

The Effect of Asymmetric Information on Consumer Trust in E-Commerce and a Field Work

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ABSTRACT

The purpose of this article is to investigate the effects of asymmetric information on consumer trust. Three hypotheses have been analyzed to understand the effects of asymmetric information on consumer trust. Regression analysis was used to analyze the effect of technological factors, asymmetric information and adverse selection on consumer trust. According to the results obtained, it is understood that consumers who shop through e-commerce do not fully know the rights given to them by the Consumer Law No. 4077, that the sources of worry and trust problems that consumers have experienced while doing e-commerce are caused by lack of information and additionally adverse selection and moral hazard caused by asymmetric knowledge poses a serious problem for e-commerce. Making efforts to raise awareness about the rights of the consumers by informing them about the Consumer Law numbered 4077 will contribute greatly to the development of e-commerce. This study adopts a unique perspective to identify problems and solve problems that prevent the development of e-commerce and affect consumer trust in e-commerce.

Keywords: E-Commerce, Asymmetric Information, Adverse Selection, Moral Hazard.

INTRODUCTION

We are now aware of how the Internet has evolved since the 90's when it entered our lives. Within the start of shopping online in 1995, e-commerce has been moved to a different dimension until today. With the arrival of the internet, our communication technology has developed more rapidly and the Internet has become more of a medium that facilitates many difficulties and communication in our lives. Beginning to utilize the new situations of the real markets which have been moved to the virtual market until the end has brought a very different dimension to the commercial as well.

Nowadays, it is more attractive to be in the virtual market than being in a real market. present in the virtual market because it allows you to reach more people at a lower cost, without suffering from geographic difficulties. For this reason, the number of offeror on the internet increases day by day. As this number increases, as in everywhere, the virtual market has started to occupy good and bad sellers. Now that the things are not felt by touching, consumers have to rely on the information each buyer gives.

A lot of information pollution can turn into a serious problem for the future of internet trade.

Consumer trust is essential in shopping which cannot be done face-to-face. The effect of adverse selection and moral hazard problems resulting from asymmetric information on trust in e-commerce might adversely affect the fate of the virtual market which will be much better and advantageous than the real market in the future.

INFORMATION CONCEPT AND INDETERMINACY CONDITION

In addition to the fact that the concept of "indeterminacy" has a meaning covering the risk, "risk" is more frequently expressed today as one of the main determinants of human activity. The "information-driven" character of human behavior is becoming a "risk-oriented" character. As the forms of behavior are "knowledge-intensive", the risk here comes to the forefront besides the information mentioned here, and it is possible to talk about "risk-intensive" behaviors. (Yalçinkaya, 2004, 2-3) If there is an indeterminacy in the results, this brings risk with it. In this case, we can talk about a close relationship between information, risk and indeterminacy (Fidan, 2014: 7).

DEFINITION OF INFORMATION

Information, in the shortest sense, is the processed data. It is the source of information

that removes or reduces uncertainties about a topic. (Shannon, 2013: 2-4) When it comes to making a choice, what we need is information. It is also the information that changes things we already know. For this reason, information is mostly defined by considering its effects. Today, technology is the effective and most important tool to acquire, create and reach knowledge. The advent of new technologies has also caused the change of communal living, and our shopping culture has also been affected. Organizations that have succeeded today are those that have largely adapted the change in economic structure and have used more specific information than their opponents and increased competition (Uçak, 2010: 707-708).

DEFINITIONS OF INFORMATION ACCORDING TO DIFFERENT APPROACHES

According to Aristotle, the process of acquiring knowledge begins with experience and our memories follow repeated sensory experiences. The person who gain experience can make inferences about the universal nature of the substances with the intuition process (Çalık and Çınar, 2009: 78)

Plato's view of information is dogmatic. The information already hidden in the spirit comes to mind with recollection. A person searches for something he already knows, not what he does not know. (Güzel, 2003: 105-115). Socrates, like Plato, believes that the soul has all the

information, and tells that they should be activated by some questions, inquiries and warnings to be active in the human beings (Aydın, 2008: 8). According to Farabi, information is a phenomenon used to facilitate life. If knowledge gives happiness to man and if it heals problems, sorrows, pains in his life, then it can be called knowledge. If information gives happiness to man, if the problems of man's life, sorrows and sorrows heal, then this knowledge can be called (Özgen, 2013: 133-140).

According to Descartes and Hegel, first of all, all the propositions must be rationalized, and afterwards they are saying that the knowledge of senses is also misleading, expressing the need to remove suspicion. The truth is the idea. In this case, the starting point of any kind of information is idea or the things in consciousness. (Yıldırım, 2013: 97-129)

Jhon Locke and David Hume argue that the information on the inside is not innate. Hume thinks we only know what we have gained through experience, and defend the inability of the knowledge acquired independently from experience. (Çalık and Çınar, 2009: 79)

Kant has argued that no truth can be known forever, as well as advocating for agnosticism, that's to say that knowledge cannot go beyond the world of experiment. Besides being able to have knowledge from birth, we can also have knowledge later on. (Öktem, 2004: 35-50).

Table1. Information Definitions (Fidan,2015:8)

Approach	Researchers	Definition
Rationalism	Socrates Plato Aristotle Farabi Descartes Hegel	Knowledge is the beliefs formed by reason and mind. Using our logic to reach all the information is enough.
Empiricism	Jhon Locke David Hume	Knowledge is the beliefs formed as the result of experiments and observation. There is only experimentation at the source of information. People do not have dogmatic knowledge.
Criticism	Immanuel Kant	Knowledge is logicalized and / or reasoned beliefs. Knowledge can be obtained from birth as well as later on.

Technical knowledge is the information that can be produced by passing through the filters in the scientific process and used as input in production. Law of increasing returns will be valid instead of law of diminishing returns when knowledge is used as a variable input in knowledge production function because knowledge is not a scarce factor of production like capital, land and so on in knowledge society. Because knowledge, unlike other production factors, increases productivity as it

is used, but also increases as the share is increased. On the other hand, knowledge is not complementary production factor such as capital and land, but rather a production factor that can be substituted for capital and land (Özsağır, 2007: 48-53).

The development of technological and scientific knowledge in the last two centuries has created a dynamic element that is gaining an importance

in the economic and social history of the world. The end result is often called the knowledge economy. The emergence of new technological ideas, but also the easier access to information in society, social networks including universities, broadcasters and occupational sciences have affected the growth in the western world in these two centuries. The rich historical findings, arranged in a clear and vivid manner, show that changes in the intellectual and social environment have led to the production of knowledge as well as the dissemination of knowledge, and that the institutional past have led to the Industrial Revolution and that the ongoing technological change has followed the sustainable economic growth (Mokyr, 2002: 1-3).

Today, instead of the knowledge economy, the "new economy" term, which has become almost a slogan, is being used more and more. The source of this change is the developments experienced in the US economy during the relevant period. (The high growth rate seen in the 1990s in the US economy has attracted the interest of many researchers and economists. As inflation rates fell (1990-95 average of 1.7 percent), they investigated the reasons for this high performance of the economy and this period of declining unemployment (1990-95 average of 4.6 percent). As a result of their research, they have seen the productivity increases caused by investments in information and communication technologies under such high performance. This high economic performance is called "new economy". At the beginning of the 2000s, demand for ICT (information and communication technology) and "dot.com" (e-commerce company on the internet) burst (Eliasson, 2004: 241-243).

ASYMMETRIC KNOWLEDGE, ADVERSE SELECTION AND MORAL HAZARD

The most important work in the asymmetric information theory is the one done by George Akerlof in 1970. He has reviewed the second hand car market and has stated that sellers always have more knowledge from buyers, and this knowledge difference is a source of adverse selection. Buyers know that there are good and bad cars in the market and even want to buy better cars at a cheaper price. (Şen, 2006: 3) There will be more bad car owners on the market as the quality car owners will give up selling their cars lower than their worth. In this case, with one of the parties having more knowledge, the buyer who wants to buy a quality car at a cheap price will get a car both at a cheaper price and with a

lower quality, so there will be an adverse selection (Alp and Karakas, 2008: 219).

The moral hazard is a situation that arises after shopping is completed. Briefly, we may refer to any one of the contracting party as acting differently than his way of acting during the time until the completion of the contract. "The *moral hazard* is that when one side is responsible for someone else's interest, it has the motivation to think first of its own." Asymmetric information is also of great importance nowadays because the shopping is done from the internet. Especially in shopping where information is lacking and face-to-face transactions can not be done, the customer takes risks and therefore it requires trust (Vardareri and Dursun, 2010: 140-141).

ELECTRONIC TRADE

We can define e-commerce as the combination of the possibilities of access to internet masses by using the broad possibilities of traditional information technology (IT) systems. It brings together the elements of an exchange - sellers, suppliers, traders and consumers - with the Web channel in such a way that it is not possible in any other case. Companies selling goods and consumers wherever they are in the world can make purchases online. Organizations doing business over the web naturally communicate more easily with their customers and do more work (Marangoz, 2011: 184).

The Friedy approach refers to the advantages of "selling computer chips instead of atoms" because E-commerce has abolished situations such as waiting in traffic, spending energy, causing air pollution, or losing time in shopping. To keep pace with the pace of social change and to be able to take part in the rulers' class, a vision that takes account of the impact of the technological environment on economic processes should be undertaken and not just states but also businesses should have this factor. (Özcan, 2007: 55) According to the general view, globalization has developed in our life with two main events. The first one is the developments in technology that accelerates innovation in telematics, computers, satellites and other communication media, and the combination of television, global multi media, and electronic capital market transactions and the global explosion that is experienced on the internet with e-commerce (Özcan, 2007: 94).

CHANGES CAUSED BY E-COMMERCE

Electronic commerce is already expected to lead to radical changes in some issues. If we would

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sort them; E-Commerce is carrying the market place from a concrete plane to a virtual plane. The change of the market place may not be considered as important by itself, but the advantages it has provided for the place expense and the shopping methods have turned into a totally new shape. The buyer-seller relationship is completely transformed into a new style. With the transfer of the buyer-seller relationship to the virtual platform, the traditional intermediary has been removed. This marketplace is the most fundamental point of transformation. E-Commerce has an effect of accelerating the buying and selling and accordingly it has a widespread effect.

Especially with the development of technological background among the enterprises, the speed spread processes of economic transactions are also developing. E-Commerce continues to increase the intensity of economy. Economic relations between large corporations and smallholder firms and consumers are reinforced by e-commerce. This provides great convenience not only for large firms

but also for small goods and service providers to work on the world scale and for lifting geographical boundaries. E-commerce reduces the business and transaction times to the minimum, and in some cases removes it.

(http://www.elektronikticaretrehberi.com/e-ticaretin_etkileri_faydalari.php#bolum_2.1.2)

The basic economic impact of electronic commerce is that it creates an area of economic activity with fewer barriers. This effect comes from a result that is mainly caused by rapidly developing information and communication technologies.

Since e-commerce uses rapidly developing and evolving infrastructure, its impact on economic life will also be great. Since electronic commerce brings together all producers, suppliers, dealers and consumers, it is thought that it has the characteristics to turn commercial dreams into reality with the production of goods and services imagined since the industrial revolution. (Altınok, Sugözü and Çetinkaya, 2002: 2).

E-COMMERCE AND INTERNET USAGE IN TURKEY AND IN THE WORLD

Table2. *E-commerce and Internet Usage in Turkey and in the World (Marangoz, 2011:190).*

Number of Internet users in the world	2 billion people
The volume of E-Commerce in Turkey in 2010	15 billion dollar
Number of Internet users in Turkey	35 million people
Number of people using Internet in Turkey with 3G service	1.1 million people
Number of broadband Internet subscribers in Turkey	8.1 million people
3G subscribers in the world	16.6 million people
E-Commerce in China, the world's largest online market volume	39.9 billion dollar

Looking at the picture above, it seems that people should not remain indifferent in E-commerce. From an economic point of view, it is inevitable that everyday a more globalizing world is creating serious threats to businesses that are in a distant position in e-commerce. We can list these threats briefly as follows (Bucaklı 2007: 120) :

- Not being able to find a market in global economy
- Losing the existing markets
- Failing to compete with countries with high e-commerce volume and with local companies that are implementing e-commerce applications

The following are two main factors having the effect of reducing production cost. First, electronic commerce changes the cost structure of the firm, then the cost of backwards and forwards relationships with other businesses is reduced. (Altınok, Sugözü and Çetinkaya, 2002: 2)

CONSUMER TRUST AND BUILDING TRUST

Trust has an important place in the making and shaping of decisions by buyers and sellers, which is why it is an important force influencing the markets. Trust is essential to ensure continuity in the markets. One of the main objectives of businesses has been to gain consumer trust because of the fact that trust have been influential at such a critical level in buyers' and sellers' decisions. (Fidan, 2014: 74)

In times of indeterminacy, consumer trust is decreasing, which is why consumers respond to this by reducing their consumption and producers respond by reducing production. On the contrary, consumers increase their consumption and cause the economy to revive. The optimism of consumer trust will lead the consumer to want to spend. Trust, therefore, is an important factor that affects consumers' purchases and that businesses should try to earn (Arisoy, 2012: 305).

AIMS OF INTERNET USAGE IN TURKEY

According to the Turkish Statistical Institute's publication for 2015, there is a serious relationship between the use of the Internet and the age and education level. According to this data, the highest rate of use is 77% with 16-24 age group. The rate of internet use in high school and equivalent education level is 80.6% while it is 94.1% in higher education, faculty and post graduate education. Among Internet users, the rate of order placement or purchasing goods or services using the Internet is 33.1% in 2015 and 34.1% in 2016.

CONCEPTUAL FRAMEWORK AND HYPOTHESES

As seen in our daily life with the entrance of the internet, the volume of e-commerce is increasing every day. The biggest problem in the e-commerce sector is the trust based on lack of information. The seller has every piece of information about the product, and the buyer has only this information as much as he has obtained from the seller. Since there is no face-to-face shopping, the buyer has to accept the written information about the product as correct. This study will help to understand the effects of asymmetric information on consumer trust.

H1: There is a relationship between technological factors and personal trust tendency.

H2: There is a relationship between adverse selection and personal trust tendency.

H3: There is a relationship between moral hazard and personal trust tendency.

METHODOLOGY

A survey was conducted with 230 people in the province of Gaziantep in line with the purpose and limitations of the research. 30 of the collected surveys were excluded from the analysis due to the lack of appropriate marking or the absence of answers.

The demographic characteristics of the subjects included in the sampling are summarized in Table 3. According to this, 54% of the sample consists of male and 43% female. When assessed according to educational status, 56% constitutes bachelor option.

In the first part of the survey, participants were asked about general shopping tendencies as consumers and information about the legal rights of consumers in e-commerce.

According to these results, while 46.50% of the participants used product purchasing preferences for clothing, book-CD option was 19%.

31% of survey respondents never had problems with product delivery although 33% stated that they had problems after delivery.

Only 15.50% said that they could get a product from the internet that they could get by spending the entire amount of their income.

According to the survey, only 22% of the consumers know the legal rights of shopping on the internet and this question was answered by 64.50% of the consumers as partly.

For the question; most important thing for you in internet shopping sites, 49.50% of the consumers chose the item; the site should give the correct information. 48.50% chose the appearance of the site as the least important thing on the site.

İnternet sitelerinde kullanılan ve en güvenli hangisini bulduklarına dair olan anket sorusunda %54 güvenlik sertifikalarının ne olduğunu bilmediklerini belirtmiştir(Şekil 2.)

Although 75% of the respondents said that they have credit cards, 54% of them said that they use credit cards in their internet shopping. The highest rate is 34% with cash on delivery.

On the Internet, 56% of participants did the latest product research within one week and 25% of them bought the product within last one week. And 38% stated that they bought the product from the internet within last one month.

SCALES, RELIABILITY AND VALIDITY ANALYSIS IN STUDY

While preparing the survey form, the surveys that were included in the studies on trust in literature before (Aiken, 2001:120-131; Chen, 2006:96-103; Gefen, 2000:735; Gefen, Karahanna ve Straub, 2003a:84-85; Gefen, Karahanna ve Straub, 2003b:315; Jarvenpaa, Tractinsky ve Vitale, 2000:65-67; Kim, Ferrin ve Rao, 2008:558-560; Wang, 2010:132-134) and also the studies including surveys on asymmetric information were benefited (Hitosugi, 2009: 209-214; Pavlou, Liang ve Xue, 2007:135-136; Wolf, 2006:102-106).

When the previous studies on trust formation in the literature are examined, it is seen that the factors affecting trust in e-commerce are mostly originated from consumers, sellers and technology related reasons. (Kim et al., 2005: 148) In order to measure the problems arising from asymmetric knowledge, related questions in the scale were prepared in the context of adverse selection and moral hazard and these questions were arranged by Hüseyin FİDAN as there was no study in the literature that separately measures the effect of adverse selection and moral hazard on e-commerce trust.

Table3. Demographic Characteristics of the Sample

		Frequency	Percentage	Valid%	Total%
Gender	female	86	43	44,3	55,7
	male	108	54	55,7	100
Age	15-24	94	47	47	47
	25-44	94	47	47	94
	45-64	11	5,5	5,5	99,5
	Over 65	1	0,5	0,5	100
Education	Primary School	12	6	6	6
	Secondary School	11	5,5	5,5	11,6
	High School	14	7	7	18,6
	associate	19	9,5	9,5	28,1
	bachelor	112	56	56,3	84,4
	MA	30	15	15,1	99,5
Income (TL)	PhD	1	0,5	0,5	100
	0-499	28	14	14	14
	500-999	38	19	19	33
	1000-1499	39	19,5	19,5	52,5
	1500-1999	23	11,5	11,5	64
	2000 and over	72	36	36	100

Table4. Results of Exploratory Factor Analysis

	Questions	F1(TF)	F2(KG)	F3(TS)	F4(AT)
	Shopping sites take the necessary precautions				
TF1	to protect the personal information.	.74			
	Websites that look nicely designed are more				
TF2	secure.	.71			
	I find Internet shopping sites that are easier to				
TF3	use more secure	.62			
TF4	Internet sites with more product types are more secure.	.51			
	It's a long time to trust the people I've just				
KG1	met.		.66		
	I always use the sites that I trust when				
KG2	shopping.		.63		
	I find the companies that have been selling on the Internet				
KG3	for many years more reliable.		.63		
	Before I shop, I do research about				
KG4	the site		.47		
	Companies on the Internet may show poor quality				
TS1	products as quality.			.77	
	When shopping on the Internet, different products may				
TS2	come from the specified property and quality on the site.			.70	
	It is safer to use the shopping sites used by				
TS3	everyone.			.62	
	While buying a product from the Internet, I find it				
TS4	difficult to find the product I want.			.43	
	Internet shopping sites provide incomplete information				
AT1	about their products.				.73
	Once you have purchased the product, the companies				
AT2	behave differently than they would on your site.				.66
	Internet shopping sites give insufficient information				
AT3	about themselves.				.39
	Without a reason, I can get the product back without the				
AT4	unconditional return period of the product I bought.				.66
	Factor Eigen value:	3,40	2,05	1,91	1,30
	Variance Percent Explained by Factor	17,8	10,78	10,08	6,86

Explained total variance (%)	51,71
Tests	
Kaizer-Meyer- Olkin Test (KMO):	.65
Barlett's Test of Sphericity:	Sig=.000(p<.05)
Cronbach's Alpha:	.687

Survey method was used as data collection tool in the study. The survey form is composed of 3 parts. In the first part, questions about consumer's general shopping tendencies and consumers' legal thinking were asked. In the second part, there were questions prepared with 5-point Likert scale to determine e-commerce trust tendencies and factors affecting trust. In the third part of the survey, there is a section on demographic characteristics.

A five-point Likert scale was used to measure the effect of asymmetric information-related problems on consumers' trust tendency in e-commerce on the questionnaire prepared to determine the degree of the effect. (1-Never... 5-Always)

In this context, it was decided that the contribution of twelve items to the explained variance was low, and that of the seven items tended to be cross-loaded. As a result of the reapplied KFA, it was found that the research is a four-factor structure consisting of 16 items and the total variance of factors was 51,713 .

In the study, the data of the sampling were subjected to exploratory factor analysis to examine the construct validity. It was observed that the result of the Barlett normal distribution test was significant ($p < 0.05$) and KMO (Kaiser-Mayer-Olkin) value was 0.658 in the result of the analysis to test the suitability of the data for factor analysis. A five-factor result was obtained as a result of KFA analysis. Taking into consideration yamaç serpinti grafiği and the variances explained by the factors, it was seen that the four factor model was more appropriate. In this context, it was decided that a total of 19 items should be removed from the scale since the contribution of twelve items to the explained variance was low, and seven items had a tendency to cross over. It is determined that the restructured KFA was a four-factor structure of 16 items and the total variance of the factors was 51.713.

Reliability analysis of the scale consisting of 16 items was made by calculating Croanbach's alpha value. Croanbach's alpha value of the scale is 0.687. This value is above Nunnally's (1978) acceptability level when interpreted in terms of level of reliability.

CORRELATION TEST RESULTS

A simple correlation analysis was used to determine whether there is a significant relationship between asymmetric information and customer trust in E-commerce. The results of the analysis showed that there is a significant

positive correlation between moral hazard and adverse selection ($r = .45, p < .0001$). According to these results, H4 hypothesis is accepted. The existence of a positive relationship between variables indicates that two variables have changed together. In other words, moral hazard and adverse selection increase and decrease together. Two variables have the highest value among correlations.

The results of the analysis showed that there is a significant and positive relationship between personal trust tendency and moral hazard ($r = .33, p < .0001$). According to these results, H3 hypothesis is accepted. The existence of a positive relationship between variables indicates that two variables have changed together. In other words, moral hazard and personal trust tendency increase or decrease together.

The results of the analysis showed that there is a significant and positive relationship between adverse selection and personal trust ($r = .29, p < .0001$). According to these results H2 hypothesis is accepted. The existence of a positive relationship between variables indicates that two variables have changed together.

According to the results of the analysis, the relationship between the personal trust tendency and the technological factors showed a significant and positive relationship for them although it has the lowest value among the correlations ($r = .22, p < .0001$). According to these results, H1 hypothesis is accepted.

According to the findings of multiple correlation analysis, it is seen that there is a positive relationship between personal trust tendencies, moral hazard, technological factors and adverse selection factors of e-commerce users.

Table5. Independent Sample T Test Results

gender	N	mean	S.S	S.D	t	p
male	106	3,38	,552	185	-,570	,569
female	81	3,43	,592			

Table6. Regression Analysis Results (Dependent variable KGE)

Variables	R square	Beta	t	relevance	relevance
A T.	,369	,136	-,252	2,823	,001
T F.			,044	,520	,003
T S.			-,143	1,761	,000

According to the findings, it was found that there is no significant difference between gender and adverse selection relations. ($t(185) = -, 570; p < 0,05$). Although the average of females was higher than that of males, no significant difference was found between males' adverse selection

averages (mean: 3.38, SD = 0.054) and women's adverse selection averages (mean: 3.43, SD = 0.065).

In the table, regression analysis values are seen with KGE as dependent variable and TS, AT and TF as independent variable. The R2 specificity coefficient, which is the explained ratio of the dependent variable by the independent variables, is 13.6%. There is a negative effect of AT and TS on KGE. It also has a positive relationship with technological factors. The mean, standard deviation and correlation coefficients for the variables are given in Table 11 and Table 12. When Beta values are taken into consideration, K.G.E is affected by technological factor the most and by moral hazard the least.

H1, H2, H3 hypotheses have been accepted according to the results of regression. In the equation in which there is a negative relation between personal trust tendency and adverse selection and moral hazard, it was seen that personal trust tendency is adversely affected by increasing asymmetric information problems.

CONCLUSION AND DISCUSSION

In this study, the problems caused by asymmetric information in e-commerce which has an increasing number of users and transactions day by day were examined and how these problems affect the trust on e-commerce was investigated. It is an important initiative to identify the problems that arise especially for the development of e-commerce in the emerging markets.

The source of the anxiety and trust problems that consumers experience while doing e-commerce is lack of information. In addition to this, the biggest problem that consumers experience is the wrong or missing information on the internet sites. According to the results, it seems that the problems of adverse selection and moral hazard arising from asymmetric knowledge are serious problems for e-commerce.

According to the study conducted, consumers who shop through e-commerce stated that they do not fully know the rights given to them by the Consumer Law No. 4077. Therefore, awareness raising activities for consumers to know what their rights are will make a great contribution to the development of e-commerce.

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Citation: Yakup, Durmaz, and Kılınç Neslihan. "The Effect Of Asymmetric Information On Consumer Trust In E-Commerce And A Field Work." *International Journal of Research In Business Studies And Management*, vol 4, no. 10, 2017, pp. 1-9.

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