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Analyzing the Factors Affecting E-Commerce in Turkey

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Abstract

Recently, e-commerce usage has been increasing in the world thanks to the rapid development of science and technology. Also in Turkey, it began to be used by the consumers and firms due to the various advantages. The aim of this study is to analyze the factors affecting e-commerce development in Turkey. The study consists of three parts. In the first part, general information about e-commerce has been given. In the second part, literature has been reviewed. In the third part, econometric analysis has been made. Factors affecting e-commerce in Turkey have been analyzed by using vector autoregressive (VAR) model. Monthly macro data for the period between 2010 and 2014 has been used for the analyses. Empirical evidence shows that consumer price index, import and credit card usage are significant factors affecting e-commerce in Turkey.

Keywords: E-commerce, Time Series Analysis, Vector Autoregressive Models.

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Introduction

Buying and selling of goods and services over the internet is called e-commerce. In recent years, with the rapid development of science and technology, shopping on the

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internet has become widespread all over the world. Companies and consumers have begun to adopt e-commerce in addition to traditional commerce in a short time.

E-commerce has provided many conveniences to both companies and consumers. Companies had the opportunity to reach consumers more easily through e-commerce. Today, any e-commerce company can reach consumers in the other end of the world and can sell its products more easily. With e-commerce, operational costs can also be minimized. Companies that want to assess these advantages enter into e-commerce sector. Also, consumers can reach a wider range of products and find the opportunity to shop from home all day without the need to go to store and without distance limitation with a better quality of service.

E-commerce began to develop in the 90s with the birth of the web in the world and it has been improving rapidly. Today, internet has become preferred for many products such as apparel-accessories, accommodation, furniture, food, book etc. In the world, there were 3,035,749,340 internet users in 2014, while this value was 360,985,492 in 2000. Global e-commerce volume was 638 billion dollars in 2013 and it is expected that it will reach to 1,346 trillion dollars by 2018 (Afra, 2014).

Turkey has also started studies for e-commerce in 1997. Since then, many projects have been made to develop e-commerce usage in Turkey. When we come to 2014, Turkey's e-commerce transaction volume reached to 41 million TL and continues to develop rapidly. Also, the number of Internet users has exceeded 35 million and 48 per cent of internet users use internet with the purpose of banking transactions and online shopping in Turkey.

Studies regarding e-commerce development and growth are increasing in recent years. In these studies, social, cultural and economic examinations are being made. There are many economic factors that affect e-commerce development and growth. Internet, inflation, GDP per capita, and communication infrastructure are some of these factors. The aim of this study is to analyze the factors affecting e-commerce in Turkey.

E-commerce in the World

E-commerce is individuals, private or public institutions to make their commercial activities in electronic form. These activities include production of goods or services, advertisement, sale and purchase, and distribution processes. These processes depend on the transmission of the digital data to the parties engaged in the trade electronically.

E-commerce is a new concept that emerged with the birth of the web in 1990s. However, laying foundation of the internet started around the 1960s. In the 1960s, ARPANET computer network has been developed by The United States Defense Department in order to connect researchers and academicians. ARPANET was firstly used in four different universities in the United States, and then began to spread to other universities around the world.

In the 1970s and 1980s Internet provided its users to exchange information and banking transfers. In 1983, it became the main medium of data transmission (Mirescu, 2010).

The number of computers began to increase in the same years and became widespread. Internet commerce began with the emergence of the web in 1990s. Amazon was found in 1994, eBay and Yahoo was found in 1995, and many more companies entered into the online market.

Between the period of 1995 and 1999 is considered as a true golden era for the web (Mirescu, 2010). In 2000, securities on NASDAQ lost a great value and the dot com crisis occurred. With this crisis, many companies that entered the market had gone bankrupt. However, big companies such as Amazon, eBay have survived.

In the world, history of e-commerce is short, however continues to spread rapidly.According to the latest data, in the world, there are 3,035,749,340 internet users in 2014, while this value was 360,985,492 in 2000.[1]

According to Goldman Sachs, global e-commerce volume is 638 billion dollars in 2013. And this value will increase to 1,346 trillion dollars at the end of 2018 (Afra, 2014). Figure 1 shows the past and estimated values of global e-commerce volume between 2011 and 2018.

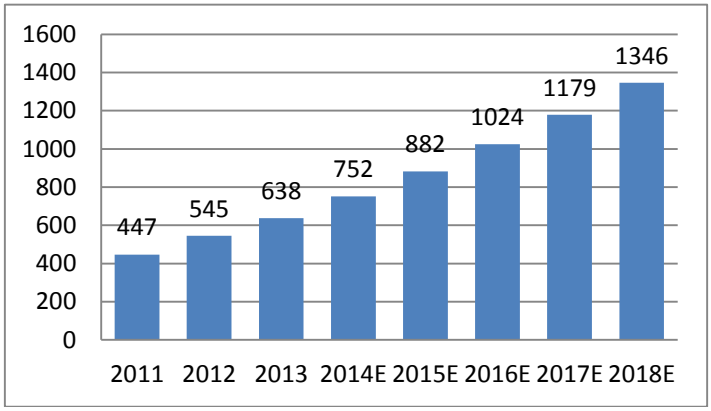

Figure 1 Global E-Commerce Volume (Billion $)
Source: Afra (2014**)**

The volume of global e-commerce is increasing constantly since 2011. Growth rate of global e-commerce volume is 26%, 22%, 17%, 18%, 17%, 16%, 15% and 14% respectively between 2011 and 2018 (Afra, 2014).

Figure 2 shows the regional distribution of global e-commerce volume in 2012.

[1] Retrieved May 10, 2015, from http://**www.internetworldstats.com**/stats.htm.

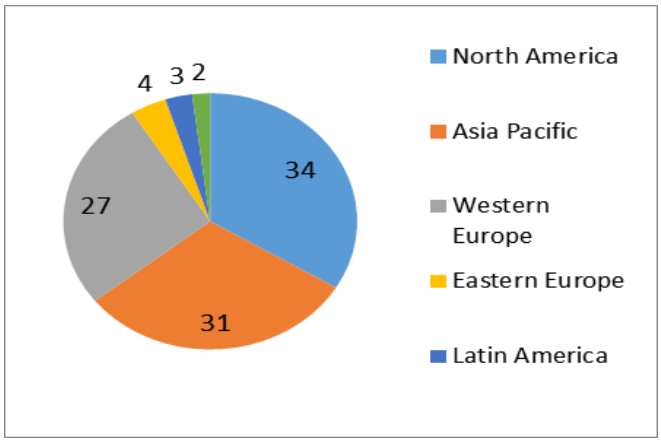

Figure 2 Regional Distribution Of Global E-Commerce Capacity (%) (2012)
Source: Sezgin, 2013

North America has the largest volume of e-commerce in the world in 2012 (Sezgin, 2013).

E-commerce in Turkey

22 years has passed since the acquaintance of Turkey with the internet. The first internet connection in Turkey was held at METU Information Processing Departments on April 12, 1993.

The topic of e-commerce firstly was brought up by the SCST at the meeting in August 1997. At the meeting, it was decided to create a working group to establish e-commerce network and to make it widespread in Turkey. After this decision, ETKK (Electronic Commerce Coordination Committee) was established. At ETKK meeting on February 16, 1998, legal, technical and financial working groups were formed.

In 1996, prime minister asked for the creation of an information infrastructure master plan to accelerate the transition to information society, and to develop information technology in Turkey. Therefore, a study was initiated in July 1997. Coordination of this study was carried out by the ministry of transport and secretarial services were conducted by SCST.

With circular of the prime minister dated March 19, 1998, Public-Net Supreme Council and Public-Net Technical Council was established to evaluate and to monitor the activities which is made about public computer networks.

In 2000, e-Europe project has been completed by the 15 EU member countries. This project's issues were cheap communication and the spread of faster and more reliable internet use. Then, e-Europe+ initiative was launched for the candidate countries. According to this initiative, candidate countries needed to reach the targets that member countries reached until the end of 2003. Therefore, e-Turkey initiatives were launched by the prime minister in 2001. 13 working groups were created. ETKK continued to serve as an e-commerce working group which is one of these working groups. This group joined e-Europe+, e-Turkey I. Interim Report and e-Turkey initiative studies.

In 2003, e-Transformation Turkey work was initiated by the DPT Information Society Department. Working groups that established under e-Turkey attempt has been revised. Ministry of development was commissioned for this project. The aim of this project was to create a state structure which adopts having transparent, effective and simple business processes as a principle in order to provide better quality and faster public services.

On November 4, 2003, 2003-2004 Short-Term Action Plan was introduced. Later, 2005 Action Plan was prepared.

In 2007, Turkish e-Transformation Executive Board, Committee of Transformation leaders, and Advisory Committee was created.

At the end of 2008, overseas e-commerce project was carried out by the undersecretariat of customs and undersecretariat of foreign trade.

2014-2018 Information Society Strategy and Action Plan is the last project that Ministry of Development carries out within the scope of its task about preparing strategy and action plan.

As a result of all works, with the development of technology, rapid and large increase in both the number of Internet users and the volume of e-commerce transactions have occurred.

Figure 3 shows the development of the percentage of internet users in Turkey between 2000 and 2013.

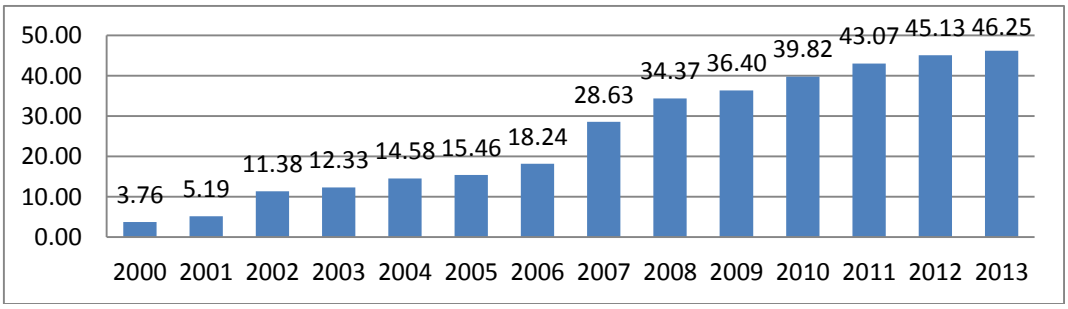

Figure 3 Percentage of Internet Users in Turkey
Source: ITU

While the percentage of internet users was 3.76 in 2000, it has been increased by 12 times and became 46.25 per cent in 2013.

Figure 4 shows the development of e-commerce volume in Turkey between 2009 and 2014.

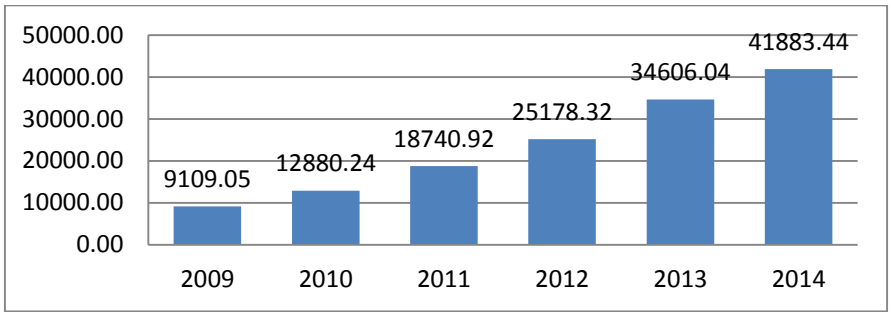

Figure 4 E-Commerce Volume Development of Turkey (Million TL)
Source: BKM

As it is seen in the figure 4, e-commerce volume is increasing in Turkey. When e-commerce volume of Turkey is 9, 1 billion TL in 2009, it increased to 25, 1 billion TL in 2012 and 41, 8 billion TL in 2014.

While the share of the online retail in total retail is 1.3 per cent in Turkey in 2013, this value is an average of 5.5 per cent in developed countries and 3.5 per cent in developing countries.

Literature Review

Factors affecting e-commerce has been investigated by many authors in Turkey and abroad. This part of the thesis is devoted to the results of these studies. Studies were listed according to the date of publication.

Gibbs, Kraemer and Dedrick (2002) found that factors affecting B2B and B2C e-commerce vary. Global competition, participation in global production networks and openness are important factors shaping B2B e-commerce, while B2C e-commerce are shaped by national and local environment such as consumer preferences, retail structure, local language and cultural factors.

Wong (2003) examined global and national factors affecting e-commerce diffusion in Singapore. He found that investment of information and communication technologies (ICT) infrastructure has facilitated the development of e-commerce in Singapore. Singapore's dependence on global MNCs is a positive factor for e-commerce diffusion. Also, active government policy has a positive influence on e-commerce and stronger government policies are needed, such as promotion of technological innovation and entrepreneurship. Direct subsidies, fiscal incentives and tax incentives are also important factors that affect e-commerce diffusion.

Molla and Licker (2005) studied e-commerce adoption in developing countries. They discussed e-readiness notion in their study. They analyzed perceived organizational e-readiness (POER) and perceived external e-readiness (PEER). POER includes awareness, commitment, human resources, technological resources, business resources and governance. PEER includes government e-readiness, market forces e-readiness and supporting industries e-readiness. As a result, they found that organizational factors are more important than external factors for e-commerce adoption in developing countries.

Weixin (2006) investigated factors affecting e-commerce diffusion in China. In his paper, factors are divided into two groups as national environment and national policy. He suggested that IT infrastructure, political and economic reforms are important factors for e-commerce development in China.

Ardura, Artola and Requena (2008) analyzed factors influencing the evolution of e-commerce in the Spanish market. They used time series data for the period of 1996 and 2003. The variables which they used to analyze the evolution of e-commerce are the number of internet users, technological and legal changes, price of computers and the number of servers with the ".es" domain that use security protocols per 1000. As a result, all variables which they used in the analyses were found as significant variables for evolution of e-commerce in Spanish market.

In a study worked by Turen, Gokmen and Tokmak (2011), factors affecting the volume of e-commerce transactions in Turkey were investigated. number of Internet users, per capita GDP, inflation, change of legal legislation that supports e-commerce, and economic crisis factors were determined as independent variables, a multiple linear regression model were created with these factors, the effect of these factors on e-commerce transaction volume has been tried to explain. In the study econometric analysis was conducted by using monthly data between 2004 and 2011. As a result of the analyses, they found that the number of Internet users, per capita GDP, and changes in legislation which are made in 2005 affect e-commerce transaction volume positively, while the economic crisis of 2009 and inflation affect e-commerce transaction volume negatively.

Toyin and Damilola (2012) investigated abandonment factors affecting e-commerce transactions in Nigeria. They used survey to collect data. Surveys were administrated to the six geo-political zones of Nigeria. The responses of participants were analyzed by using correlation analysis and stepwise multiple regression analysis. They used abandonment as a dependent variable. Independent variables were risk, navigation, finance and purchase. They also used two dummy variables. These variables are age and level of education. Analyses' results show that risk, navigation, finance and purchase have significant impact on the abandonment of online purchases. But, age and level of education don't have significant impact on the abandonment of online purchases.

Sayili and Buyukkoroglu (2013) analyzed the socio-economic factors affecting purchasing foods through e-commerce in Tokat. They used survey to collect data. Logit model and an estimator model was developed. The variables which were determined in their study are income, monthly total expenditure, food expenses, age, education level, internet network, trust, suggestion, shopping experience on the internet, ease of use, awareness and cost. They found that monthly food expenses, sense of trust and education level of consumers are significantly important factors.

Armagan and Turan (2014) have examined the effects of socioeconomic factors on shopping over the internet. They used survey for data collection. Collected data were analyzed with SPSS program and also probit analyses were implemented. As a result of these analyses, significant relationship was found between shopping over the internet and income level, education level, frequency of internet usage, internet usage time, and

internet access at home. Reason of not to do shopping over the internet has been identified as security.

E-commerce is a new concept for Turkey. As it is seen in the literature, there is not much work about the factors affecting e-commerce in Turkey. Also, generally survey was used for collecting data in the studies which were made. In this study, macro data has been used. Variables which have been used are consumer price index, number of internet users, credit card usage and import. There are two variables which have not been used for explaining e-commerce in Turkey before. So, this study will contribute greatly to the existing literature.

Analyzing the Factors Affecting E-Commerce in Turkey with VAR Model

E-commerce transaction volume is increasing in Turkey constantly as in the world. In this part of the study, the factors affecting e-commerce in Turkey have been analyzed. Vector Autoregressive (VAR) Model which is popular recently has been used while analyzing.

Ways used to get results from the VAR models are as follows (Ozgen, Guloglu, 2004);

- F-tests showing the Granger causality
- Impulse response functions
- Variance decomposition showing the interaction between the variables.

In the first step, variables and the data set have been explained. Second, stationarity of the chosen variables has been tested with the help of unit root test. Third, granger causality test has been implemented. Fourth, lag lengths of the variables have been determined. Fifth, variables have been ordered. Sixth, Impulse Response Functions have been created and discussed. Finally, variance decomposition results have been discussed.

EViews 7.0 package program has been used in the analyses.

Data Set

Monthly data between January 2010 and December 2014 has been used in the analyses. The total number of observations is sixty. Variables included in the analysis are as follows;

E-commerce (ECOM) **:** Monthly e-commerce transaction volume

CPI (CPI) **:** Monthly consumer price index (2003=100)

Internet Users (IU) **:** Monthly total number of internet users

Import (IMP) **:** Monthly import volume

Credit Card Usage (CCU) **:** Monthly volume of credit card transactions

Also, as a result of Chow structural break test which is applied to the model, a structural break has been found in the eleventh month of 2012. Therefore, a dummy variable has been added to the model as an exogenous variable.

Firstly, the logarithm of all variables has been taken and then they have been subjected to the analyses.

Variable Characteristics

E-commerce: Variable of e-commerce has been used as dependent variable in the analyses. It identifies online domestic transactions with domestic and international cards in Turkey. Data for e-commerce variable has been taken from BKM website.

CPI: CPI identifies consumer price index (2003=100 based index). Data for CPI has been taken from Central Bank of Turkey database.

Import: Import variable which has been used in the analyses identifies total import volume of Turkey (million TL). Data for import has been taken from Central Bank of Turkey database. Recently, since a large part of the products which are sold through e-commerce are imported products, import variable has been added to the analyses.

Credit Card Usage: Credit Card Usage variable which has been used in this study refers total domestic transaction volume (million TL) which was made with domestic and international cards. According to Card Monitor 2014 published by BKM, the most preferred payment tool is credit card in online shopping in Turkey. Since payments in e-commerce transactions are generally made with credit card, credit card usage has been thought to affect e-commerce transaction volume. Therefore, it has been added to the analyses.

Internet Users: Variable of Internet users refers total number of internet users in Turkey. Data for internet users variable has been taken from IAB Turkey website. Since e-commerce transactions occur online via the internet, it has been thought to affect e-commerce transaction volume. So, it has been added to analyses.

Stationarity Test of the Variables with Unit Root Test

In time series, to be able to apply VAR model, all variables included in the model should be stationary. In this study, stationarity of the time series which are included in the model has been tested with unit root test. Whether the variables contain unit root has been tested with the Augmented Dickey Fuller (ADF) test.

Except import variable, all variables have been found as non-stationary. Therefore, their first differences have been taken and they have been tested again. As a result of these adjustments, all series included in the model has become stationary. So, hypothesis H_0 has been rejected for all variables at the significance level of 0.01. Table 3. shows the results of unit root test of the variables.

Table 3. Results of Unit Root Test

			T-STATISITCS	PROB*
ECOM	ADF test statistic		-7.361231	0.0000
	Test critical values	1%	-3.574446	
		5%	-2.923780	
		10%	-2.599925	
CPI	ADF test statistic		-6.456571	0.0000
	Test critical values	1%	-3.548208	
		5%	-2.912631	
		10%	-2.594027	
IU	ADF test statistic		-7.998689	0.0000
	Test critical values	1%	-3.552666	
		5%	-2.914517	
		10%	-2.595033	
IMP	ADF test statistic		-3.959617	0.0030
	Test critical values	1%	-3.546099	
		5%	-2.911730	
		10%	-2.593551	
CCU	ADF test statistic		-7.332211	0.0000
	Test critical values	1%	-3.574446	
		5%	-2.923780	
		10%	-2.599925	

Note: MacKinnon (1996) one-sided p-values.

Determination of Lag Length

After testing the stationarity of the variables, lag length selection has been made. The Optimum lag length is the minimum period which is determined by the maximum number of criteria. Table 4. shows the lag length of the series.

Table 4. Lag Length Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	557.9373	NA	1.06e-15	-20.29398	-19.92565	-20.15192
1	625.7796	118.0958	2.18e-16	-21.88073	-20.59157*	-21.38355
2	663.0234	57.93472	1.43e-16	-22.33420	-20.12422	-21.48190
3	697.9058	47.80182	1.06e-16	-22.70021	-19.56941	-21.49278
4	751.7828	63.85419*	4.20e-17*	-23.76973*	-19.71810	-22.20718*
4	751.7828	63.85419*	4.20e-17*	-23.76973*	-19.71810	-22.20718*

Note: Indicates lag order selected by the criterion

As it is seen in the table 4., optimum lag period has been found as 4.

Results of Granger Causality Test

Granger causality test has been applied to determine the relations between the variables. Table 5. shows the results of granger causality test which has been applied to the variables in the model.

Table 5. Results of Granger Causality Test

Sample: 2010M01 2014M12			
Lags: 4			
Null Hypothesis	Obs	F-Statistic	Prob.
CPI does not Granger Cause E-COMMERCE	55	9.25018	1.E-05
E-COMMERCE does not Granger Cause CPI		0.96807	0.4341
IU does not Granger Cause E-COMMERCE	54	3.40092	0.0163
E-COMMERCE does not Granger Cause IU		2.07418	0.1000
IMPORT does not Granger Cause E-COMMERCE	55	3.34417	0.0174
E-COMMERCE does not Granger Cause IMPORT		5.83542	0.0007
CCU does not Granger Cause E-COMMERCE	55	7.79837	7.E-05
E-COMMERCE does not Granger Cause CCU		6.53013	0.0003
IU does not Granger Cause CPI	54	0.67004	0.6162
CPI does not Granger Cause IU		1.13556	0.3519
IMPORT does not Granger Cause CPI	55	1.11767	0.3598
CPI does not Granger Cause IMPORT		1.82682	0.1399
CCU does not Granger Cause CPI	55	4.15348	0.0059
CPI does not Granger Cause CCU		2.83866	0.0347
IMPORT does not Granger Cause IU	54	0.92961	0.4553
IU does not Granger Cause IMPORT		0.38430	0.8187
CCU does not Granger Cause IU	54	0.69947	0.5964
IU does not Granger Cause CCU		0.47447	0.7542
CCU does not Granger Cause IMPORT	55	1.58590	0.1940
IMPORT does not Granger Cause CCU		2.09580	0.0967

According to Granger causality test results at 5% significance level;

There is unidirectional causality from CPI to ECOM $(CPI \rightarrow ECOM)$

There is unidirectional causality from IU to ECOM $(IU \rightarrow ECOM)$

There is bidirectional causality between IMP and ECOM $(IMP \Leftrightarrow ECOM)$

There is bidirectional causality between CCU and ECOM $(CCU \Leftrightarrow ECOM)$

There is bidirectional causality between CCU and CPI $(CCU \Leftrightarrow CPI)$

Ordering of the Variables

Ordering the variables is required in order to get the best results from the impulse response functions. In a VAR model variables should be ordered from exogenous to

endogenous. Ordering of variables can be done with the help of Granger Causality test. Variables' Ordering is as follows;

1. Credit card usage
2. Consumer price index
3. Import
4. Internet users

Results of Impulse Response Functions

With Granger causality, whether there is relationship between e-commerce and the variables included in the model has been tested. Then, with impulse response functions, the response of e-commerce to a standard deviation shock that can occur in the variables has been observed. Figures below show the response of Ecommerce to the other variables. Dashed lines show confidence intervals. Horizontal axis shows the number of months which pass after shock. Vertical axis shows the scale of response of e-commerce variable.

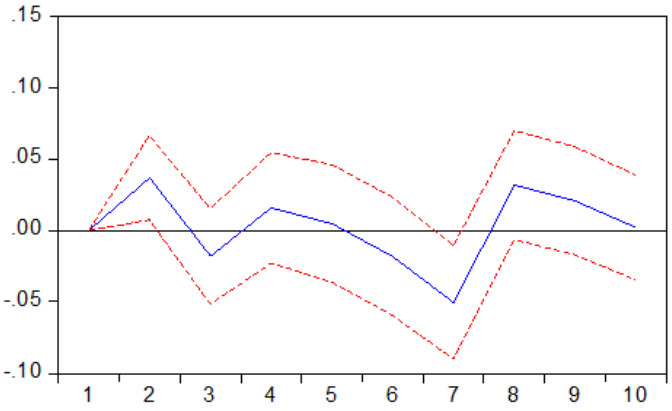

Figure 5 Response of E-Commerce to CCU

Figure 5 shows that the effect of credit card usage on e-commerce is positive beginning from the first period to the second period.

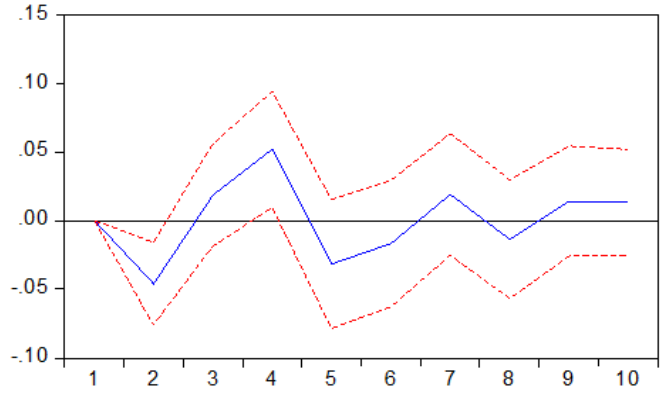

Figure 6 Response of E-Commerce to CPI

Figure 6 shows that the effect of Consumer Price Index (CPI) on e-commerce is negative beginning from the first period to the second period.

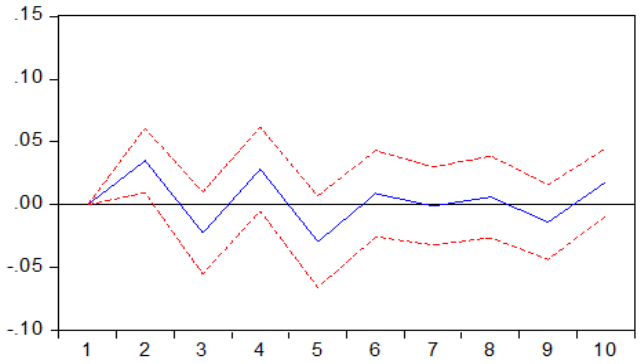

Figure 7 Response of E-Commerce to Import

Figure 7 shows that the effect of import on e-commerce is positive beginning from the first period to the second period.

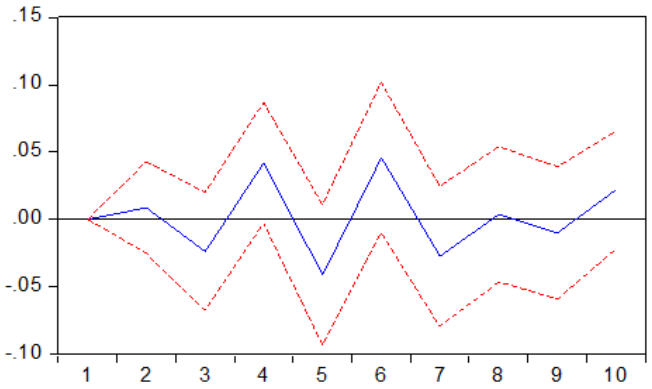

Figure 8 Response of E-Commerce to Internet Users

When we look at Figure 8, internet users variable has no significant effect on e-commerce.

Stability Test of VAR Model

After the model was set up, stationarity of the model has been tested. Figure 9 shows stationary test of VAR model. If there is one or more roots outside the unit circle, the model is called non-stationary.

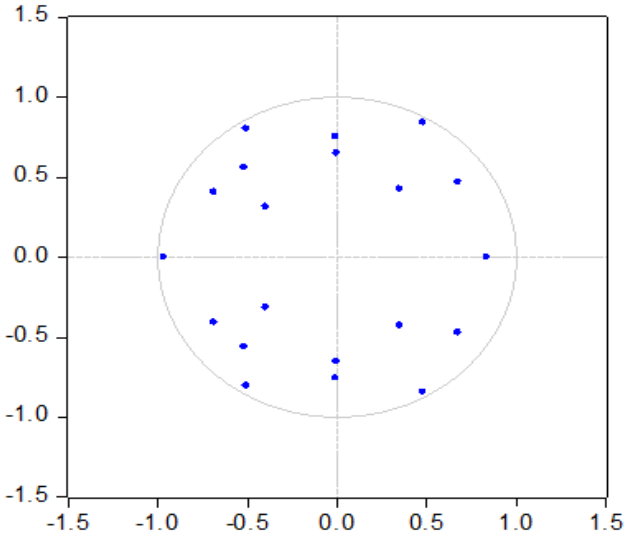

Figure 9 Stationarity Test of Var Model

In this model, since all the roots are in the circle, the model is stationary.

Autocorrelation Test of VAR Model

To determine whether the VAR model has a structural problem or not, serial Correlation LM Test has been used. Table 6 shows the autocorrelation test results.

Table 6 Results of VAR Residual Serial Correlation LM Tests

Lags	LM-Stat	Prob
1	34.48399	0.0980
2	34.40109	0.0996
3	27.86855	0.3139
4	24.48464	0.4915
5	15.83355	0.9197
6	28.13587	0.3016
7	29.56336	0.2411
8	36.12592	0.0697
9	24.41878	0.4953
10	25.24960	0.4485
11	19.42507	0.7763
12	19.95134	0.7494

The test results reveal that there is no autocorrelation between error terms for 12 lags.

Heteroskedasticity Test

To determine whether the model has heteroskedasticity problem White test has been used.

Table 7. Result of White Test

CHI-SQ	DF	PROB.
614.2448	615	0.5010

The test results show that variance of error term is the same for all observations and there is no heteroskedasticity in the model.

Results of Variance Decomposition

To understand how much of the change that occurs periodically in a dependent variable arises from its own past values and how much of it arises from other variables, variance decomposition has been used. Table 8 shows variance decomposition values.

Table 8. Variance Decomposition

PERIOD	S.E.	ECOM	CCU	CPI	IMP	IU
1	0.088480	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.120189	66.84679	9.367031	14.70729	8.549710	0.529184
3	0.129078	60.70373	10.09693	14.85371	10.45816	3.887472
4	0.148996	45.74680	8.708352	23.25981	11.43449	10.85055
5	0.160619	39.44582	7.575245	23.90566	13.20193	15.87135
6	0.169565	35.91654	7.988155	22.42428	12.11384	21.55719
7	0.180628	32.27511	14.87753	20.87670	10.67916	21.29151
8	0.186101	32.62523	16.90411	20.20319	10.16990	20.09757
9	0.189505	32.47308	17.47880	20.03545	10.34647	19.66620
10	0.193745	32.76965	16.73158	19.63658	10.75397	20.10822

In the second period, impulse or shock to e-commerce variable account for 66.85 per cent variation of the fluctuation in e-commerce (its own values), shock to credit card usage can cause 9.37 per cent fluctuation in e-commerce, shock to Consumer Price Index can cause 14.71 per cent fluctuation in e-commerce, shock to import can cause 8.55 per cent fluctuation in e-commerce and shock to internet users can cause 0.53 per cent fluctuation in e-commerce.

In the fifth period, impulse or shock to e-commerce variable account for 39.45 per cent variation of the fluctuation in e-commerce (its own values), shock to credit card usage can cause 7.58 per cent fluctuation in e-commerce, shock to Consumer Price Index can cause 23.91 per cent fluctuation in e-commerce, shock to import can cause 13.20 per cent fluctuation in e-commerce and shock to internet users can cause 15.87 per cent fluctuation in e-commerce.

In the tenth period, impulse or shock to e-commerce variable account for 32.77 per cent variation of the fluctuation in e-commerce (its own values), shock to credit card usage can cause 16.73 per cent fluctuation in e-commerce, shock to Consumer Price Index can cause 19.64 per cent fluctuation in e-commerce, shock to import can cause 10.75 per cent fluctuation in e-commerce and shock to internet users can cause 20.11 per cent fluctuation in e-commerce.

Conclusion

This study has been conducted to explore the factors affecting e-commerce in Turkey. Firstly, general information about e-commerce has been given. Secondly, the studies about factors affecting e-commerce have been analyzed. Finally, the analysis of the factors affecting e-commerce in Turkey has been made.

As a result of all analyses, the considerable effects of consumer price index, credit card usage and import on e-commerce have been observed. While the effects of import and credit card usage on e-commerce are positive, the effect of consumer price index on e-commerce is negative. According to the analysis, unlike literature, significant relationship couldn't be found between e-commerce and internet users variable statistically.

The positive impact of the import on e-commerce volume of Turkey is an expected result. Because, the goods which are the subject of e-commerce are generally imported goods. Therefore, when the import increases in Turkey, e-commerce volume also increases.

The positive impact of the credit card usage on e-commerce volume of Turkey is also an expected result. Because, the most preferred payment tool of e-commerce is credit card in Turkey. According to Card Monitor 2014 report published by BKM, share of credit card is 84 per cent between the other payment tools. So, when the credit card usage increases in Turkey, e-commerce volume also increases.

The other expected result was that consumer price index to have negative impact on e-commerce volume of Turkey. Because when the general level of price increases, the purchasing power of consumers reduces. So, it is normal the consumer price index to have negative impact on e-commerce volume.

Lastly, the internet variable to be insignificant was not an expected result. In the literature, internet was generally found as a significant variable for e-commerce volume. But, this dissertation's findings show that internet users variable does not have a significant effect on e-commerce volume of Turkey. It may be due to the fact that every internet user may not make purchases over the Internet. In Turkey, most of the internet population consists of young internet users. According to TUIK, the highest rate of computer and internet usage in Turkey is in the age group of 16-24 and purchasing power of this age group is low. People aged 16-20 are generally students in formal education and have a limited budget. And, unfortunately, the youth unemployment rate is 30 per cent for the 20-24 age group in Turkey. So they may not make purchase over the internet. Therefore, the internet users variable may not have an effect on e-commerce transaction volume of Turkey.

Contributions, Limitations and Suggestions

This study consists of the variables of import and credit card usage which were not used in the previous studies. So, it will contribute the future works in this area. Besides, it has been considered that the level of education and per capita GDP are the factors which may affect e-commerce. But, the monthly data has been used in this study since e-

commerce is a new concept for Turkey. So, it is hard to access the data for these variables. Analyses can be conducted by using these data in the future studies if they can be published.

E-commerce which began to be used for the first time in the early 1990s in the world met with Turkish market in 1998. Especially since 2008, Turkey has entered a rapid growth and development trend. Since then, e-commerce market in Turkey has shown an average growth rate of 35 per cent per year. According to the data published by BKM, e-commerce volume which was 25 billion TL in 2012, reached 41 billion in 2014. Although e-commerce is a new phenomenon in Turkey, it is developing day by day with the inclusion of new participants into the market. Moreover, e-commerce volume in Turkey is expected to exceed 60 billion in 2017.

Despite this rapid development, retail sales rate of e-commerce in Turkey appears to be quite low compared with other developing countries. While the share of the online retail in total retail is 1.3 per cent in Turkey in 2013, this value is an average of 5.5 per cent in developed countries and 3.5 per cent in developing countries. Moreover, when Turkey is compared with Poland which has 5.3 per cent rate in online retail, Turkey seems to follow e-commerce from the back. It can be said that the underlying causes of this condition are security, problems encountered in payment, perception problem, technological, legal and financial infrastructure problems.

The number of credit cards in use 56 million and the number of internet users is 36 million in Turkey. Turkey also has a young population and strong logistics infrastructure. In the light of this information, Turkey's e-commerce potential appears to be quite high. Turkey performs behind the existing potential because of the reasons expressed above. It can be said that important tasks fall especially to the public for overcoming this situation, as e-commerce has entered into a wide area of responsibility such as transport, science, industry, finance, trade and education. Therefore, to contribute to the sector and to overcome the existing obstacles is possible with the coordinated work of the public and relevant ministries.

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