expectations of consumers in their subsequent product judgments. Considering limitations regarding observation duration in the studies devoted to this domain, this study fills a significant gap in the literature by examining the impact of the consensus on consumers' quality judgments for a longer duration.

In order to evaluate the long-term and short-term impact of PQD on perceived quality, I followed an approach similar to Mitra and Golder's (2006). In their study, the authors evaluated the impact of objective quality on perceived quality and demonstrated the short-term and long-term effects. This approach is routinely used in marketing literature (e.g., Clarke, 1976; Mela, Gupta, and Lehman 1997; Mitra and Golder, 2006; Mitra and Golder, 2008; Tellis, Chandy, and Thaivanich 2000).

Similarly, in this study, the contemporaneous effect, short-term effect, short-term carryover effect, long-term effect, and long-term carryover effect of PQD on perceived

quality are evaluated (Mela, Gupta, and Lehman 1997; Tellis, Chandy, and Thaivanich 2000).

DEFINITIONS

The contemporaneous effect indicates the impact of the current year's PQD on the perceived quality. In other words, it shows how PQD affects the perceived quality in the very short term. The short-term effect involves not only the current year but also shows the impact of the subsequent year. Therefore, the short-term effect shows the total impact of the current year and the subsequent year. In line with Mitra and Golder's (2006) study, short-term carryover demonstrates the difference between the effect of the subsequent year and the current year.

For the long-term impact of PQD on perceived quality, the long-term effect and long-term carryover are examined in this study. The long-term effect indicates the cumulative effect of PQD on the perceived quality given an infinite duration of time. Long-term carryover shows the difference between long-term and short-term effects. Carryover duration can be defined as "the time needed to reach a prespecified percentage of the long-term effect" (Mitra and Golder 2006, p. 231).

THEORY AND HYPOTHESES

It is generally argued that the dispersion in consumers' product experience is undesirable (He and Bond 2015; Matz and Wood 2005; Urbany, Dickson, and Wilkie 1989). Although there is an inconsistency in the findings of empirical studies devoted to the domain of variance in consumer ratings, I argue that a higher level of variance in consumers' judgment increases the ambiguity of the external cue.

According to Rust, Inman, and Jia (1997), consumers have prior expectations on

the distributions of brands' average quality. These distributions are updated by experiences which would affect consumers' prospective decisions (Wirtz and Matilda 2001). As perceived quality is a function of the consumer expectations for products (Mitra and Golder 2006) and services (Parasuraman Zeithaml, and Berry 1988), perceived quality changes due to changes in consumer expectations over time. Consumers' consensus changes as a result of the variety of consumers' expectations, personalities, and information ecology. Therefore, consumers' perceived quality and consensus influence each other. Since consumers abstain from inconsistency and process the lack of consensus on quality in the market as an ambiguous heuristic cue, I expect a negative contemporaneous and short-term carryover effect of PQD on perceived quality. Therefore, I hypothesize the following:

H_{1a}: There is a negative contemporaneous effect of PQD on perceived quality.

H_{1b}: There is a negative short-term carryover effect of PQD on perceived quality.

Decision makers rely on external cues like advice for several reasons, such as gaining information, framing their decisions, refining their preferences, and creating extra options (Yaniv and Milyavsky 2007). Therefore, they update their judgments about product quality by considering the opinion of other consumers. Therefore, consumers shape their decisions by considering their experiences and cues created by their information ecology. Previous research on quality demonstrates that consumers update their judgments by relying on mental accounting principles (Bolton and Lemon 1999). In this process, customers consider their past perceptions and expectations to shape their current expectations about a product (Boulding, Kalra, Staelin, and Zeithaml 1999;

Johnson, Anderson, and Fornell 1995; Kopalle and Lehman 2006; Rust, Inman, and Jia 1997). Therefore, I expect a negative long-term effect and long-term carryover effect of PQD on perceived quality. I hypothesize the following:

H_{2a}: There is a negative long-term effect of PQD on perceived quality.

H_{2b}: There is a negative long-term carryover effect of PQD on perceived quality.

Consumers rely on intrinsic and extrinsic cues when they are forming their judgments on quality. Products provide more intrinsic cues related to quality since they are tangible. Therefore, product markets are dominated primarily by intrinsic cues (Miyazaki, Grewal, and Goodstein 2005). Markets dominated by intrinsic cues are less complicated than the markets where the reliance is on the extrinsic cues (Bloom 1989). Since products have more tangible cues, assessing the quality of services is more complicated than evaluating the quality of products (Parasuman, Zeithaml, and Berry 1985). Due to the lack of intrinsic cues in service markets, quality expectations are shaped by extrinsic cues (Boulding, Kalra, and Staelin 1999). Moreover, Consumers' need for information is higher in service markets (Desai, Kalra, and Murthi 2008).

Consumers might primarily rely on PQD to make an accurate assessment of quality where there is a lack of intrinsic cues. Accordingly, I expect that the reliance on PQD is higher in services than in products when consumers are assessing quality. Therefore, I hypothesize the following:

H_{3a}: The contemporaneous effect of PQD on perceived quality is higher for services.

H_{3b}: The short-term effect of PQD on perceived quality is higher for services.

H_{3c}: The long-term effect of PQD on perceived quality is higher for services.

The inconsistent findings related to consensus in online ratings literature might indicate that the impact of consensus on consumer behavior might depend on product type. One of the prevalent classifications of goods in marketing literature is the distinction of goods based on their hedonistic and utilitarian attributes. Previous research indicates that the hedonic and functional considerations of consumers are important drivers of the decision-making process (Childers, Carr, Peck, and Carson 2001; Dhar and Wertenbroch 2000; Hirschman and Holbrook 1982; Lee and Hyman 2008; Okada 2005). Hedonistic considerations are related to fantasies, fun, feelings, and excitement (Holbrook and Hirschman 1982; Mano and Oliver 1993), whereas utilitarian considerations are related to needs and necessities that satisfy the prevention of goals of the consumers (Chernev 2004; Chitturi, Raghunathan, and Mahajan 2008; Kivetz and Simonson 2002).

Consumers' perceptions and their post-consumption behavior in regard to hedonistic and utilitarian goods are different in nature. According to Chitturi, Raghunathan, and Mahajan (2008), delight is the dominant feeling post-consumption when the performance of a product exceeds consumers' expectations. On the other hand, for utilitarian products, consumers exhibit satisfaction behavior when a utilitarian good exceeds consumers' expectations. In a similar vein, the authors argue that consumers experience different feelings in the post-consumption process of hedonistic and utilitarian goods. The negative feeling associated with the failure of meeting minimum expectation is dissatisfaction for hedonistic goods. Chitturi, Raghunathan, and Mahajan (2008) state

that the failure of utilitarian expectations evokes anger, which is relatively high when aroused. Therefore, when the product categories were compared, the value function of the prospect theory could be considered steeper for utilitarian products. Since the consumers are risk-averse in nature, the impact of a lack of consensus on perceived quality might be higher for utilitarian goods than hedonistic goods.

Another distinction between goods in marketing literature is made by comparing affect-rich and affect-poor dimensions (Hagtvedt and Patrick 2009). Hedonic goods are rich in affect-rich properties, and utilitarian goods are considered affect-poor. Affect-rich products are primarily assessed based on the feelings they evoke, whereas, affect-poor products are evaluated based on rational decision making (Schwarz and Clore 1983). Therefore, consumers rely on their feelings when they are judging the quality of hedonic goods, and they employ a more rational process when they are evaluating utilitarian goods. Accordingly, consumers might be more sensitive to external cues and take PQD into consideration in their judgment process of utilitarian attributes, while feelings are the primary input in the quality evaluation process of hedonic attributes. Therefore, the impact of PQD on perceived quality might be higher for the utilitarian goods.

Moreover, consumers tend to blame themselves, not the manufacturer, in the case of the failure of hedonistic expectations, such as style and visual appeal (Chitturi, Raghunathan, and Mahajan 2008). On the other hand, consumers tend to attribute failure to the manufacturer in the case of utilitarian expectations (Chitturi, Raghunathan, and Mahajan 2008). Therefore, word-of-mouth is generally more intense in utilitarian goods than in hedonistic goods when the attribution of the failure and level of arousal are considered (Chitturi, Raghunathan, and Mahajan 2008). Therefore, consumers might be

more aware of the lack of consensus in product categories where utilitarian expectations are dominant. Accordingly, I hypothesize the following:

H_{4a}: The contemporaneous effect of PQD on perceived quality is higher for the utilitarian goods.

H_{4b}: The short-term effect of PQD of PQD on perceived quality is higher for the utilitarian goods.

H_{4c}: The long-term effect of PQD on perceived quality is higher for the utilitarian goods.

METHODOLOGY

Model

In order to evaluate the impact of PQD on perceived quality, direct and contemporaneous effects are examined. For a similar approach, see Mitra and Golder (2006). At any given time, the direct impact of PQD on perceived quality can be described as following:

$$PQ_{it}=\gamma_{0i}+\gamma_{0i}+\gamma_{1i}\,PE_{it}+\gamma_{2i}\,PQD_{it}+e_{it}\,,$$

where PQ is the perceived quality of a product, PE is prior expectations regarding the quality, and PQD is perceived quality discrepancy. In the equation, "t" and "i" stand for time and product, respectively.

The basic premise of the model is that consumers update their quality perceptions, and this leads to a contemporaneous link. The change in expectations in the model regarding the carryover effect will be in proportion to the difference between prior expectations and prior perceived quality, and it is less than the difference (Boulding, Kalra, Staelin, and Zeithaml 1993; Mitra and Golder 2006; Kopalle and Lehman 2006).

$$E_{it}-E_{it-1}=\beta\ (PQD_{it-1}-PE_{t-1}) \qquad 0<\beta<1.$$

The combination of the two equations leads to the final model (Mitra and Golder, 2006).

$$PQit=\gamma_{0i}+\gamma_{1i}\,PQ_{it-1}+\gamma_{2i}\,PQD_{it}+\gamma_{3i}\,PQD_{it-1}+e\text{it}$$

I followed Mitra and Goldberg's (2006) approach in the model-building process. In their study, the authors examined the impact of objective quality on perceived quality. The authors' premise in their study is that consumers' perception update process is subject to delays due to their uncertainty regarding the objective quality and the required cognitive effort to revise their expectations. As consumers are not fully certain about the aggregate level of consensus on the quality of the market and they need to spend cognitive effort to adjust their expectations, their approach can be applied to the model. Mitra and Goldberg's (2006) model is also useful since it enables calculations of the contemporaneous effect, short-term effect, long-term effect, short-term carryover, long-term carryover, and carryover duration. These effects are formulated as follows (For details, please see Mitra and Golder (2006)):

The contemporaneous effect= γ_{2i}

The short-term effect= $\gamma_{2i}+\gamma_{3i}$

The long-term effect= $(\gamma_{2i}+\gamma_{3i})/(1-\gamma_{1i})$

The short-term carryover= γ_{3i}

The long-term carryover= $\gamma_{1i}\,(\gamma_{2i}+\gamma_{3i})/(1-\gamma_{1i})$

The duration of carryover of PQD $= \frac{\ln(1-dc)-\ln[(\gamma_{3i}+\gamma_{1i}\gamma_{2i})/(\gamma_{2i}+\gamma_{3i})]}{\ln(\gamma_{1i})}+1$

In this equation, dc% refers to the time required to observe dc% of the cumulative effect (Clarke 1976; Mitra and Golder 2006).

Measures

Perceived quality, which is the dependent variable of the model in the study, is measured by the Harris Poll Equitrend Survey. The Equitrend Survey is one of the most widely-used databases for assessing brand perceptions of consumers in the United States (Datta, Ailawadi, and van Heerde, 2017). The Equitrend Survey measures perceived quality by using a Likert scale, where 0 indicates poor quality and 10 indicates outstanding quality. The yearly perceived quality score of each brand is calculated by taking the average of the quality scores.

Similarly, I used the Equitrend Survey to calculate the PQD scores for each brand. For each year and brand, I used a standard deviation of the individual quality ratings. The variance of the consumer ratings is used broadly to calculate consensus among consumers (e.g., Sun 2012; West and Broniarczyk 1998).

For the related hypotheses that compare the long-term and short-term impact of PQD on perceived quality in service markets and product markets, each brand in the Equitrend Survey identified the base on their service and product attributes. The difference in the impact can be evaluated using two models. Only the service brands are used to calculate and evaluate the short-term and long-term impacts on service markets. Similarly, only the product brands are used for calculating the scope of the impact on product categories. Therefore, the brands used in each model are mutually exclusive. Also, coefficients are calculated via “statsby” command in Stata to check their robustness.

For the hedonic and the utilitarian scores of the product categories, I relied on an experimental study. Since the classification of the categories might be subjective, the hedonistic and utilitarian scores of SuperBrand’s product categories are calculated. The

following process is implemented in the experimental study.

Undergraduate students at a major U.S. university participated for course credit. 32 product categories were randomly chosen from the SuperBrand. Each student evaluated the hedonistic and utilitarian attributes of the product categories. The number of participants that evaluated the categories ranged from 47 to 49. I used Voss, Spangenberg, and Grohman's (2003) scale to measure the hedonic and utilitarian scores of the categories in the experimental study. The scale consists of 10 items, and a seven-point Likert-type format ranging from "not all" to "extremely" was used for these items. The participants were asked to rate to what extent a category was effective, helpful, functional, necessary, practical, fun, exciting, delightful, thrilling, and enjoyable. As expected, effective, helpful, functional, necessary, and practical loaded on the same factor (utilitarian). Similarly, fun, exciting, delightful, thrilling, and enjoyable loaded on the other factor (hedonic). All the loadings were above the critical cut-off point (.50) with minimal cross-loadings. Cronbach's Alpha was .93 for utilitarian construct and .93 for hedonistic construct, which indicates the reliability of the scale.

Using the utilitarian and hedonistic scores (Crowley, Spangenberg, and Hughes 1992), I identify the categories high in hedonistic scores and low in utilitarian scores to obtain the hedonistic categories used in the models related to Hypothesis 4a, 4b, and 4c. More specifically, product categories that are above the 50th percentile in terms of their hedonistic scores and lower than the 50th percentile in terms of their utilitarian scores are considered as hedonic. Similarly, categories that are above the 50th percentile in terms of their utilitarian scores and lower than the 50th percentile in terms of hedonistic scores are considered as utilitarian products. Based on the factor analysis scores, the following

products were chosen as hedonic categories: cookies, energy drinks, fragrances, ice cream, liquors, salty snacks, orange juice, and yogurt. The utilitarian categories were as follows: bar soap, diapers, detergent, facial tissue, shampoo, small appliances, toothpaste, toilet tissue, and pharmaceutical products.

The model consisting of only utilitarian categories and the model consisting of only hedonistic categories were compared to evaluate whether there is a difference in the short-term and long-term impact of the PQD on perceived quality for utilitarian and hedonistic goods in terms of magnitude.

RESULTS

In Hypothesis 1a and 1b, I propose a negative contemporaneous effect and carryover effect of PQD on perceived quality. As Table 11 indicates, the coefficients regarding the contemporaneous effect and carryover effect are negative and significant (β=-.97, $p<.001$ for γ_2, β=-.53, $p<.001$ for γ_3). Therefore, the results support Hypothesis 1a and 1b. Previous studies on the variance of the ratings indicate inconsistent results since the authors in this research stream focused on one product category. I delve into the relationship between consumer consensus on the quality and average quality judgments by examining the relationship with a dataset that consists of 1144 brands. The results support the findings of the authors who state the negative impact of the variance in consumer product judgments (e.g., He and Bond 2015; Zhu and Zhang 2010).

In Hypothesis 2a and Hypothesis 2b, I postulated a negative long-term carryover and long-term effect of PQD on perceived quality. As is shown in Table 11, coefficients regarding long-term carryover and the long-term effect are significant: β=.16, $p<.001$ for $\gamma1$, β=.-97, $p<.001$ for $\gamma2$, and β=--.53, $p<.001$ for $\gamma3$. Therefore, Hypothesis 2a and

Hypothesis 2b are supported. The variance of the consumers' product judgments not only affect the perceived quality in the short term, but it also decreases the quality judgments of the consumers in the long run. The results indicate a carryover duration of 1.84 years. The previous research on the variance of the online ratings evaluated the phenomenon for a short period of time, as these studies focused on the online environment.

In Hypothesis 3a, Hypothesis 3b, and Hypothesis 3c, I state the contemporaneous effect, short-term effect, and long-term impact of PQD on perceived quality is higher for services. As expected, the contemporaneous effect of PQD is higher for service categories. The contemporaneous effect of PQD for services is β=-.98 ($p<.001$). The effect for products is β=--.95 ($p<0.001$). Similarly, the short-term effect is higher for services than products (-1.51, and -1.48, respectively). Therefore, Hypothesis 3a and 3b are supported.

As Table 12 states, the long-term effect of PQD is higher for product categories (-1.79 for service brands and -1.80 for products). Therefore, Hypothesis 3c is not supported. Moreover, the carryover duration for products is higher than services (the carryover durations are 1.78 years for services and 1.89 years for products). Brands that have at least 10 years of observation considered the carryover duration can reach 2.51 years for products, and 1.98 years for services (please see Table 13).

Hypothesis 4a proposes a larger contemporaneous effect of PQD for utilitarian products. As Table 14 indicates, the coefficient regarding the contemporaneous effect is higher for the hedonistic goods (β=--.66, $p<0.001$ for utilitarian goods and β=--.94, $p<0.001$ for hedonistic goods). Similarly, the short-term effect is higher for the hedonistic goods (the short-term effect is -1.49 for utilitarian goods and -1.68 for hedonistic goods).

The coefficient of lagged perceived quality is insignificant when only hedonistic and utilitarian products are considered (please see Table 14). Therefore, I fail to support Hypothesis 4c.

DISCUSSION

In this research, I aimed to investigate the relationship between PQD and perceived quality for the short-term and the long-term, and I examined how this relationship differs for different brands belonging to different categories. Considering the number of brands evaluated in the sample, this empirical study provides results that would be more generalizable than other studies devoted to the variance of consumer judgment literature. The examination of the 1144 brands over a period of 11 years sheds light on the short-term and long-term impact of PQD on perceived quality.

The results suggest that PQD has a negative short-term and long-term impact on perceived quality. Therefore, the consensus level of quality in any time has a carryover effect on the prospective quality judgments of the consumers. On average, a consensus level has a carryover duration of 1.84 years.

Moreover, the impact of PQD on perceived quality shows differences when the product and services aspects are considered. The short-term effect is higher for the service brands. On the other hand, the carryover duration is longer for the product brands. The effect of a change in PQD on perceived quality is carried over 1.89 years for products, while the carryover duration is 1.78 years for the service brands. In the analysis, I analyzed the brands that have at least five years of observation in the dataset. More parsimonious analyses with the brands that have at least 10 years of observation data resulted in a bigger gap between the carryover duration of products and services

(carryover duration is 1.98 years for services and 2.51 years for products). The main reason for the longer carryover duration for products is the higher level of the long-term carryover effect, stemming from the relationship between the perceived quality and its lag. Therefore, a change in consumer consensus is realized in the service categories in the shorter term, while consumers realized changes in the consensus in a longer period of time.

PQD has a negative short-term impact on the perceived quality of utilitarian and hedonic goods. The contemporaneous effect of PQD in hedonic goods is higher than its contemporaneous effect in utilitarian goods. Similarly, the short-term effect is higher in the hedonic product categories. However, the results indicate that PQD's long-term impact on perceived quality is insignificant in both the hedonic and utilitarian categories due to the insignificant relationship between perceived quality and its one-year lag as it is shown in Table 14.

MANAGERIAL IMPLICATIONS

The findings of the study have several managerial implications. First, the variance of the quality evaluations is an important phenomenon that managers should address. Moreover, negligence of the consensus in quality evaluations not only harms quality perceptions in the short term, but it also impairs the perceived quality in the long run. Therefore, managers should focus on creating consensus among the customers to increase the perceived quality of their brands. Delivering consistent messages when communicating quality is critical in order to sustain the consensus on quality.

Second, consumers pay more attention to the consensus on the quality of services rather than the products; our results indicate a higher short-term effect of PQD in service

categories. Therefore, consumers rely on consensus regarding quality as an extrinsic cue in their quality evaluation process. Accordingly, managers might put more emphasis on decreasing the variance of the quality of service brands in their brand portfolio. Similarly, the intangible dimensions of the service quality might be more critical than the tangible dimensions.

Finally, the variance of the quality evaluations might be more critical in hedonic goods, as the results suggest a lower contemporaneous and short-term impact on utilitarian goods. Therefore, marketing efforts to create a consensus on quality might better be directed to hedonic goods to allocate the marketing budget more efficiently.

LIMITATIONS AND FUTURE RESEARCH

In the present study, I examined the short-term and long-term impact of the PQD on perceived quality. Some important factors that might affect the magnitude of the short-term and the long-term impact are not evaluated. For example, the price, which is one of the major cues that signal quality, is not examined in the present study. Since the main assumption of the study is that consumers use the consensus on quality as an external cue when they assess the quality of products, it might be beneficial to examine the impact of the consensus on the quality at different price levels. Similarly, the objective quality of the products is not examined in the study. As previous research indicates a positive relationship between objective and perceived quality, the impact of consumer consensus on quality can be assessed by taking the objective quality into account. Moreover, how the quality gap – differences between objective quality and perceived quality – affects consumer consensus is a fruitful area of research.

As previous research indicates a positive relationship between perceived quality

and firm performance, the impact of the consumer consensus on firm performance might be examined. Similarly, the relationship between the consensus on the quality and the volatility of stock prices is another area that deserves marketing scholars' attention. Moreover, examination of the impact of consumer consensus on firm performance and volatility of the stocks in different brand portfolio structures might lead to a highly-valued contribution to practitioners and the marketing literature.

APPENDIX

Table 1 – Sample Studies Focusing on Heterogeneity, Brand Rating Dispersion, and Online Review Variance

Study	Contribution	Sample and Data
Jedidi, Jagpal, and DeSarbo (1997)	• Rather than using aggregated data, consumer heterogeneity in value evaluations should be considered in SEM models.	1564 customers for home shopping club in Europe
DeSarbo, Jedidi, and Sinha (2001)	• Customers are heterogeneous in evaluating the dimensions of service quality.	1509 cases in 15 months for an electric utility company
Adner and Zemsky (2006)	• Companies can offer new products and strategically diversify in a market by exploiting the heterogeneity in customer value perceptions.	Modeling Study
Zhou, Brown, and Dev (2009)	• Heterogeneity in customer value perceptions regarding service quality and price affects firm's market orientation.	Survey Data with 184 Hotel Managers
Grewal, Chandrashekaran, and Citrin (2010)	• There is a negative relation between objective quality and heterogeneity in satisfaction. • Relative advertising increases the heterogeneity in satisfaction. • Heterogeneity in satisfaction decreases the shareholder value and volatility in shareholder value.	Longitudinal Study on 7 Airline Brands between 1997 and 2005. ACSI data.

Sun (2012)	• Variance in online product ratings increases the demand if the average rating is low.	Amazon and Barnes and Noble data online reviews on 3828 books.
Luo, Raitherl, and Wiles (2013)	• Brand rating dispersion within the dimensions of brand rating decreases the stock returns and increases the idiosyncratic risk. • Brand rating dispersion decreases the positive impact of brand ratings on stock returns.	YouGov-BrandIndex daily brand ratings
Wang, Liu, and Fang (2015)	• User review variance can have positive, negative and even neutral effects on sales.	Mixed Method Study (1035 observations with Movies and Cameras) & (Experiment with 242 subjects)

Table 2 – Categories in the Dataset

Categories	
Beverages/ New Age/Sports/Water	Food/ Refrigerated Yogurt
Computers/ Hardware	Food/ Salty Snacks
Computers/ Software	Food/ Soy Drinks
Consumer Electronics	Footwear/ Athletic
Consumer Electronics	Health & Beauty/ Bar Soap
Cosmetics and Fragrances/ Color Cosmetics	Health & Beauty/ Hair Color
Cosmetics and Fragrances/ Eye Color	Health & Beauty/ Shampoo
Cosmetics and Fragrances/ Lip Color	Health & Beauty/ Toothpaste
Cosmetics and Fragrances/ Men's Fragrances	Household/ Cleaners
Cosmetics and Fragrances/ Women's Fragrances	Household/ Diapers
Credit Cards	Household/ Facial Tissue
Entertainment	Household/ Liquid Laundry Detergent
Fast Food	Household/ Powder Laundry Detergent
Financial Services	Household/ Toilet Tissue
Food/ Cereal Bars	Petrol/ Automotive Aftercare/Lube
Food/ Coffee	Petrol/ Oil Companies
Food/ Cookies	Pharma/ Over the Counter/ Allergy/Cold Medicine
Food/ Crackers	Pharma/ Over the Counter/ Stomach/Antacids
Food/ Frozen Dinners and Entrees	Pharmaceutical/ Over the Counter/ Analgesics
Food/ Frozen Pizza	Retail
Food/ Ice Cream	Retail/ Supermarkets
Food/ Luncheon Meats	Telecommunications
Food/ Meat Alternatives	Travel/ Airlines
Food/ Ready to Eat Cereal	Travel/ Car Rentals
Food/ Refrigerated Orange Juice	Travel/ Hotels

Table 3 – Descriptive Statistics and Correlation Matrix

	Mean	SD	1	2	3	4	5	6	7
1. Sales	20.93	2.50	1						
2. Purchase Intention	6.34	1.12	.09 *	1					
3. PQD	2.36	.29	-.02	-.60**	1				
4. Perceived Quality	6.87	.64	-.08*	.78**	-.53**	1			
5. Advertising Exp.	17.11	2	.51**	.16**	-.17**	.13**	1		
6. Brand Age	39.93	24.59	-.10*	.12**	-.16**	.14**	.03	1	
7. No of Ratings	944.23	1995.75	.11**	.06	-.08*	.01	.08**	.01	1

**p<0.01 *p<0.05

Table 4 – Results (3 SLS) Model 1

		Coef.	**Coef.**	**Coef.**
Sales(t)				
R-square .96	Sales (t-1)	.20***	.20***	.20***
Observation:551	PQD(t-1)	-.31**	.50	-
	Perceived Quality(t-1)	.45***	.73***	.48***
	Advertisement Exp. (t-1)	.16***	.15***	-.25*
	Age(t)	.00***	.00**	.00**
	No of ratings (t)	.00**	00**	.00**
	PQD(t-1) *Perceived Quality(t-1)		-.11	
	Advertisement Exp. (t-1) *PQD(t-1)			.17***
Perceived Quality(t)				
R-square .78	Perceived Quality(t-1)	.68***	1.31***	.70***
Observation:551	PQD(t-1)	-.22***	1.59**	-
	Advertisement Exp. (t-1)	.02***	.02**	-.13**
	Age(t)	-.00	-.00	-.00
	No of ratings (t)	-00	-.00	-.00
	PQD(t-1) *Perceived Quality(t-1)	.	-.25***.	
	Advertisement Exp. (t-1) *PQD(t-1)			.06**
PQD(t)				
R-square .89	Perceived Quality(t-1)	-.04***	-.08	-
Observation:551	PDQ(t-1)	.76***	1.14***	.75***
	Advertisement Expenditures (t-1)	-.00	-.00	-.00*
	Age(t)	-.00	-.00	-.00
	No of ratings (t)	-.00	-.00	-.00
	PQD(t-1) *Perceived Quality(t-1)		-.05*	
	Advertisement Exp. (t-1) *PQD(t-1)			.01*

*** p<.01 ** p<.05 *p<.1

Table 5 – Results (3 SLS) Model 2

		Coef.	Coef.	Coef.
Purchase Intention (t)				
R-square .93	Purchase Intention (t-1)	.58***	.58***	.58**
Observation: 730	PQD(t-1)	.23***	1.02*	-.12
	Perceived Quality(t-1)	.32***	.76***	.32**
	Advertisement Exp. (t-1)	.02***	.02***	.03
	Age(t)	-.00	-.00	-.00
	No of ratings (t)	.00	.00	.00
	PQD(t-1) *Perceived Quality(t-1)		-.18**	
	Advertisement Exp. (t-1) *PQD(t-			-.00
Perceived Quality(t)				
R-square .85	Perceived Quality(t-1)	.71***	1.05**	.71**
Observation: 730	PQD(t-1)	.16***	.80*	-.30
	Advertisement Exp. (t-1)	.02***	.02***	.00
	Age(t)	.00	.00	.00
	No of ratings (t)	-.00	-.00	-.00
	PQD(t-1) *Perceived Quality(t-1)	.	-.13**.	
	Advertisement Exp. (t-1) *PQD(t-			.00
PQD(t)				
R-square .89	Perceived Quality(t-1)	.04***	.00	-
Observation: 730	PDQ(t-1)	.77***	.89***	.72**
	Advertisement Exp. (t-1)	-.00	-.00	-.00
	Age(t)	-.00	-.00	-.00
	No of ratings (t)	-.00*	-.00*	-.00*
	PQD(t-1) *Perceived Quality(t-1)		-.01	
	Advertisement Exp. (t-1) *PQD(t-			.00

*** p<.01 ** p<.05 *p<.1

Table 6a - Results (2SLS) Model 1

		Coef.	Coef.	Coef.
Sales (t)				
R-square .96	Sales (t-1)	.20**	.20***	.20***
Observation:551	PQD(t-1)	-	.49	-
	Perceived Quality(t-1)	.44**	.73*	.48***
	Advertisement Exp. (t-1)	.16**	.15***	-.25*
	Age(t)	.00**	.00**	.00**
	No of ratings (t)		.00**	.00**
	PQD(t-1) *Perceived Quality(t-1)		-.11	
	Advertisement Exp. (t-1) *PQD(t-1)			.17***
Perceived Quality(t)				
R-square .78	Perceived Quality(t-1)	.68**	1.31***	.70***
Observation:551	PQD(t-1)	-	1.59**	-
	Advertisement Expenditures (t-1)	.02**	.02**	-.13**
	Age(t)	-.00	-.00	-.00
	No of ratings (t)	-.00	-.00	-.00
	PQD(t-1) *Perceived Quality(t-1)	.	-	
	Advertisement Exp. (t-1) *PQD(t-1)			.06**
PQD(t)				
R-square .89	Perceived Quality(t-1)	-	.08	-.04***
Observation:551	PDQ(t-1)	.76**	1.14***	.45**
	Advertisement Exp. (t-1)	-.00	-.00	-.04*
	Age(t)	-.00	-.00	-.00
	No of ratings (t)	-.00	-.00	-.00
	PQD(t-1) *Perceived Quality(t-1)		-.05*	
	Advertisement Exp. (t-1) *PQD(t-1)			.01*

*** p<.01 ** p<.05 *p<.1

Table 6b – Results (2SLS) Model 2

		Coef.	**Coef.**	**Coef.**
Purchase Intention (t)				
R-square .93	Purchase Intention (t-1)	.66***	.67***	.66***
Observation: 730	PQD(t-1)	-.19***	1.11*	-.14
	Perceived Quality(t-1)	.23***	.68***	.23***
	Advertisement Exp. (t-1)	.02***	.02**	.02
	Age(t)	-.00	-.00	-.00
	No of ratings (t)	.00	.00	.00
	PQD(t-1) *Perceived Quality(t-1)		-.18**	
	Advertisement Exp. (t-1) *PQD(t-1)			-.00
Perceived Quality(t)				
R-square .85	Perceived Quality(t-1)	.71***	1.05***	.71***
Observation: 730	PQD(t-1)	-.16***	.80	-.30
	Advertisement Exp. (t-1)	.02***	.02***	.00
	Age(t)	.00	.00	.00
	No of ratings (t)	-.00	-.00	-.00
	PQD(t-1) *Perceived Quality(t-1)	.	-.13*.	
	Advertisement Exp. (t-1) *PQD(t-1)			.00
PQD(t)				
R-square .90	Perceived Quality(t-1)	-.04***	.00	-
Observation: 730	PDQ(t-1)	.77***	.89***	.72***
	Advertisement Exp. (t-1)	-.00	-.00	-.00
	Age(t)	-.00	-.00	-.00
	No of ratings (t)	-.00	-.00*	-.00*
	PQD(t-1) *Perceived Quality(t-1)		-.01	
	Advertisement Exp. (t-1) *PQD(t-1)			.00

*** p<.01 ** p<.05 *p<.1

Table 7a - Results (SURE) Model 1

		Coef.	**Coef.**	**Coef.**
Sales (t)				
R-square .96	Sales (t-1)	.20***	.20***	.20***
Observation:551	PQD(t-1)	-.31**	.50	-
	Perceived Quality(t-1)	.45***	.73*	.48***
	Advertisement Exp. (t-1)	.16***	.15***	-.25**
	Age(t)	.00***	.00**	.00**
	No of ratings (t)	.00**	.00**	.00**
	PQD(t-1) *Perceived Quality(t-1)		-.11	
	Advertisement Exp. (t-1) *PQD(t-1)			.17***
Perceived Quality(t)				
R-square .78	Perceived Quality(t-1)	.68***	1.59***	.70***
Observation:551	PQD(t-1)	-.22***	1.31***	-
	Advertisement Exp. (t-1)	.02***	.02**	-.13**
	Age(t)	-.00	-.00	-.00
	No of ratings (t)	-.00	-.00	-.00
	PQD(t-1) *Perceived Quality(t-1)	.	-	
	Advertisement Exp. (t-1) *PQD(t-1)			.06**
PQD(t)				
R-square .89	Perceived Quality(t-1)	-.04***	.08	-.04***
Observation:551	PDQ(t-1)	.76***	1.14***	.45***
	Advertisement Exp. (t-1)	-.00	-.00	-.04*
	Age(t)	-.00	-.00	-.00
	No of ratings (t)	-.00	-.00	-.00
	PQD(t-1) *Perceived Quality(t-1)		-.05*	
	Advertisement Exp. (t-1) *PQD(t-1)			.01*

*** p<.01 ** p<.05 *p<.1

Table 7b – Results (SURE) Model 2

		Coef.	**Coef.**	**Coef.**
Purchase Intention (t)				
R-square .93	Purchase Intention (t-1)	.58***	.58***	.58**
Observation: 730	PQD(t-1)	-.23***	1.02*	-.12
	Perceived Quality(t-1)	.32***	.76***	.32**
	Advertisement Exp.(t-1)	.02***	.02***	.03
	Age(t)	-.00	-.00	-.00
	No of ratings (t)	.00	.00	.00
	PQD(t-1) *Perceived Quality(t-1)		-.18**	
	Advertisement Exp. (t-1) *PQD(t-1)			-.00
Perceived Quality(t)				
R-square .85	Perceived Quality(t-1)	.71***	1.05**	.71**
Observation: 730	PQD(t-1)	-.16***	.80*	-.30
	Advertisement Exp. (t-1)	.02***	.02***	.02
	Age(t)	.00	.00	.00
	No of ratings (t)	-.00	-.00	-.00
	PQD(t-1) *Perceived Quality(t-1)	.	-.13**.	
	Advertisement Exp. (t-1) *PQD(t-1)			.00
PQD(t)				
R-square .90	Perceived Quality(t-1)	-.04***	.00	-
Observation: 730	PDQ(t-1)	.77***	.89***	.72**
	Advertisement Exp. (t-1)	-.00	-.00	-.00
	Age(t)	-.00	-.00	-.00
	No of ratings (t)	-.00*	-.00*	-.00*
	PQD(t-1) *Perceived Quality(t-1)		-.01	
	Advertisement Exp. (t-1) *PQD(t-1)			.00

*** p<.01 ** p<.05

Table 8a – Results (OLS) Model 1

		Coef.	**Coef.**	**Coef.**
Sales(t)				
R-square .96	Sales (t-1)	.20***	.20***	.20***
Observation:551	PQD(t-1)	-.31**	.49	-3.32***
	Perceived Quality(t-1)	.45***	.73*	.48***
	Advertisement Exp. (t-1)	.16***	.15***	-.25*
	Age(t)	.00**	.00**	.00**
	No of ratings (t)	.00**	.00**	.00**
	PQD(t-1) *Perceived Quality(t-1)		-.11	
	Advertisement Exp. (t-1) *PQD(t-1)			.17***
Perceived Quality(t)				
R-square .78	Perceived Quality(t-1)	.68***	1.31***	.70***
Observation:551	PQD(t-1)	-.22***	1.59**	-1.38***
	Advertisement Exp. (t-1)	.02**	.02**	.13**
	Age(t)	-.00	-.00	-.00
	No of ratings (t)	-.00	-.00	-.00
	PQD(t-1) *Perceived Quality(t-1)	.	-.25***.	
	Advertisement Exp. (t-1) *PQD(t-1)			.06**
PDQ(t)				
R-square .89	Perceived Quality(t-1)	-.04***	.08	-.04***
Observation:551	PDQ(t-1)	.76***	1.14***	.45**
	Advertisement Expenditures (t-1)	-.00	-.00	-.04*
	Age(t)	-.00	-.00	-.00
	No of ratings (t)	-.00	-.00	-.00
	PQD(t-1) *Perceived Quality(t-1)		-.05*	
	Advertisement Exp. (t-1) *PQD(t-1)			.01*

*** p<.01 ** p<.05

Table 8b – Results (OLS) Model 2

		Coef.	**Coef.**	**Coef.**
Purchase Intention (t)				
R-square .93	Purchase Intention (t-1)	.66***	.67***	.66***
Observation: 730	PQD(t-1)	-.19***	1.11*	-.14
	Perceived Quality(t-1)	.23***	.68***	.23***
	Advertisement Exp. (t-1)	.02**	.02**	.02
	Age(t)	-.00	-.00	-.00
	No of ratings (t)	.00	.00	.00
	PQD(t-1) *Perceived Quality(t-1)		-.18**	
	Advertisement Exp. (t-1) *PQD(t-1)			-.00
Perceived Quality(t)				
R-square .85	Perceived Quality(t-1)	.71***	1.05***	.71***
Observation: 730	PQD(t-1)	-.16***	.80	-.30
	Advertisement Exp. (t-1)	.02***	.02***	.00
	Age(t)	.00	.00	.00
	No of ratings (t)	-.00	-.00	-.00
	PQD(t-1) *Perceived Quality(t-1)	.	-.13*.	
	Advertisement Exp. (t-1) *PQD(t-1)			.00
PQD(t)				
R-square .90	Perceived Quality(t-1)	-.04***	.00	-
Observation: 730	PDQ(t-1)	.77***	.89***	.72***
	Advertisement Exp. (t-1)	-.00	-.00	-.00
	Age(t)	-.00	-.00	-.00
	No of ratings (t)	-.00*	-.00*	-.00*
	PQD(t-1) *Perceived Quality(t-1)		-.01	
	Advertisement Exp. (t-1) *PQD(t-1)			.00

*** p<.01 ** p<.05 *p<0.1

Table 9 – Summary of Findings

	Hypothesis	Findings
H_1	There is a negative relationship between PQD and perceived quality.	✓
H_2	There is a negative relationship between advertising expenditures and PQD.	**n.s.**.
H_3	There is a negative relationship between brand age and PQD?	**n.s.**
H_{4a}	There is a negative relationship between PQD and sales.	✓
H_{4b}	There is a negative relationship between PQD and purchase intention.	✓
H_{5a}	Perceived quality negatively moderates the relationship between PQD and sales.	**n.s.**
H_{5b}	Perceived quality negatively moderates the relationship between PQD and purchase intention.	✓
H_{6a}	PQD positively moderates the relationship between advertising and sales.	✓
H_{6b}	PQD positively moderates the relationship between advertising and purchase intention.	**n.s.**

Notes: ✓ = supported **n.s.** = not supported

Table 10 – Hedonic and Utilitarian Scores of the Categories

Product Categories	**Utilitarian Score**	**Hedonic Score**
Airline	5.67	1.46
Apparel	5.84	5.28
Car Rental	5.45	3.75
Cereal Products	4.66	3.95
Hotels	5.89	5.27
Non-Alcoholic Beverages	5.28	4.37
Shampoos	5.84	3.49
Small Appliances	5.87	3.67
Automobiles	6.47	5.68
Bar Soaps	5.23	3.23
Cereal Bars	4.47	3.93
Coffee	3.92	3.65
Consumer Electronics	5.55	5.25
Cookies	3.71	5.15
Credit Cards	5.70	4.24
Diapers	5.85	2.20
Energy Drinks	4.46	3.85
Facial Tissues	5.43	2.85
Fast Food	3.53	4.12
Financial Services	5.64	3.45
Footwear	5.86	4.37
Fragrances	4.81	4.46
Frozen Food	5.09	3.41
Hardware	5.93	3.28
Ice cream	4.62	5.87
Laundry Detergent	6.06	2.74
Liquor	3.59	4.21
Meat Alternatives	4.33	2.99
Meat Products	5.30	4.73
Movies	4.35	5.78
Oil Companies	4.98	2.45
Orange Juice	4.53	4.28
Pharma	5.18	2.95
Salty Snacks	3.85	4.46
Software	5.78	4.77
Soy Drinks	4.21	3.11
Supermarket	5.98	3.72
Telecom	5.87	4.20
Tobacco	2.00	2.26

Toilette Tissues	6.23	2.77
Toothpaste	6.24	3.10
Toys	4.60	5.82
Trucks	5.63	3.65
Web Services	6.45	6.13
Yoghurt	4.60	4.09
Cronbach Alpha	**0.93**	**0.94**

Table 11 – General Model Estimates

Variables		Coefficient	
Intercept		9.78	*
PQ(t-1)	γ_1	.16	*
PQD	γ_2	-.97	*
PQD(t-1)	γ_3	-.53	*
No of Ratings(t)		.00	*
Observation[a]		7900	
R-square		.69	
Contemporaneous Effect		-.97	
Short-term Carryover		-.53	
Short-term Effect		-1.50	
Long-term Effect		-1.80	
Carryover duration		1.84 years	

*p<.01

a Brands that have at least 5 years of observation were used in the analysis.

Table 12 – Model Estimates for Service Brands and Product Brands

		Service Brands		**Product Brands**	
Variables		Coefficient		Coefficient	
Intercept		9.83	*	9.66	*
PQ(t-1)	γ_1	.14	*	0.17	*
PQD	γ_2	-.98	*	-0.95	*
PQD(t-1)	γ_3	-.52	*	-0.53	*
No of Ratings(t)		.00	*	.00	*
Observation[a]		3,604		4,283	
R- square		.60		.75	
Contemporaneous Effect		-.98		-.94	
Short-term Carryover		-.52		-.53	
Short-term Effect		-1.51		-1.48	
Long-term Effect		-1.77		-1.79	
Carryover duration		1.78 Years		1.89 Years	

* p<.01

a Brands that have at least 5 years of observation were used in the analysis.

Table 13 – Model Estimates for Service Brands and Product Brands

Variables		**Service Brands** Coefficient		**Product Brands** Coefficient	
Intercept		9.01	**	7.97	**
PQ(t-1)	γ_1	.22	**	0.31	**
PQD	γ_2	-.99	**	-.76	**
PQD(t-1)	γ_3	-.37	**	-.43	**
No of Ratings(t)		.00	**	.00	*
Observation[a]		1784		1839	
R- square		.63		.86	
Contemporaneous Effect		-.99		-.76	
Short-term Carryover		-.37		-.43	
Short-term Effect		-1.37		-1.19	
Long-term Effect		-1.76		-1.75	
Carryover duration		1.98 Years		2.51 Years	

** p<.01 *p<.05

a Brands that have at least 10 years of observation were used in the analysis.

Table 14 – Model Estimates for Utilitarian Goods and Hedonic Goods

		Utilitarian Goods		**Hedonic Goods**	
Variables		Coefficient		Coefficient	
Intercept		11.53	*	12.22	*
PQ(t-1)	γ_1	-.08		-.07	
PQD	γ_2	-.66	*	-0.94	*
PQD(t-1)	γ_3	-.82	*	-0.74	*
No of Ratings(t)		.00	*		
Observations[a]		556		389	
R-square		0.49		0.70	
Contemporaneous Effect		-.66		-.94	
Short-term Carryover		-.82		-.74	
Short-term Effect		-1.49		-1.68	
Long-term Effect		NA		NA	
Carryover duration		NA		NA	

* $p<.01$

a Brands that have at least 5 years of observation were used in the analysis.

Table 15 – Summary of Findings

	Hypothesis	Findings
H_{1a}	There is a negative contemporaneous effect of PQD on perceived quality.	✓
H_{1b}	There is a short-term carryover effect of PQD on perceived quality.	✓
H_{2a}	There is a negative long-term effect of PQD on perceived quality.	✓
H_{2b}	There is a negative long-term carryover effect of PQD on perceived quality	✓
H_{3a}	The contemporaneous effect of PQD on perceived quality is higher for the services.	✓
H_{3b}	The short-term effect of PQD on perceived quality is higher for the services.	✓
H_{3c}	The long-term effect of PQD on perceived quality is higher for the services.	**n.s**
H_{4a}	The contemporaneous effect of PQD on perceived quality is higher for the utilitarian goods.	**n.s**
H_{4b}	The short-term effect of PQD on perceived quality is higher for the utilitarian goods.	**n.s**
H_{4c}	The long-term effect of PQD on perceived quality is higher for the utilitarian goods.	**n.s.**

Notes: ✓ = supported **n.s.** = not supported

Figure 1 - Perceived Quality, PQD, Purchase Intention, Sales and Their 1-Year Lags

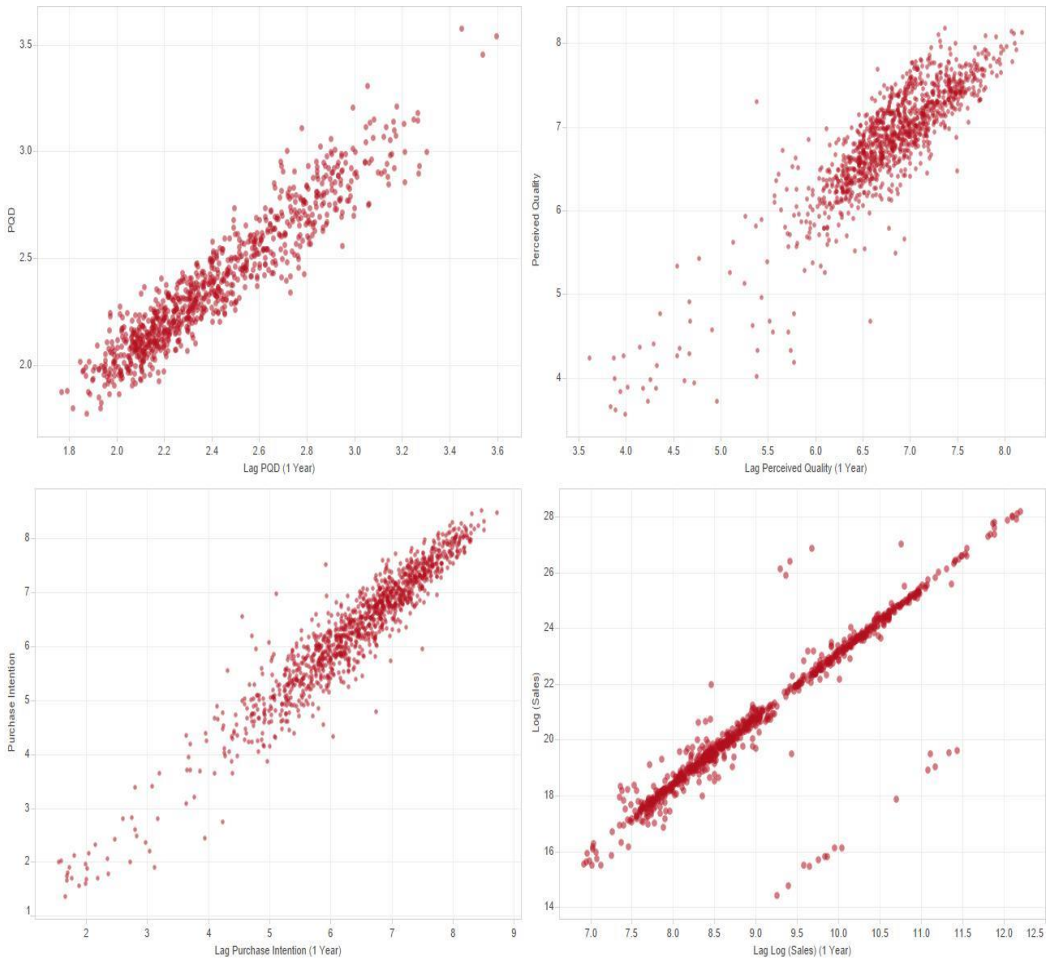


Figure 2 - Moderating Effect of Perceived Quality on the PQD-Sales Relationship

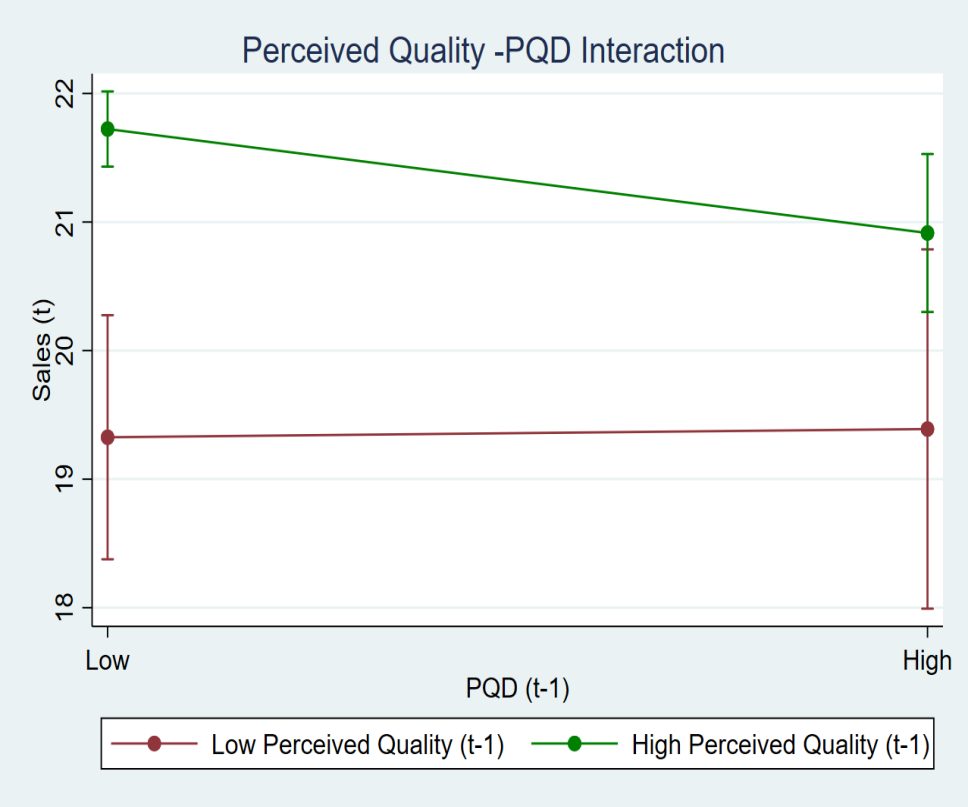
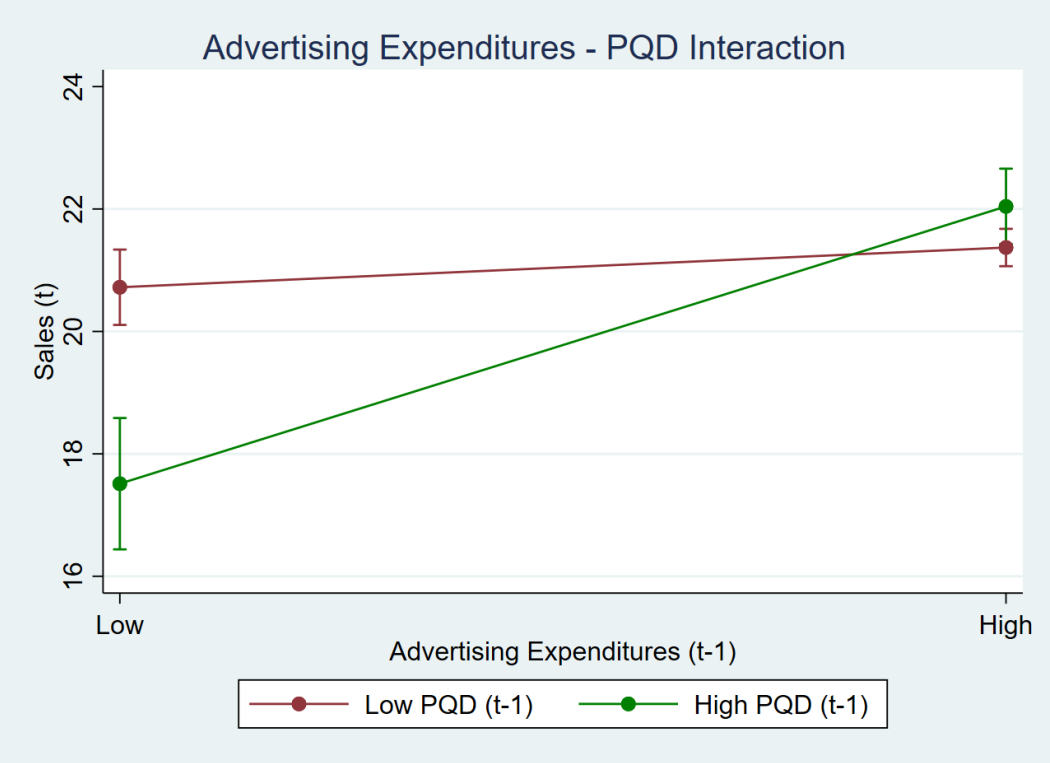


Figure 3 - Moderating Effect of the PQD on the Advertising Expenditures-Sales

Relationship



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