Credence Goods and Online Product Reviews: An Exploration of the Product Type Concept in the Social Commerce Era

Completed Research Paper

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ABSTRACT

Social commerce has shown significant growth in recent years. Today, consumers share their opinions and experiences about a wide range of services and products online in order to reduce their information search costs. In the related literature building upon the product type concept, the traditional distinction between search goods and experience goods seems to be taken for granted. However, credence goods, i.e. products for which qualities cannot be easily evaluated even after purchase, have not been taken into account yet although online product reviews are especially important in this context. Thus, we present an empirical analysis of product reviews collected from amazon.com to extend the knowledge about the product type concept and conduct a content analysis of reviews discussing credence goods. We find that these differ regarding product evaluations, statements about product quality and expressed feelings of need. Implications are drawn for both theory and practice.

Keywords

Social commerce, product type, online product reviews, credence goods, content analysis.

INTRODUCTION

The shift from traditional offline commerce to e-commerce as well as the emergence of web 2.0 and social media has eased customer interactions and knowledge sharing related to the products offered or purchased (Curty and Zhang, 2011). Thus, consumers use tools like blogs, social networks or recommendation systems to share their experiences. In this context, online product reviews are one important possibility for customers to communicate their opinions. Previous research has already highlighted the importance of such word-of mouth communication. It has been shown that online product reviews have an impact on sales (Chevalier and Mayzlin, 2006; Forman, Ghose and Wiesenfeld, 2008; Zhu and Zhang, 2010) and an increasing amount of studies has investigated which factors make consumers to perceive online product reviews as helpful (Ghose and Ipeirotis, 2011; Mudambi and Schuff, 2010).

In these studies, two product types have been distinguished to investigate the differences among product reviews: search goods and experience goods (Nelson, 1970). Search goods represent goods whose quality can be assessed easily before purchase. In contrast, experience goods require purchase to evaluate product quality (Mudambi and Schuff, 2010). Since the original classification scheme of search and experience goods has been published in the 1970s (Nelson, 1970), both new service and product developments as well as social commerce have had a significant impact on product-related information search costs and the differences between both product types are blurred (Huang, Lurie and Mitra, 2009). Furthermore, in business research, another important product category has been introduced: credence goods, i.e. products whose quality cannot be evaluated even after purchase and normal usage (Darby and Karni, 1973). Thus, the evaluation of credence goods becomes more costly for consumers since it requires further information (Darby and Karni, 1973).

Empirical research has provided evidence that such product-related uncertainty can have a significant impact on product prices (Dimoka, Hong and Pavlou, 2012). Consequently, corporations have to be especially aware of products with credence qualities and adapt their marketing strategies (Bloom and Pailin, 1995; Moorthi, 2002). Although the challenge of identifying and addressing product types has recently been taken into account for the search/experience good dichotomy on the basis of quantitative (i.e. star ratings) product review data (Hong, Chen and Hitt, 2012), to the best of our knowledge, there is a lack of research on products with such uncertain properties (i.e. credence goods).

Against this background, we aim at closing this research gap by exploring the unstructured (i.e. textual) aspects of online product reviews. With a special focus on credence goods, our research contributes to the understanding of whether or not a given product or service has credence qualities, and thus needs to be handled appropriately. Consequently, we explore

whether product reviews related to credence goods differ from reviews related to search and experience goods. We acquire a dataset of 20,135 amazon.com product reviews related to the three product types. Based on content analysis, we investigate whether and how statements related to product judgment and evaluation, quality as well as expression of need differ among search, experience and credence goods.

Our results provide new theoretical insights on the product type concept related to credence goods as well as practical implications on whether online retailers as well as customers should consider product type differences within their product descriptions, review systems and advertising campaigns. This study also provides insights on how to assess potential credence qualities of products and services which cannot be easily identified as credence goods (such as financial products). From a methodological perspective, we hereby extend the existing literature by illustrating how to utilize unstructured (i.e. textual) micro level data (product review text) by applying content analysis in order to explore the product type concept.

The remainder of this paper is structured as follows. In section 2, we give an overview of the background of our study and derive our research hypotheses. In section 3, we present the research methodology applied, including dataset acquisition, content analysis and logit regression. The results of our empirical study are presented and discussed in section 4. Finally, section 5 concludes.

BACKGROUND AND RESEARCH HYPOTHESES

Social Commerce and Online Product Reviews

Social commerce is distinguished from traditional commerce by the fact that consumers participate during the commerce process and communicate through a collaborative online environment (Curty and Zhang, 2011). Thus, instead of being isolated, consumers are enabled to communicate, share product-related information and get advice from other consumers (Ickler, Schülke, Wilfling and Baumöl, 2009). For that purpose, consumers are allowed to tag products, create wish lists or to comment on products. As a result, consumers profit from social commerce since they can decrease search costs and make better informed decisions. Furthermore, online retailers can profit from social commerce as well through attracting an increased number of consumers with user-generated product recommendations (Curty and Zhang, 2011).

As a result, next to product discussions in social networks, especially product-related user-generated content on online shopping websites plays an important role within social commerce (Curty and Zhang, 2011; Ickler et al., 2009). Consequently, previous research has investigated the impact of those online product reviews and has found a relation to product sales (Chevalier and Mayzlin, 2006; Forman et al., 2008; Zhu and Zhang, 2010). Furthermore, recent studies analyze which online product reviews are perceived by consumers to be helpful. Here, review diagnosticity theory explains which factors are important during the purchase decision-making process and thus increase a review's helpfulness (Mudambi and Schuff, 2010).

The Role of Credence Goods in Social Commerce

Although previous studies in the context of online product reviews recognize the importance of distinguishing between different product types (Mudambi and Schuff, 2010), they only consider search and experience goods. Mainly distinguished by the fact that product quality can be assessed before (search goods) or after purchase (experience goods), for instance, these product categories cover computer printers (search good) or music (experience good) (Nelson, 1970). However, the quality of several products can neither be assessed in advance or after purchase and normal usage (Darby and Karni, 1973). Examples for such credence goods or services are products claiming higher safety like home security systems (Balineau and Dufeu, 2010), medical services aiming at extending the lifespan (Bloom and Pailin, 1995), spiritualist products like palm reading (Ekelund, Mixon and Ressler, 1995) or even financial services (Ekelund et al., 1995).

As a consequence, the qualities of these goods are expensive to judge even after purchase (Darby and Karni, 1973). Thus, consumers of credence goods are faced with increased uncertainty related to the product, which increases the importance to obtain product-related information (Balineau and Dufeu, 2010). For instance, such information may be given through labeling by trusted authorities (Roe and Sheldon, 2007) or through recommendations by other consumers, e.g. in form of online product reviews (Alford and Sherrell, 1996).

Although online product reviews related to credence goods are especially important for consumers' purchase decisions, this product type has not been taken into account within previous research yet. An appropriate understanding of the information provided within online product reviews about credence goods would be beneficial both for online consumers and online retailers: on the one hand, online consumers can understand what factors are important within the context of evaluating credence goods, which they might also take into account when recommending goods to other consumers. On the other hand, for online retailers or product manufacturers, an appropriate understanding of what information is important within this context can help to align product descriptions or marketing strategies.

Research Hypotheses

Based on the characteristics of credence goods, it can be assumed that online product reviews related to this product type differ from other product types in several dimensions, i.e. statements about product judgment and evaluation, statements about product quality and expressions of need.

In case of search goods, a product can be evaluated already before purchase. Additionally, experience goods can be evaluated after purchase (Nelson, 1970), so online consumers publishing product reviews related to both product types can also provide excessive discussions about the product. In contrast, credence goods are more difficult to evaluate (Alford and Sherrell, 1996) which also causes us to assume that related online product reviews contain less statements referring to product judgment and evaluation than in the case of search and experience goods. Thus, we hypothesize: *Compared to search and experience goods, online product reviews about credence goods contain less statements referring to product judgment and evaluation (H1).*

Because of these specific characteristics of credence goods, a discussion of product quality is very hard even after purchase and normal usage of the product (Alford and Sherrell, 1996). As a consequence, consumers publishing an online product review are also confronted with the difficulty to assess and consequently, to discuss aspects related to product quality. Against this background, we hypothesize: *Compared to search and experience goods, online product reviews about credence goods contain less statements about product quality (H2).*

Since obtaining information about the product quality of credence goods is especially costly for consumers (Balineau and Dufeu, 2010), products of this type are connected with the prerequisite that customers purchasing such a product believe that it is of value. Consequently, it can be assumed that consumers discussing credence goods in online product reviews rather focus on intangible aspects. Thereby, we assume them to focus on feelings of need related to the product and hypothesize: *Compared to search and experience goods, online product reviews about credence goods contain more expressions of need (H3).*

RESEARCH METHODOLOGY

Dataset Acquisition

To be able to test the research hypotheses empirically, we acquire a dataset of amazon.com online product reviews related to the different types of search, experience and credence goods. In case of search and experience goods, we follow Mudambi and Schuff (2010) and include product reviews related to products of the categories "Camera & Photo", "Computer Printers" as well as "Cordless Telephones" (search goods) and "MP3 Players", "Music" as well as "PC-compatible Games" (experience goods). Therefore, we download the product reviews related to the 20 best selling products for each category and consequently assume to cover an adequate amount of reviews.

For credence goods, we decide to download product reviews related to the best selling products of the category "Stress Reduction Products". The products listed in this category adequately and obviously represent products fitting the credence good definition: This category contains medical and spiritualist products whose quality cannot be assessed objectively before and even after purchase, i.e. stress reduction pills or healing stones. As a consequence, we assume the variety of credence goods as adequately covered. To obtain online product reviews related to a number of products that is comparable to search and experience goods, we crawl the top 100 best selling products for this category. In general, we only take into account those product reviews that received at least one review helpfulness voting in order to be able to use the percentage of review helpfulness as control variable.

Variable Operationalization

We operationalize the different variables by means of content analysis. These are thus extracted directly from the product reviews. Content analysis denotes the process of "making inferences from a symbolic medium, usually texts" by classifying "textual material, reducing it to more relevant, manageable bits of data" (Weber, 1983) and should conducted as objective as possible (Stone and Hunt, 1963).

Different ways to perform content analysis have been chosen within related studies (Rosenberg, Schnurr and Oxman, 1990): On the one hand, documents are coded manually. On the other hand, automated approaches for content analysis have been developed. In comparison to manual coding, no problems with inter-coder reliability prevail if automated content analysis is applied on the basis of dictionaries, which can be repeated easily without any loss in quality (Weber, 1983). Additionally, automated content analysis has been shown to be reliable (Rosenberg et al., 1990; Schnurr, Rosenberg, Oxman and Tucker, 1986) and, in comparison to manual coding, less time consuming (Rosenberg et al., 1990). Finally, the underlying dictionaries are oftentimes publicly available, so automated coding of documents is accompanied by high transparency and the results can be reproduced easily (Weber, 1984).

In the course of automated content analysis, dictionaries are applied to map different words of a text to several pre-defined categories that represent psychological concepts. As a next step, the frequencies of how often a certain category is contained within a text can be used for further analyses (Weber, 1983). Several dictionaries have been developed and evaluated to provide measurements for psychological constructs. In our study, we make use of the well-established dictionary of the General Inquirer (GI) (Stone, Bales, Namenwirth and Ogilvie, 1962; Stone and Hunt, 1963). The GI is a text analysis framework that has already been applied in a number of studies in different fields (Stone and Hunt, 1963).

We operationalize *eval* as the ratio of the number of words referring to the GI category *judgment and evaluation* to the number of total words (exemplary terms in this category are "comfortable" or "good"). Likewise, *quality* refers to terms indicating qualities (e.g. "secure", "stable" or "weak") and *need* refers to expressions of need or intent (e.g. "addict" or "curious").

Logit Analysis

Next to considering the descriptive statistics of the different product categories, we also perform a logit regression analysis to investigate what attributes constitute product reviews related to credence goods (Stock and Watson, 2011). Therefore, we model the probability of a product review to be related to a credence good as a function of the different review characteristics (see equation 1). For that purpose, logit regression is appropriate since it is especially suitable for analysis with a binary dependent variable (Stock and Watson, 2011). For each review, we further include as control variables the number of words a review consists of (*no_of_words*), the number of stars (*stars*), the helpfulness voting in percent (*helpful_percent*) and the number of consumers having evaluated the review as helpful or not helpful (*no_total*). Please note that we have also rerun our analysis with a probit model and a linear model and that the results of our study remained robust in these cases.

$$\Pr(Credence = 1) = F(constant + \beta_1 eval + \beta_2 quality + \beta_3 need + \beta_4 no\_of\_words + \beta_5 stars$$
$$+ \beta_6 helpful\_percent + \beta_7 no\_total + \varepsilon)$$

$$where \ F(\beta'X) = e^{\beta'X}/(1 + e^{\beta'X})$$

(1)

EMPIRICAL STUDY

Descriptive Statistics

Table 1 provides the descriptive results of our sample. In total, our dataset consists of 20,135 online product reviews, whereas 6,643 are dealing with search goods, 12,302 with experience goods and 1,190 with credence goods. At first, it can be observed that reviews related to credence goods are on average perceived to be more helpful than reviews related to the other product types. Furthermore, the average star rating of such reviews is comparable to experience goods and more positive than in the case of search goods. Related to the research hypotheses, we find first evidence that reviews related to credence goods contain fewer evaluations when compared to the other product categories since *eval* is much lower than in the case of search and experience goods. Furthermore, the amount of statements related to product quality (*quality*) is also lower than in the case of search goods and, to some extent, experience goods. Finally, reviews related to credence goods contain more statements related to feelings of need (*need*). Thus, these results provide first evidence for our research hypotheses.

Variable	Full Sample Mean (SD)	Search Goods Mean (SD)	Experience Goods Mean (SD)	Credence Goods Mean (SD)
eval	0.039 (0.038)	0.047 (0.043)	0.035 (0.034)	0.031 (0.029)
quality	0.022 (0.024)	0.028 (0.027)	0.019 (0.022)	0.018 (0.020)
need	0.014 (0.014)	0.014 (0.014)	0.013 (0.014)	0.020 (0.020)
no_of_words	166.480 (215.907)	173.943 (209.815)	168.190 (225.725)	107.150 (111.614)
stars	3.610 (1.615)	3.985 (1.387)	3.378 (1.697)	3.905 (1.479)
helpful_percent	0.649 (0.366)	0.752 (0.339)	0.581 (0.369)	0.772 (0.314)
no_total	12.636 (71.674)	12.295 (66.540)	13.344 (77.489)	7.220 (10.106)
n	20,135	6,643	12,302	1,190

Table 1. Means and Standard Deviations (SD)

Table 2 presents the correlations of the different variables, which are in general low. Thus, these variables can be used within the regressions without the risk of multicollinearity. Furthermore, these results provide evidence that the different categories

of the General Inquirer used in this study are almost independent, i.e. terms contained in one word list are only rarely contained in another word list.

	Variable	1	2	3	4	5	6	7
1	eval	1						
2	quality	0.353	1					
3	need	-0.082	-0.061	1				
4	no_of_words	-0.171	-0.051	0.007	1			
5	stars	0.212	0.100	0.008	-0.016	1		
6	helpful_percent	0.038	0.071	0.023	0.145	0.167	1	
7	no_total	-0.035	-0.018	-0.007	0.196	-0.049	0.028	1

Table 2. Variable Correlations

Logit Analysis

Table 3 shows the results of the logit analysis, whereas the regressions are run for the full sample (1), for search and credence goods (2) and for experience and credence goods (3). Related to H1, we find that the amount of words related to judgment and evaluation has a negative influence on the probability of a review to be related to a credence good, i.e. the lower *eval*, the higher the probability that a review is about a credence good. This relationship is significant at the 1% level and thus, H1 can be accepted.

		(1) Full Sample		(2) Search Goods and Credence Goods		(3) Experience Goods and Credence Goods	
		Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
constant		-3.400	0.000***	-0.903	0.000***	-3.685	0.000***
H1:	eval	-12.202	0.000***	-16.669	0.000***	-9.051	0.000***
H2:	quality	-5.812	0.001***	-16.489	0.000***	0.898	0.554
H3:	need	21.553	0.000***	21.321	0.000***	22.435	0.000***
	no_of_words	-0.004	0.000***	-0.005	0.000***	-0.004	0.000***
	stars	0.114	0.000***	-0.003	0.903	0.169	0.000***
	helpful_percent	1.347	0.000***	0.675	0.000***	1.698	0.000***
	no_total	-0.002	0.025**	-0.001	0.179	-0.002	0.045**
$p > \chi^2$			0.000***		0.000***		0.000***
Pseudo R^2		0.083		0.114		0.104	
no. of observations		20,135		7,833		13,492	

Table 3. Logit Regression Results (Robust Standard Errors) * / ** / * Indicate Significance at the 10% / 5% / 1% Level**

If H2 is taken into account, we find that an increased number of statements related to product quality decreases the probability of a product review to be related to a credence good. This is significant at the 1% level if the full sample or if search goods are taken into account. In case of experience goods, this relationship is not significant. As a consequence, online consumers writing product reviews related to credence goods do not discuss product quality aspects as in the case of search goods. Related to H3, we find that online product reviews about credence goods contain an increased amount of statements expressing feelings of need. This relationship is significant at the 1% level of significance in all regressions. As a consequence, H3 can be accepted as well.

For the control variables, we confirm that online reviews about credence goods have a lower review depth, i.e. they consist of a reduced amount of words. Furthermore, we find that these reviews are perceived to be more helpful than reviews in the case

of search and experience goods. Credence goods receive higher star ratings than experience goods and in comparison to experience goods, a reduced amount of consumers evaluates the reviews as helpful or not helpful.

Considering the quality of our results, we find that the null hypothesis that none of the independent variables has an influence on the dependent variable ($p > \chi^2$) can be rejected at the 1% level of significance in all cases. Since in case of a binary dependent variable, R^2 is not appropriate to measure the goodness of fit of the model (Stock and Watson, 2011), we take the Pseudo R^2 as calculated by Stata 10.0 into account which can be used to compare the performance of different models. Here, we find that the results for (2) and (3) outperform the results of (1). Finally, in order to test for multicollinearity, we estimate the model using ordinary least squares and compute variance inflation factors. Thereby, no multicollinearity was detected since the highest score of 1.23 is below common thresholds of 4 and 10 (O'Brien, 2007).

Discussion

Within our empirical study, we observe that online product reviews about credence goods differ from online product reviews dealing with search or experience goods. These differences can be explained by the specific characteristics of credence goods, i.e. with the fact that it is hard to evaluate the product even after purchase and normal usage. Since the online product reviews analyzed contain less information about product specific judgments, evaluations and quality, the consumers' perceived product uncertainty might have an effect on their purchase decisions. Consequently, online retailers should especially take care of providing additional information about the product in order to reduce consumers' uncertainty, probably by certifying products through trusted third parties.

The proposed methodology can also be applied in the important context of product type classification. Since the reduced information search costs and changed product characteristics have caused that the differences between product types are blurred (Huang et al., 2009), it is of high importance for online retailers to know which characteristics a product has and of which product type a good is in order to align marketing strategies. Thus, we show that a content analysis of unstructured product review data can improve the understanding of the product type concept.

The current study focuses on products that can be clearly assigned to the different product types. However, for products which might have characteristics of multiple product types, the results of our analysis might differ. Nevertheless, the proposed analysis can still be applied to investigate how certain it is that a product can be seen as a credence good. Furthermore, we are aware of the fact that also fraudulent online product reviews are published, which try to shed a certain positive or negative light on a product. However, we assume that the products covered within this study have a sufficient amount of related product reviews so that the risk that fraudulent online product reviews influence our results can be neglected.

CONCLUSION

The advent of social media has fostered the opportunity for consumers to share their opinions and experiences related to the products purchased. Since such user-generated content plays an important role within the social commerce context, previous studies have already investigated the aspects of online product reviews related to search and experience goods. However, the category of credence goods has not been investigated yet and an appropriate understanding of what constitutes related online product reviews is missing. Nevertheless, credence goods are important since consumers have to especially rely on other consumers' opinions since they are not able to judge a product's quality even after regular usage.

Consequently, we contribute to the social commerce literature focusing on online product reviews. Thereby, we extend the existing knowledge base by investigating the specific characteristics of online product reviews dealing with credence goods. We find that compared to search and experience goods, reviews about credence goods contain less statements of judgment and evaluation as well as product quality. Furthermore, we find an increased amount of statements expressing feelings of need. We also contribute to the discussion of the product type concept in general: our results as well as the proposed methodology focusing on unstructured micro-level data can be used to evaluate whether a certain product has credence good characteristics, which is especially important in case of products that do not exactly fit into the different categories.

From a practical viewpoint, our study is of high relevance for both online retailers and online consumers. On the one hand, online retailers are provided with an understanding of what aspects are typically (not) discussed within online product reviews and on which they have to give further information. As a consequence, online retailers might add further statements on product quality of credence goods (for instance information by certification authorities) since these aspects are hard to discuss within the reviews. Furthermore, since related reviews contain an increased amount of statements expressing feelings of need, online retailers might also adjust their advertising campaigns in order to take these feelings into account. On the other hand, consumers are provided with an understanding of which product related aspects should be discussed within their online product reviews.

Within future research, we plan to extend our analysis in multiple directions. At first, focusing on product reviews posted on amazon.com does not permit to analyze reviews of intangible services with credence good characteristics such as financial services. Therefore, we will analyze whether user-generated content posted on financial websites like seekingalpha.com also has these specific characteristics. Furthermore, the fact that online product reviews related to credence goods differ from search and experience goods leads to the assumption that also the perceived helpfulness of each review category differs, which is of high relevance for online retailers who want to assess a review's helpfulness. Thus, we plan to address this in subsequent work. Finally, we plan to investigate whether the product reviews differ concerning their authors' cultural background. Therefore, we plan to investigate online product reviews published in different countries.

REFERENCES

1. Alford, B. L. and Sherrell, D. L. (1996) The role of affect in consumer satisfaction judgments of credence-based services, *Journal of Business Research*, 37, 1, 71–84.

2. Balineau, G. and Dufeu, I. (2010) Are Fair Trade Goods Credence Goods? A New Proposal, with French Illustrations, *Journal of Business Ethics*, 92, 2, 331-345.

3. Bloom, P. N. and Pailin, J. E. (1995) Using information situations to guide marketing strategy, *Journal of Consumer Marketing*, 12, 2, 19–27.

4. Chevalier, J. A. and Mayzlin, D. (2006) The Effect of Word of Mouth on Sales: Online Book Reviews, *Journal of Marketing Research*, 43, 3, 345–354.

5. Curty, R. G. and Zhang, P. (2011) Social commerce: Looking back and forward, *Proceedings of the American Society for Information Science and Technology*, 48, 1, 1–10.

6. Darby, M. R. and Karni, E. (1973) Free Competition and the Optimal Amount of Fraud, *Journal of Law and Economics*, 16, 1, 67–88.

7. Dimoka, A., Hong, Y. and Pavlou, P. A. (2012) On Product Uncertainty in Online Markets: Theory and Evidence, *MIS Quarterly*, 36, 2, 395–426.

8. Ekelund, R. B., Mixon, F. G. and Ressler, R. W. (1995) Advertising and information: an empirical study of search, experience and credence goods, *Journal of Economic Studies*, 22, 2, 33–43.

9. Forman, C., Ghose, A. and Wiesenfeld, B. (2008) Examining the Relationship Between Reviews and Sales: The Role of Reviewer Identity Disclosure in Electronic Markets, *Information Systems Research*, 19, 3, 291–313.

10. Ghose, A. and Ipeirotis, P. G. (2011) Estimating the Helpfulness and Economic Impact of Product Reviews: Mining Text and Reviewer Characteristics, *IEEE Transactions on Knowledge and Data Engineering*, 23, 10, 1498–1512.

11. Hong, Y., Chen, P.-Y. and Hitt, L. M. (2012) Measuring Product Type With Dynamics of Online Product Review Variance, *ICIS 2012 Proceedings*.

12. Huang, P., Lurie, N. H. and Mitra, S. (2009) Searching for Experience on the Web: An Empirical Examination of Consumer Behavior for Search and Experience Goods, *Journal of Marketing*, 73, 2, 55–69.

13. Ickler, H., Schülke, S., Wilfling, S. and Baumöl, U. (2009) New Challenges in E-Commerce: How Social Commerce Influences the Customer Process, *Proceedings of the 5th National Conference on Computing and Information Technology, Bangkok, Thailand*, 51–57.

14. Moorthi, Y. (2002) An approach to branding services, *Journal of Services Marketing*, 16, 3, 259–274.

15. Mudambi, S. M. and Schuff, D. (2010) What Makes a Helpful Online Review? A Study of Customer Reviews on amazon.com, *MIS Quarterly*, 34, 1, 185–200.

16. Nelson, P. (1970) Information and Consumer Behavior, *Journal of Political Economy*, 78, 2, 311–329.

17. O'Brien, R. M. (2007) A Caution Regarding Rules of Thumb for Variance Inflation Factors, *Quality & Quantity*, 41, 673–690.

18. Roe, B. and Sheldon, I. (2007) Credence Good Labeling: The Efficiency and Distributional Implications of Several Policy Approaches, *American Journal of Agricultural Economics*, 89, 4, 1020–1033.

19. Rosenberg, S. D., Schnurr, P. P. and Oxman, T. E. (1990) Content Analysis: A Comparison of Manual and Computerized Systems, *Journal of Personality Assessment*, 54, 1&2, 298–310.

20. Schnurr, P. P., Rosenberg, S. D., Oxman, T. E. and Tucker, G. (1986) A Methodological Note on Content Analysis: Estimates of Reliability, *Journal of Personality Assessment*, 50, 4, 601–609.

21. Stock, J. H. and Watson, M. W. (2011) Introduction to Econometrics, Pearson Education, Upper Saddle River, N.J, Harlow.

22. Stone, P. J. and Hunt, E. B. (1963) A Computer Approach to Content Analysis: Studies Using the General Inquirer System, *Proceedings of the AFIPS Spring Joint Computer Conference*, 241–256.

23. Stone, P. J., Bales, R. F., Namenwirth, J. Z. and Ogilvie, D. M. (1962) The general inquirer: A computer system for content analysis and retrieval based on the sentence as a unit of information, *Behavioral Science*, 7, 4, 484–498.

24. Weber, R. P. (1983) Measurement models for content analysis, *Quality & Quantity*, 17, 2, 127–149.

25. Weber, R. P. (1984) Computer-aided content analysis: A short primer, *Qualitative Sociology*, 7, 1, 126–147.

26. Zhu, F. and Zhang, X. (2010) Impact of online consumer reviews on sales: the moderating role of product and consumer characteristics, *Journal of Marketing*, 74, 2, 133–148.