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# The Effect of E-Taxation System on Tax Revenues and Costs in Turkey

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## Abstract

This paper examines the effect of electronic taxation system on tax revenues and tax collection cost. In this study, the effect of tax revenues on Gross Domestic Product (GDP), budget revenues, and the effect of expense amount made for tax revenue collected was selected as variables. Data used in the study came from the Republic of Turkey. The data comprises two groups of the tax period, namely: pre-electronic tax period of 1993-2004 and post-electronic tax period of 2005-2016. A non-parametric statistical analysis tool - Mann-Whitney U Test was adopted in the study. In this study, relevant information has been given about electronic transformation of the taxation system and Turkish taxation system. Based on the empirical results of the study, the transition to electronic taxation system affects tax revenues positively and also causes tax collection cost negatively.

**Keywords:** E-taxation system, tax revenue, Turkey, Mann-Whitney U Test.

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## 1. INTRODUCTION

In today's world where globalization is rapidly experienced, information and communication technology are progressing at an unprecedented pace. Information communication technologies (ICT) have emerged as a value enabling managers to quickly, rapidly, and more cheaply store data and presenting opportunities that facilitate its transportation. Development of ICT applications for business use has changed the functions, products as well as services of businesses (Monica et al., 2017). The widespread use of ICT in the various sectors brings new opportunities for economic growth (Chatama, 2013). In a globalizing world, one of the most important changes and developments in computer and, thus, "e-transformation" expressing transformation into Internet virtual world. Almost every process such as data exchanges, communication, among others is performed through Internet virtual world. In the centre of the transformation process, which emerged after the industrial revolution, has modified the economic and social structure and lead to the development of information and communication technologies.

The political, economic, social, and technological developments experienced in the present time and intensity of competition in the markets, together with globalization made the restructuring of the public, and private sector unavoidable from an institutional point of view. As a result of this transformation, with the aims of making government agencies and organizations proactive, extending and improving information flow between government and citizen, developing democracy, and making government more transparent, the idea to deliver public services electronically has emerged (Uğur & Çütçü, 2009). The government may be using information and communication technologies to provide and develop governmental services such as the processes and interactions with the citizens, businesses, or other governmental branches (Seelmann et al., 2011). One of the areas, in which e-government applications are gradually employed widespread and make itself felt is successfully used, is taxes (Gerçek, 2010). Tax is a source that finances government expenses. Additionally, the tax is one of revenue

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instruments that make an essential contribution to social welfare. Hence, collecting tax accurately and timely have been one of leading missions of governments.

Turkey knew beans about e-transformation current the developing technologies caused and, developing projects to transfer most of the public services to electronic media, took steps for e- transformation. The pioneer of these projects has been to transfer tax system to the electronic environment. Filling tax returns electronically and collecting significant part of tax revenues in electronic environment accelerated the transition of taxation system in Turkey to the electronic media. Integration of these two systems produced a new perspective for tax administration system in Turkey and formed an excellent example of using modern technologies in tax administration and modernization of tax administration structure (Turan & Özgen, 2009).

In this study, after the shift to electronic taxation system in Turkey, which was aimed at presenting effect on a variation on tax revenues. In the direction of this aim, electronic taxation system is conceptually examined, later, taxation system in Turkey and transition to electronic taxation system was reported and, finally, the analysis of this study discussed.

## **2. E-TAXATION SYSTEM**

Developments in information and communication technologies and, especially the Internet, provide the new opportunities in storing, processing, transmitting, integrating, and using the information (DPT, 2005). Integration of computer and internet ensures private and public services to be given in non-physical virtual environment, prepares the ground for the emergence of electronic services (e-service). In this framework, e-services were first used for developing trade by the business world. Following and beginning from the mid-1980s, public administration of developed countries began to utilize this system in the presentation of public services (Demirhan & Türkoğlu, 2014).

Transition to electronic life has managed to be one of an essential transformation modifying the interaction between business, government, and citizens. The electronic taxation system is one of the concepts that emerged with the interaction between business, government, and citizens (Allahverdi & Kuzucu, 2017). Making taxation electronic is a process coming to our face to collect, assess, and become automated information related to tax for increasing effectiveness (Fu et al., 2006). Its history began in 1986 as a small test program in which only 5 taxpayers from Cincinnati, Raleigh Durham, and Phoenix agreed to participate. Since then, the electronic tax system has grown to become commonplace, serving millions of taxpayers every year (Maisiba & Atambo, 2016).

E-taxation is an e-government application providing the realization and collection of taxes. About automation of tax offices, developments in information and communication technologies have availed. With these developments, taxpayers can submit their tax returns through electronic media. Thus, they could make their realization and collection processes related to the tax returns using a computer; and that they could gather the information about the income, welfare, and expenditure through electronic media; moreover, that tax supervision was computer-aided (Çetin, 2010).

Electronic taxation system presents training and information about the electronic record, filing, and payment to taxpayers. In general, the e-taxation system is a comprehensive internet portal, which forms a reliable option of self-service for taxpayers. It thus can provide a single point of the information and actions and can be accessed 7 days a week and 24 hours, a day, and it does not require the staff of tax office to intervene (Jimenez et al., 2013). While describing electronic taxes, online filing and tax returns are assessed, which enable taxes to be paid electronically, share the information about tax evaluations between the different government departments, and are web-based portals to train taxpayers about taxes. Nowadays, services about taxing are among the most advanced e-government services in the world. Also, e-taxation services are taxation services, which are used in most countries, and sometimes forced by its customers (Dečman & Klun, 2015).

## **3. TAX SYSTEM IN TURKEY AND TRANSITION TO E-TAXATION SYSTEM**

In order to meet public needs, public services, which can be realized by the government, require finding financial resources regularly. An essential part of the resources concerned is supplied by taxes, in other words, taxes are vital financing instrument of government. Tax, besides the fact that it is an important financing instrument to the government to perform its statutory functions through the provision of infrastructure and facilities, represents an important instrument in realizing socio-economic objectives such as arranging income distribution and providing economic stability (KOTO, 2017).

Government, which has authority to levy, uses a legal and actual force due to sovereignty rights it has. State of Turkish Republic embodied this authority force with Item 73 of its constitution. With the provision that “Everybody is obliged to pay tax according to his or her financial abilities to meet public expenditures”, this item stated that every Turkish citizen must become taxpayer according to their financial abilities (Hayran, 2013).

In Turkish Taxation System, the tax is received through three subjects as income, wealth, and expenditure. Two kinds of taxes are received through income as Income Tax and Corporation Tax; and three kinds of taxes through wealth as Real Property Tax, Motor Vehicle Tax, Inheritance Tax. In Turkish Taxation System, the leading tax received through expenditures is Value Added Tax (VAT) (Atsan & Mezararkali, 2012). A large part of tax revenues obtained in Turkey consists of Income Tax, Corporation Tax, and Value Added Tax. In Table 1, in tax revenues obtained in the last 15 years, the shares of Income Tax, Corporation Tax, and Value Added Tax are shown. It is seen that tax revenues obtained from three taxes concerned form a large part of total taxes (Gürdal et al., 2016).

Table 1. Income tax, corporation tax and value added tax revenues share of total tax revenues (2002-2016)

Years	Income tax (%)	Corporation tax (%)	Value-added tax (%)	Total (%)
2002	23,00	9,35	34,21	66,56
2003	20,24	10,25	32,06	62,55
2004	19,49	9,52	33,97	62,98
2005	20,35	10,29	32,03	62,67
2006	20,97	8,23	33,53	62,73
2007	22,25	9,19	32,41	63,85
2008	23,39	9,82	31,62	64,82
2009	23,44	10,55	30,65	64,64
2010	20,95	9,70	32,09	62,74
2011	21,05	10,28	33,59	64,91
2012	21,96	10,12	32,52	64,61
2013	21,42	8,55	33,71	63,68
2014	22,67	8,75	32,50	63,92
2015	22,65	7,96	33,07	63,68
2016	23,37	8,86	31,85	64,08

Source: [http://www.gib.gov.tr/sites/default/files/fileadmin/user\\_upload/VI/CVI/Tablo\\_67.xls.htm](http://www.gib.gov.tr/sites/default/files/fileadmin/user_upload/VI/CVI/Tablo_67.xls.htm)

As in around the world, also in Turkey, public institutes and organizations, gradually more utilizing information and communication technologies, develop projects and applications to strengthen their decision support units, accelerate business processes, increases efficiency, and be able to provide saving in their expenditures (DPT, 2005). The adoption of technology that makes all processes of tax offices automated brings about a reduction in the workload, increased efficiency and effectiveness in the works of tax offices, and formed a healthy decision support and managerial information system. Report from the information collected in computer media set tax authorities in Turkey into motion and hence the attempt at integrating tax into technology (Gerçek, 2010). In order to form a channel to reply the information need of everybody that is part of tax subject, first of all, in 1999, Internet Tax Office was formed called [www.gib.gov.tr](http://www.gib.gov.tr) (GİB, 2011).

E-taxation application in Turkey reached the most substantial ground with the projects called Vedop-1 and Vedop-2. With Vedop-1, it was targeted to monitor the processes of all Tax Offices through computer media. In respect of April 2004, in 22 cities and 155 Tax Offices, it was carried into action and application was become widespread every passing day. For enabling citizens to be able to do their transactions related to tax in electronic medium via Vedap-2, the sub-applications objectives are to (a) increase the numbers of automated tax offices, (b) receive tax returns (e-returns) through Internet, (c) establish, supervise, make automated internet tax office (e-tax office), and form data storage were completed (GİB, 2017). As a result of VEDOP, several concepts that emerge such as e-tax return, e-invoice, e-supervision, e-collection, e-seizure, e-ledger, re-record, and e-document have begun to take place in Turkish Tax System (Öz & Bozdoğan, 2012).

#### 4. RESEARCH MODEL

In the study, based on the year 2005, when electronic tax return system is passed, two periods were formed. In the periods, it was paid attention to that the numbers of the year have to be equal. According to this, while the first period consists of the data between the years of 1993-2004 covering 12 years forming pre-electronic taxation system, and the second period, the data between the years of 2005-2016 covering 12 years forming post-electronic taxation system. Thus, in the study, the data covering 24 years were analyzed. In both periods, the rate of tax revenues/GDP, the rate of tax revenues/budget revenues, expenditure per tax of TRY 100, and the rate of tax flexibility were used as a variable. The data of the study were drawn from the website of Turkish Presidency of Revenue Administration (<http://www.gib.gov.tr>).

The study aims to study whether or not there is a difference between the variables of two periods. In the direction of this aim, and the hypotheses of the study were thus formulated:

Hypothesis 1: Between two periods, the rate of tax revenues/GDP is different.

Hypothesis 2: Between two periods, the rate of tax revenues/budget revenues is different.

Hypothesis 3: Between two periods, expenditure per tax of TRY 100 is different.

In the study, since the sample size is small ( $n = 24$ ), in order to test whether or not there is a difference between the periods, a non-parametric statistical analysis tool was preferred. In the study, for the test of hypotheses, Mann-Whitney U Test was used. This test is used for analyzing the differences between two independent groups (Kalaycı, 2016). In statistical calculations, the significant level was taken as 5%. The findings revealed the effect of electronic taxation system as positively significant, and hence, adopted in the study.

## 5. DATA ANALYSIS AND FINDINGS

For data analysis, SPSS IBM version 21 was utilized. First of all, the data were keyed into the program, and Mann-Whitney U Test was adopted for the hypotheses testing. The results of the analyses are shown in Table 2, Descriptive statistics for periods.

Table 2. Descriptive statistics for periods

Descriptive Statistics						
Group		N	Mean	Std. Deviation	Minimum	Maximum
Before	TG	12	,1380	,02869	,10	,18
	TB	12	,8047	,02969	,75	,86
	Cost	12	1,6167	,69757	,79	3,02
After	TG	12	,1985	,00483	,19	,20
	TB	12	,8649	,02104	,83	,89
	Cost	12	,6783	,10044	,53	,82

In the study, 2 periods were used and the first period that was the pre-electronic taxation system was called “before” and the second period that was post-electronic taxation system, “after”. Both periods also have 12 observations. According to Table 2, in the first period, the mean value of tax revenue/GDP (TG) is 0.1380 (SD=0.02869), that of the rate of Tax revenue/Budget revenue (TB) is 0.8047 (SD=0.02969), and that of Cost is 1.6167 (SD=0.69757). When we regard to the second period, the mean value of Tax revenue/GDP is 0.1985 (SD=0.00483), that of the rate of Tax revenue/Budget revenue is 0.8649 (SD=0.02104), and that of Cost is 1.6783 (SD=0.10044). As will be understood from the data of Table 2, the data of the second period, i.e. macroeconomic indicators after passing to electronic tax system exhibited better mean value compared to the previous period.

Table 3. Mann-Whitney U Test ranking results

Ranks				
	Group	N	Mean Rank	Sum of Ranks
TG	Before	12	6,50	78,00
	After	12	18,50	222,00
	Total	24		
TB	Before	12	7,08	85,00
	After	12	17,92	215,00
	Total	24		
Cost	Before	12	18,25	219,00
	After	12	6,75	81,00
	Total	24		

Table 4. Mann-Whitney U Test results

Test Statistics <sup>a</sup>			
	TG	TB	Cost
Mann-Whitney U	,000	7,000	3,000
Wilcoxon W	78,000	85,000	81,000
Z	-4,157	-3,753	-3,988
Asymp. Sig. (2-tailed)	,000	,000	,000
Exact Sig. [2*(1-tailed Sig.)]	,000 <sup>b</sup>	,000 <sup>b</sup>	,000 <sup>b</sup>
a. Grouping Variable: Group			
b. Not corrected for ties.			

In the study carried out, according to Table 4, a significant level of the rate of tax revenues to GDP turned out 0.000 (Asymp. Sig. (2-tailed): 0.000). Since this value is smaller than 0.05 that is expected significant level, Hypothesis 1 was accepted. According to this, the rate of tax revenues/GDP between two periods significantly

differentiates. When we look at Table 3 for this differentiation, the effect of tax revenues on GDP forming after passing to electronic tax return system was more effective than that of pre-electronic taxation system (After; Sum of Ranks: 222).

A significance level of the rate of tax revenues to budget revenues turned out 0.000 (Asymp. Sig. (2-tailed): 0.000) again according to Table 4. Since this value is smaller than 0.05, that is, expected significant level, Hypothesis 2 was accepted. According to this, the rate of tax revenues/budget revenues between two periods significantly differentiates. According to Table 3, after passing through electronic tax return system, the effect of tax revenues that formed on budget revenues was more effective than that of pre-electronic taxation system (After; Sum of Ranks: 215).

Finally, in the test of Hypothesis 3 formed for the variable that is related to tax collection cost, significant level turned out 0.000 (Asymp. Sig. (2-tailed): 0.000) according to Table 4 Since this value is smaller than 0.05 that is expected significant level, Hypothesis 3 was accepted. According to Table 3, the cost that is endured for a tax of TRY 100 was more costly in pre-electronic taxation system (Before; Sum of Ranks: 219).

## 6. CONCLUSION

Taxes constitute an essential revenue resource of government in financing public expenses made to meet socio-economic needs and intervene in socioeconomic life (Mucuk & Alptekin, 2008). In this study, the concept of electronic taxation system emerging upon that tax, an important income resource, is affected by the last technology, was studied together with the sample of Turkey. In the study, that taxation system in Turkey was made electronic has been reported and the effect this new taxation system created has been examined regarding the effect of tax revenue on GDP, the effect of tax revenues on budget revenues, and tax collection cost. According to this, in Turkey, after passing to the electronic taxation system, the rate of tax revenues to GDP differentiated in the direction of increase of 43,84%. In the same way, the share of tax revenues in budget differentiated in the direction of increase of 7,48% after passing to the electronic taxation system. Finally, the rate of tax collection cost for tax revenue of TRY 100 decreases by 58,04%. All results obtained revealed that electronic taxation system had a positive effect on tax revenues and costs.

The limitation of the study is a scarcity of the data obtained because electronic taxation system in Turkey is new. Hence, in the future studies, increasing data or examining the data from monthly periods instead of annual data will be in place. In addition, examining electronic taxation system from the aspect of sorts of taxes and also including the other macroeconomic indicators in the variables will be appropriate for the future studies.

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