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Estimating the Tax Capacity of E-Commerce Sector: Evidence from Iran's Data

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ABSTRACT

One of the new business activities which has emerged in recent years is the creation and development of e-commerce. With the spread of e-commerce, there is the possibility of tax evasion in new revenues that were traditionally collected before. On the other hand, tax capacity is the economic capacity of a country to withstand the pressure of various taxes. In other words, it is the amount that people can pay in taxes. Determining tax capacity is a difficult and important task. In this regard, a precise estimate of tax capacity and finding its available resources seem necessary. Therefore, given the importance of this issue, the present study first tries to investigate the tax capacity, tax collection from e-commerce sector, and then it intends to estimate the tax capacity of the e-commerce sector as a regime in Iran. In this study, the tax capacity of e-commerce in Iran during the period 1973-2013 has been estimated. The results of this study showed that the total tax capacity follows a three-regime behavior. In all three regimes, the independent variables had a significant effect on the total tax capacity, but the size of these coefficients was different in each of the regimes and even in some cases it was different for the effect. Based on the results, it can be stated that the degree of impact and the direction of the impact of the fundamental variables of total tax capacity on tax capacity varies depending on economic conditions.

Keywords: Tax Capacity, E-Commerce, E-Commerce Tax Capacity, MIMIC

1. Introduction

The development of information and communication technology has affected various areas of human life. The application of this technology in economics along with the phenomenon of globalization, has introduced a new concept called new economy or digital economy, which is one of the main and real manifestations of the new economy, e-commerce (Turban et al., 2006). The genesis of telecommunication technologies, such as telecommunication technologies of companies, enable companies, individuals, and organizations to engage in e-business, providing opportunities for resources and skills that cannot be accessed by individuals alone through external sources, and by definition, e-business is a business that provides many opportunities and benefits to companies, governments and consumers (Fane, 2003). E-business includes the functions of information technology and communication in all business processes such as office automation, financial exchanges, production processes, coordination with other factories, managing relationships with the customers, managing supply chain and distribution network management (Lal, 2005). In fact, this new way of doing business affects economic systems both domestically and locally, as well as internationally. The fact is that in e-commerce, sellers of goods may be physically located in only one place but sell goods and services all over the world. In this case, even though there are hundreds of points of sale for a firm, there will be only one place to pay taxes. Some experts believe that in this way the number of tax-paying places is much less compared to the number of places of sale and as a result the government's tax revenue is very low compared to the volume of e-commerce (Mahmoudzadeh & Hassanzadeh, 2006).

E-commerce has also made it difficult or impossible for taxpayers to view information and enforce taxes. Taxpayers may disappear in cyberspace and no one knows where they are. Even when the online business position of an online businessman is determined, taxing it will be difficult because the time and place of the transaction is unknown. Also using connected servers is among the various tax breakers, and changing the signals from one server to another to keep network traffic balanced. Determining which server is used for which activity at a time is difficult and adds to the complexity. In addition, even if we can associate a particular domain name with a particular person or computer, all three may be located in different countries (McLoreh, 2002).

Also, taxes, as a part of government revenues, play an important role in the economy of any country. Awareness of tax revenue collection plays an important role in predicting government budget and future plans for its distribution and consumption. Today, the role of tax systems in any country in securing revenues from the collection of tax resources is not hidden from anyone. The increasing progress of science and the use of new communication and information tools have made the need for computers and the Internet a necessity. The evolution of tax assessment in the developed countries of the world shows a significant reduction in the use of traditional tools for tax assessment and the use of electronic taxation. Since the implementation of e-commerce projects in the country is one of the main goals of e-government, issues such as the "electronic" tax system from the beginning were of special importance in the country and a lot of investment was made on it. Today, one of the most obvious signs of e-government in developed countries is the interaction of citizens with the government in tax systems (Kabiri et al., 2017).

In addition, tax evasion and tax fraud are two phenomena that probably date back to the taxation phenomenon itself. Whenever and wherever the rulers decided to impose taxes, individuals and businesses sought to evade or avoid paying them. This phenomenon is expanding in the present age, which is also known as the digital age, and the opportunities of these units have increased and at the same time the possibility of identifying them has become more difficult. There are many different reasons for tax evasion that have been theoretically and empirically analyzed. Accordingly, studies related to tax evasion can be divided into three parts: effective factors (Marley & Martina, 1988; Dan, 1992; Johansen & Kaufman, 2000; Fisman et al., 2001; Levin and Weidel, 2007; Kai and Liu, 2009; Fagbami et al., 2010; Nagy, 2011; Wang, 2012; Khanjan, 2006; Mousavi Jahromi et al., 2009; Jafari Samimi and Hamzaei, 2009; And Zehi and Mohammad Khanli, 2010, (works) Azizkhani & Afshari, 2007; And Seyed Nourani, 2009) and calculating its amount (Ingestrom & Holmond, 2006; Sadeghi and Shakibaei, 2009; And Milani and Akbarpour Roshan, 2012 (categorized) Samadi and Tabandeh, (2013). On the other hand, tax revenue is the most important source of government

revenue in many countries and in Iran, after oil revenues, the largest share in financing E-commerce with high rates are rising worldwide. Studies show that the volume of e-commerce in Iran in the first half of 1999 reached 639 thousand billion tomans. According to the report of the first half of the e-commerce development center, this figure has increased by about 284% compared to the first six months of 1998. Of these statistics, more than 447 thousand billion tomans are related to purchases through the Internet portal and more than 191 thousand billion tomans are related to on-site payment methods. Given such a growth in e-commerce, it seems important to address the issue of e-commerce tax. The purpose of this paper is to estimate the tax evasion of e-commerce on a regime basis. Tax evasion of individuals and businesses is the most important obstacle in increasing the level of tax revenues relative to the total tax capacity of the country. There are no official statistics on tax evasion. But a more important issue is that taxes in Iran and other countries are levied due to the creation of security in society, etc., and direct tax is one of the taxes that is also levied on business owners, and e-businesses should do this. Pay the type of tax, but how it is calculated is based on parameters that are different from traditional businesses due to different operating space. On the other hand, tax exemptions are provided in countries around the world for macro policies such as the growth of regions or some specific industries, and in Iran, the major tax incentives are tax exemptions, which are also considered for e-businesses and knowledge-based (Electronic Commerce Development Center of the Ministry of Samt, 2019).

On the other hand, tax capacity provides the necessary information about the country's economic ability to equip tax resources to respond to financial problems and implement economic policies. One of the most important requirements on which the present study is based is the estimation of the tax capacity of the country's e-commerce sector and appropriate measures to increase tax receipts. Traditional or offline is different; For example, due to economic sanctions, different costs are paid for the purchase of servers or the use of different certificates and advertisements in Google, which has caused virtual businesses to have different costs than traditional businesses; On the other hand, in e-businesses, new technologies and education must be used constantly, while the tax administration of these cases rejects and does not accept these costs. On the other hand, the awareness of managers and government officials, especially in the tax sector, is the most important issue for virtual businesses. According to the E-Commerce Development Center, tax evasion in virtual businesses is lower than in other businesses because they operate quite transparently and there is the ability to monitor this category of businesses (E-Commerce Development Center of the Ministry of Samt, 2019).

2. Theoretical Foundations

2.1. Tax Capacity

Musgrave and Musgrave (1993) believe that the need of any government for financial resources to perform duties and responsibilities such as securing and protecting borders, providing goods and public services, positive and negative consequences, and economic stabilization. In this regard, taxation is the most important way of financing since the beginning of the formation of societies and governments. It is also responsible for economic stabilization, reducing economic fluctuations, directing activities, and redistributing income, so it is important to estimate tax capacity to understand the general state of tax behavior and to determine how tax revenues increase. The concept of tax capacity is inferred, the amount of potential tax that a country or region, given the tax base and monetary volume of economic activities, the possibility of receiving it in each period of a country or region does not reflect the tax base, but due to the lack of a more appropriate alternative criterion, GDP as the main basis of finance is used in a country or region (Hajati et al., 2019).

Tax capacity is the amount of tax that society can pay, and this power relies on revenues, expenditures and investments on the one hand, and on long-term goals and short-term and medium-term planning on the other hand. When it is stated that the tax capacity of the country is equal to Rials, this capacity is necessarily due to the optimal tax threshold that has been set and that is why the optimal tax threshold and tax capacity are abbreviated as equivalent terms. The efficiency of the tax system can be carefully examined and commented on when the tax capacity of the society is accurately estimated and then the estimated tax capacity is compared with the taxes collected.

Economists often use the tax-to-GDP ratio to assess tax performance. In fact, the projected tax ratio shows the average tax performance, which is considered as tax capacity. According to another definition, tax capacity is the economic capacity of a country to withstand the pressure of various taxes; In other words, the amount that people can pay in taxes. There are several definitions of tax capacity, but in general it can be said that tax capacity is the maximum tax that can be collected in the long run depending on the level of income distribution, composition and existing laws of each country. Determining tax capacity is a difficult task. The most important means of measuring tax capacity is the per capita income of a country. On the other hand, tax capacity or tax ratio (tax-to-GDP ratio) is an indicator for comparing the tax performance of countries. Various human, economic, political and legal issues should be evaluated (Falahati et al., 2010).

In other words, the tax capacity of any country provides the necessary information about the economic power of that country in equipping tax resources so that the country's officials can solve financial problems and also implement appropriate economic measures and policies. Another definition of tax capacity is the amount of potential tax that is possible for any country to acquire it, according to different income bases and economic activities. In any economy, tax capacity is a function of influencing factors and is calculated based on it. Whereas, in contrast to potential taxes, there is an actual tax whose tax collection is different from the actual tax to be levied. In other words, there are actual taxes and tax receipts (Rabiee & Ismail Nia Ketabi, 2013).

2.2. Taxation of E-Commerce

Udomvitid (2003) states that governments and international organizations, such as the Organization for Economic Co-operation and Development (OECD), generally believe that e-commerce should be taxed in accordance with the standard principles governing traditional taxation. In 2000, it issued a report outlining the requirements for implementing an e-commerce tax framework, in fact, the same taxation principles that guide governments in traditional commerce should be used to guide e-commerce. These principles try to enjoy a taxation system under the technology of the existing software and at the same time they should not hinder the advancement of information technology and the development of e-commerce. Although governments are concerned about the erosion of e-commerce taxes, so far no e-commerce tax has been universally enforced in any country. This is because preventing the loss of tax revenue from e-commerce cannot be a sufficient reason for a new e-commerce government to add e-commerce to its tax system. Research shows that the loss of e-commerce tax revenue is currently very small and there is no need to impose a new e-commerce tax on e-businesses. Another issue is tax evasion. The difference between tax evasion and tax fraud is that the former is legal while the latter is illegal. Measuring tax evasion is difficult because people hide it or do not report it to the tax authorities because they have made illicit income from illegal businesses such as selling drugs or prostitution. Another reason to hide income is that hiding some from economic activities such as renting a house is easy for tax collectors. Accordingly, Schneider and Enste (2000) consider taxes as one of the most important factors in the growth of the shadow economy. According to them, taxes affect the choice of leisure and labor supply in the shadow economy or the part of the economy that is not taxed; Because the greater the difference between the firm's cost to the formal labor force in the shadow sector (more tax is levied) or the firm paying more for social security, the more incentive both the firm and the labor force the shadow sector will have (Abu Nouri & Nikpour, 2014).

Also, studies show that the most important benefits and costs of imposing or not imposing a tax on e-commerce are related to issues such as loss of government tax revenue, competition with retailers, foreign works, distribution effects and executive costs (Mahmoudzadeh & Hasanzadeh, 2009). In fact, there are several primary arguments for imposing a sales tax on Internet transactions. Proponents of a sales tax on Internet transactions argue that lobbying organizations and political intermediaries prevent legislators from imposing a sales tax on trade. They see the imposition of sales tax on e-commerce as the preferred cure for the economy, saying such schemes lead consumers to choose e-commerce over traditional forms of commerce. Such a tax widens the digital divide, they argue.

They say the only way for the economy to thrive is to have the same tax on e-commerce and other things. The next point is that some argue that these sites need

support to survive, but taxpayers argue that yes, small online retailers need support to survive, but giants like Amazon, eBay and Orastock make up a significant portion of consumer purchases. They carry the burden. As a result, there is no need to protect such companies with tax breaks for their better growth. Finally, they argue that taxes levied on Internet sites can be an important source of revenue for the government treasury. They argue that given the growing state of e-commerce, the inability of states to raise taxes on consumer purchases will have serious negative economic consequences. But in the meantime, some are opposed to tax collection in this regard. People who oppose the collection of sales tax by online retailers consider the tax on e-commerce to be unconstitutional and unfair. The first argument they make is that the sales tax levied on e-commerce leads to job losses and damage to small businesses. For example, many Amazon affiliate groups were small businesses that Amazon cut off from because of state laws and had a negative impact on their business. Another argument is that since the Supreme Court's jurisprudence is such that governments and states cannot tax retailers unless there is a significant relationship between that retailer and the state, and because there is no such link between the online retailer and the tax-paying state, the law that imposes a tax on Internet transactions violates the commercial clause of the Constitution, as we have mentioned that the trade clause refers to Section 8 of the Constitution, which gives the Congress the power to regulate trade with foreign countries and between different states. Their next argument is that imposing a tax on e-commerce is unfair because today Internet retailers need more support to stay competitive and grow in the market. Opponents often base their arguments on supporting these small businesses. For example, they point out that more than 17,000 small businesses in California have written letters to lawmakers opposing tax collection and imposition on online retailers. These small businesses were primarily opposed to tax collection because many of these businesses made money by placing ads outside their state on their websites, while the bill stated that if anyone advertised on California websites and there is a link to it in California. That business must pay taxes on all the income it has received in this regard (Ranjbar et al., 2016).

The e-Commerce Development Center of the Ministry of Samt (2019) has also stated that the awareness of managers and government officials, especially in the tax sector, is the most important issue in virtual businesses. According to the E-Commerce Development Center, tax evasion in virtual businesses is lower than in other businesses because they operate in a completely transparent manner and these businesses can be monitored; The e-commerce development center of the Ministry of Samt has emphasized that it is ready to cooperate to solve the tax challenges of e-businesses; These businesses must pay taxes like other businesses, but their tax model must be appropriate so as not to infringe on the rights of virtual businesses. The most important tax challenges for e-businesses in Iran are as follows:

1) Non-acceptance of foreign documents in the tax office, including server cost factor (hosts)
2) Lack of proper understanding of the complexity and development of e-business models by the tax administration
3) Failure to receive and accept part of the electronic documents by the tax office
4) Collection of taxes based on licenses by the tax office
5) Lack of tax branches for investigating violations (specialized audit) for specific functions
6) Lack of active economic code for some businesses and taxation based on it
7) Lack of financially relevant information for small and start-up businesses
8) Lack of integrated monitoring of e-business revenues and providing correct information to the tax office according to various payment methods such as online payment gateway, on-site payment and card to card (E-Commerce Development Center, 2019).

Finally, it should be noted that the country's tax affairs organization issued a statement announcing the tax duties of Internet business owners. Internet business owners (legal entities and individuals), like other economic actors, are subject to tax regulations and, regardless of where they operate, must perform their tax duties so as not to be penalized under the relevant regulations.

3.2. Review of the Literature

Majoral et al. (2021) stated in a study that the number of e-commerce transactions is increasing worldwide. Delivery of goods purchased online has created side effects throughout the supply chain, and in particular growing concern about the distribution of goods. In this study, they have analyzed the cost of taxation of e-commerce. The results show that tax collection can have positive results.

Dastari (2020) stated that today more and more economic activities are done with internet media. E-commerce with internet media or more is known as e-commerce. Tax on e-commerce transactions is one of the tax potentials. The tax revenue potential for e-commerce transactions is enormous, there are many barriers to tax collection in e-commerce transactions, and it serves as a challenge for the tax administration to determine its tax policies. The method used in this study is a qualitative research method that has been used to collect data using library studies. The results of this study showed that there are several conditions that have made the tax on e-commerce transactions difficult. So that the General Administration of Taxation uses the approval of tax regulations for e-commerce transactions as a policy to optimize government revenue from income tax (income tax) and value added tax. Dell'Anno et al. (2019) have estimated the volume of the underground economy and tax evasion in the Romanian country for the period 2000-2017 using the MIMIC method. The results showed that the informal economy acts as a substitute for the informal economy, while tax evasion complements GDP. They have stated that the two phenomena of informal economy and tax evasion in response to business cycles lead to different outcomes and therefore the policymaker needs different policy measures to deal with them. Shokrkhodaei and Salatin (2018) have examined the impact of information and communication technology on tax revenues in the group of selected middle-income countries with emphasis on tax evasion. The results of estimating the models using the generalized torque method in the period of 2002-2005 showed that in the group of selected countries, the theory of the second group is true. Also, the impact of the direct effects of Internet penetration, mobile penetration and secure Internet services as ICT indicators on tax revenues is greater than the impact of indirect effects of these indicators on tax revenues through tax evasion in selected countries.

Karimi et al. (2021) in a study examined the presentation and evaluation of the tax compliance model of legal entities based on the views of tax experts using the underlying theory in the Iranian tax system. Due to the necessity of the subject, the purpose of this study is to present a model for tax compliance of legal entities based on the underlying theory in the Iranian tax system. For this purpose, 25 tax experts were interviewed, including (Deputy Minister of Tax Affairs, Heads of Tax Affairs and Department and Senior Tax Auditors) and using the grounded theory research method, a model including causal conditions, strategies, basic conditions, intervening conditions and consequences regarding corporate tax compliance in the Iranian tax system were presented. Developing and facilitating the relationship between taxpayers and the tax administration by using software tools and identifying the factors affecting tax compliance, including cultural, economic and non-economic corporate is one of the achievements of this study that helps increase corporate tax compliance.

Tax avoidance and evasion are two phenomena that probably date back to the taxation phenomenon itself. Whenever and wherever rulers have decided to impose taxes, individuals and companies have sought to escape or avoid paying them. This phenomenon is expanding in the current era, which is also known as the digital era, and the opportunities of these units have increased, and at the same time, the possibility of identifying them has also become more difficult. From a theoretical point of view, tax avoidance means trying to reduce taxes paid (Hanlon et al., 2010). Tax evasion is a type of legal offense, but tax avoidance is actually a type of using legal loopholes in tax laws to reduce taxes. Tax avoidance within a certain range is for the use of tax benefits and mainly there are no restrictive laws in the field of tax avoidance control (Mohammed Jam, 1379), in better words, any illegal attempt to not pay taxes such as not providing the necessary information It is called tax evasion in the case of taxable income and benefits to the responsible authorities. The phenomenon of tax evasion is significant in that, in addition to reducing government revenues and increasing the level of the tax gap, it also reduces the ratio of tax revenues to gross domestic product (Mubarak, 2014).

Taheri Borujeni and Hosseini (1999) in a study examined the challenges of taxation on e-commerce. Generally, calculations and tax collection are based on the exchange of goods and services, which is done in a tangible way, and this is true in most countries of the world. On the other hand, today with the expansion of the fields of application of information and communication technology, cyberspace and the Internet, in all areas of individual and social life of individuals, we see a new application of this technology in economics that uses electronic economic tools to trade tradition and is shifting to e-commerce. On the other hand, one of the new and potential sources of taxation is tax collection from this large volume of e-commerce. Of course, the taxation of electronic exchanges in our country faces many challenges and due to the importance of this issue, the present study investigates the challenges of collecting taxes from e-commerce and by conducting in-depth interviews with tax elites, information technology and e-commerce and using the Delphi method and method to gather votes and align the views of experts in these areas and reach consensus, the main challenges of collecting taxes from e-commerce in our country are in three dimensions: policy-making, laws, regulations and executive processes and were counted in 20 components, then in order to identify the most important challenges and evaluate the results of previous stages using fuzzy Delphi technique. The research used a triangular fuzzy number 3, a questionnaire of the obtained challenges was prepared and provided to the experts and after three evaluations, the challenges were prioritized.

Hajati et al. (2017) have estimated the income elasticity and tax capacity of Khouzestan province for policy-making and regional planning based on ability to pay tax. For this purpose, the direct and indirect tax revenues of the province were estimated using the method of seemingly unrelated equations in the period 2000-2014. Results show that the revenue elasticity of direct and indirect taxes in Khuzestan province is 1.09 and 2.77, respectively, and the revenue elasticity of total taxes is 1.34. In addition, in the direct tax sector, the tax elasticity of wealth and real estate is greater than the tax elasticity of businesses and corporations. The results show that the tax capacity of the province's businesses is valuable. In addition, the restaurant and hotel sector, and per capita income have a positive and significant relationship. In addition, the relationship between corporate tax capacity and value-added services is positive and significant. While the relationship between the tax capacity of other direct taxes (wealth and real estate) with real value added and economic growth is positive and significant, and the relationship between the tax capacity of indirect taxes with private consumption expenditures and value added of the mining sector is positive and significant. Motalebi et al. (2015) have estimated the shadow economy and tax evasion by considering the behavioral factors in the Iranian economy during the period 1967-2015. Multiple effects (MIMIC) is selected, then the relative size of the shadow economy and the absolute size of the shadow economy are calculated using side information and time series calibration, and finally the resulting tax evasion is calculated. The results showed that the tax spirit and the burden of import tax are the main causes of the emergence of the shadow economy. Therefore, in contrast to developed countries, the changing tax mood increases the shadow economy and the resulting tax evasion, which indicates a lack of tax compliance in Iran. Also, increasing the volume of the shadow economy has the greatest effect on the expenditure index household and energy consumption index. Javaheri (2015) examined the relationship between the development of e-commerce and tax evasion of commercial companies. The results showed that there is a significant inverse relationship between the development of e-commerce and tax evasion of commercial companies. Also, the development of e-commerce infrastructure, reform and development of structures and product development have an inverse and significant relationship with tax evasion of commercial companies and the development of e-commerce infrastructure, reform and development of structures and development of products simultaneously 0.21 of variance explain the tax evasion of commercial companies, and the development of e-commerce infrastructure and the reform and development of tax structures are the best predictors of tax evasion of commercial companies, respectively. Hadian and Tahvili (2013) identified the factors affecting tax evasion in the Iranian economy using the ARDL model during the period 1350-86. The results show that, in the long run, tax rates, complexity of laws and regulations, lack of social capital and inflation have a positive and significant relationship with tax evasion. Rabiee and Ismail Nia Ketabi (2013) study the

capacity and effort Taxes and their relationship to oil revenues of 6 selected OPEC member countries such as Iran, Kuwait, UAE, Venezuela, Algeria and Saudi Arabia. The variables affecting tax capacity include per capita income, openness of the economy (total exports and imports to GDP), the ratio of oil revenue to GDP and tax capacity with a one-time interval. Oil revenue has a positive correlation with GDP and tax capacity with a one-time break and has a significant tax capacity. With the aim of measuring the efficiency of tax capacity in the provinces of Iran during the years 2004-2009, in terms of cost efficiency, Goghardchian et al. (2012) have studied the effect of electronic banking on it in the period of 2009. To measure the efficiency, the technical inefficiency effect model of Betis and Coelly (1995), which is based on the estimation of the factors affecting the performance, has been used using a random boundary method. Research findings show that each of the e-banking indicators separately will have a different effect on the efficiency of tax capacity, so that in the first model, ATMs and the growth of value-added sectors, improve the efficiency of the country's tax capacity. In the second model, sales terminals and value added growth of the service sector have no effect on the efficiency of tax capacity, but the growth of value added of agriculture, industry and mining sector improves the efficiency of tax capacity. In the third model, branch terminal and value added growth of industry and services sectors improve the efficiency of tax capacity, but value added growth of the agricultural sector does not affect the efficiency of tax capacity.

3. Methodology

3.1. MIMIC Approach

- The innovation of this study is to examine the following:
- According to the researcher's investigations, until today, no study in Iran has been done to estimate the capacity and tax evasion of e-commerce in a systematic way.
- In various studies, a single index approach has been used to measure the underground economy, but here, a combined index approach using the MIMIC method will be used.
- In various studies, capacity and tax evasion are measured linearly, in other words, under different economic conditions, they only determine a certain amount of capacity and tax evasion, while depending on different economic conditions, capacity and tax evasion also suffer It changes and evolves. Based on this, the approach of regime change is used to estimate the capacity and fiscal surplus, which is the first time that it is examined in the country.

The Structural Equation Model (SEM) shows the relationship between the invisible latent variable and the observed indicators and causes (MIMIC). This model is widely used in many social sciences and economics. In economics, one of the first researches on the application of the SEM method was conducted by Goldberger in 1979. In his study, a special form of structural equations called multiple index and multiple causes has been used. This template is briefly introduced below.

Multiple Indicators Multiple Causes (MIMIC) is an econometric model and a special case of structural equation modeling and is the most common method for measuring latent variables. Multiple Indicators Multiple Causes have a latent variable η, which is assumed to have multiple causes and effects, and the latent variable η is also assumed to be linearly related to causes x_q and effects y_p. In the multiple indicators multiple causes model, an equation system similar to regression analysis is first introduced.

$$\eta_t = \gamma' x_t + \xi_t (۶)$$

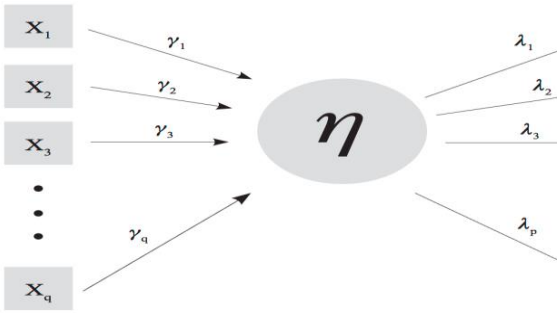
Where the vector$x_t = [x_{1t}, x_{2t}, \ldots, x_{qt}]'$ (q * 1) of the cause variables η_t is the latent variable and the vector γ' (q * 1) of the described coefficients of the cause variables is the effect of the latent variable and the error sentence ξ_t. Model (6) is called a structural equation based on a regression model with a latent dependent variable. Since η_t is a latent variable and cannot be calculated directly, therefore, the effect of the latent variable on other explicit variables is considered. These variables are called effects, and their relationship to the latent variable is as follows:

$$y_t = \lambda \eta_t + \varepsilon_t \qquad (7)$$

Equation (6) is a measurement model, in which the vector $y_t = [y_{1t}, y_{2t}, \ldots, y_{pt}]'$ (p * 1) is one of the effects variables and the vector λ (p) is a descriptive

coefficient between the latent variable $\eta_t$and the effect variable y_t, and ε_t is the error of the measurement model, which is assumed it is a white noise $I(0)$. In Equations (6 and 7) it is assumed that the mean of the error sentences is equal to zero($E[\xi]=0, E[\varepsilon]=0$), and there is no two-way correlation between the error sentences. In the model of multiple causes, the effects of multiple variables are calculated as deviations from the standard. Therefore, in addition to the error statements,$E[x_t], E[y_t], E[\eta_t]=0$, it is assumed that there is no two-way correlation between the structural equation error statement and the latent variable causes $E(x_t,\xi_t), E(\xi_t,x_t)=0$. It is also assumed that the error statement in the measurement model has no two-way correlation with causes x_t and latent variables $\eta_t E(x_t,\varepsilon_t), E(\varepsilon_t,x_t), E(\eta_t,\varepsilon_t), E(\varepsilon_t,\eta_t)=0$ (Clarick, 2011: 64-65).

Diagram (1) Multiple Indicators Multiple Causes



According to the diagram above, two sets of observable variables are connected by a latent variable, which is as a system of regression equations (8):

$$\eta_t = \gamma' x_t + \xi_t$$
$$y_t = \lambda\eta_t + \varepsilon_t \Rightarrow \lambda^{-1}(y_t - \varepsilon_t) = \eta_t$$
$$\lambda^{-1}(y_t - \varepsilon_t) = \gamma' x_t + \xi_t$$
$$y_t = \lambda\gamma' x_t + \lambda\xi_t + \varepsilon_t$$

The system of equations (8) can be summarized as follows:

$$y_t = \Pi x_t + V_t \qquad (9)$$

Where it contains $\Pi = \lambda\gamma'$ and $V_t = \lambda\xi_t + \varepsilon_t$. The system of equations (9) is facing the problem of identification. But if one of the elements λ is bound by a predetermined value, its factors can be estimated. Of course, in this case, only the relative values of the factors can be estimated. Then, using the estimatorλ and Equation (7), a series of sequences of the latent variables can be obtained. This problem is easily solved by the rule accepted by Giles and Tides (2003). Because the Multiple Indicators Multiple Causes (MIMIC) model cannot determine the scale of all parameters, thus a normalization condition is required, and the rule is to determine the first element λ as single. $\lambda=+1$ or $\lambda=-1$. If the relationship between η and $y_t$is theoretically positive, it will be $\lambda=+1$, and if the relationship between η and $y_t$is theoretically negative, it will be $\lambda=-1$. If the relationship between η and y_t is theoretically ambiguous, then according to Anno (2003), Reductio ad absurdum strategy should be used to determine the scale coefficient sign. That is because the vector of structural coefficients of Multiple Indicators Multiple Causes model is a ratio of the coefficients of scale. When the signλ changes, the structural parameters $\gamma_q$of the causes change from positive to negative and vice versa. But their absolute value will not change. Therefore, if in the case of $\lambda=+1$, the signs of the estimated coefficients that relate the latent variable to its causes are in conflict with theories and empirical studies, then it would be wise to accept the hypothesis that supports the opposite sign $\lambda=-1$to relate the latent variable to the reference variable.

The actual estimation of the parameters in the MIMIC model is obtained using the model covariance matrix:

$$\sum = \begin{bmatrix} \Pi\Phi\gamma + \lambda\psi + \Theta & \Pi\Phi \\ \Phi\Pi' & \Phi \end{bmatrix}$$

Klarić (2011)

After estimating the parameters of the above model, using the estimation of vector elementsγ in the form of regression equation in which the relationships of causes with the latent variable are specified, the time series of the latent variable is estimated as equation (10).

$$\hat{\eta}_t = \hat{\gamma}_1 x_{1t} + \hat{\gamma}_2 x_{2t} + \ldots + \hat{\gamma}_q x_{qt} \qquad (10)$$

Because the latent variable is not measurable, the researcher must scale one of the works to the unit of the latent variable. The same effect whose parameter is considered a unit. The estimated values are not absolutely interpretable but are evaluated and interpreted in relation to other parameters. The time

series obtained is ranked numbers. After estimating the different patterns, the best pattern will be selected. In selecting the final model for measuring the hidden variable index, two criteria are considered: Adaptation of the signs of the parameters with their theory and meaning and with the meaning of the whole model (Zahed Gharavi et al., 2017).

3.2. Development of Research Hypothesis

Taxing e-commerce based on traditional concepts is difficult due to the specific features of the digital space. In e-commerce, papers are only occasionally used, and because buying and selling goods and services in such an environment is often anonymous, especially when new payment tools such as electronic money are used, it is not possible for a tax official to determine the location of the transaction, the volume and amount of the transaction, the physical condition of the seller, and so on. The lack of geographical boundaries in e-commerce raises legal issues that old ways of doing business have never encountered, and because web addresses do not reflect a person's actual address, it is not easy to identify the country to which the tax is levied or should be paid. This makes tracking e-transactions costly and even impossible for tax authorities. In addition, e-commerce is not confined to physical borders and people can do business in different countries. These two issues can be a threat to countries' financial incomes. More importantly, there is a competitive shift between the new economy and the traditional economy, which, in the event of significant tax evasion in e-commerce, reduces gross prices in this type of business compared to traditional business methods (Mahmoudzadeh & Hassanzadeh, 2006).

In fact, it should be noted that e-commerce is one of the best platforms for tax evasion. In this regard, however, the government and tax authorities are forced to bear the cost of detecting and preventing tax evasion. For this reason, finding ways and means that can detect tax evasion has always been an important and challenging issue. If the government fails to detect tax evasion, public investment will be negatively affected by tax cuts and consequent reductions in government revenues (Wu et al., 2012). Statistics and images created in an efficient and fair tax system can be a software and scientific controller to improve the level of economic efficiency and transparency of information published in different economic areas of each country (Abdoli et al., 2013).

According to the issues raised, the hypothesis of the current research is as follows:

Hypothesis: The tax capacity of e-commerce in different regimes is significantly different.

4. Research Model

In this study, to estimate the tax capacity of e-commerce on a regime basis, first the total tax capacity of the country in terms of variables related to e-commerce and other variables is estimated as follows:

$$\begin{aligned} LTAXTGDP_t = {} & \delta_0(s_t) + \delta_1(s_t) LVA_t^{ind} \\ & + \delta_2(s_t) LVA_t^{agr} \\ & + \delta_3(s_t) LVA_t^{sernict} \\ & + \delta_4(s_t) LVA_t^{con} \\ & + \delta_5(s_t) \mathrm{LGDPP}_t + \varphi_1(s_t) LVA_t^{ict} + \varphi_2(s_t) LVLMC_t \\ & + \varphi_3(s_t) LATM_t \\ & + \varphi_4(s_t) LPINPAD_t \\ & + \varphi_5(s_t) LIND_t + \varphi_6(s_t) LMOBD_t + e_t(s_t) \end{aligned}$$

The described part of the template is then measured by the e-commerce variables as e-tax capacity on a regular basis. In fact, here, the tax capacity of the whole country, including the tax capacity of e-commerce and the capacity of other taxes, is divided, so we have:

$$\begin{aligned} LETAXTGDP_t(s_t) = {} & \varphi_1(s_t) LVA_t^{ict} + \varphi_2(s_t) LVLMC_t \\ & + \varphi_3(s_t) LATM_t \\ & + \varphi_4(s_t) LPINPAD_t \\ & + \varphi_5(s_t) LIND_t + \varphi_6(s_t) LMOBD_t \end{aligned}$$

4. Research Variables

In the above equations, $LTAXTGDP_t$ the natural logarithm of the ratio of total tax to GDP in year t; LVA_t^{ind}: Natural logarithm of the value added share of the industrial sector of total GDP in year t; LVA_t^{agr}: Natural logarithm of the share of value added of the agricultural sector in the total GDP in year t; $LVA_t^{sernict}$: Natural logarithm of value added share of service sector except ICT sector (ict) of total GDP in year t; LVA_t^{con}: Natural logarithm of the value added share of the construction sector of total GDP in year t;

$LGDPP_t$: Natural logarithm of GDP per capita at a fixed price in 2012 in year t; LVA_t^{ict}: Natural logarithm of ICT share of total GDP in year t; $LVLMC_t$: Natural logarithm of the ratio of total online transactions in the stock market to GDP in year t; $LATM_t$: Natural logarithm of penetration coefficient of bank ATMs per 100 thousand people in year t; $LPINPAD_t$: Natural logarithm of bank branch terminals per 100 thousand people in year t; $LIND_t$Natural logarithm of Internet penetration per 100 people per year t; $LMOBD_t$: Natural logarithm of mobile penetration coefficient per 100 people in year t; s_tStatus or regime variable in year t; e_t: Remaining model in year t and: $LETAXTGDP_t$Tax capacity of e-commerce as a share of GDP in year t.

5. Experimental Findings

5.1. Descriptive Statistics of Variables

Before entering into the modeling topics, in order to identify the main study variables that are related to the fundamental factors of tax capacity in the field of e-commerce, a descriptive analysis of the variables has been performed in Table (1).

Table 1: Descriptive Statistics of Variables

Variable	Mean	Median	Maximum	Minimum	SD	Kurtosis	Skewedness	(JB)	Probability JB
LVLMC	-8833/5	-7609/4	-3324/2	-1598/14	2434/3	-3064/1	6773/3	9648/13	0009/0
LVASERNICT	7241/3	7397/3	9055/3	3141/3	1207/0	-5830/1	8538/5	8204/34	0000/0
LVAIND	0766/3	0824/3	2478/3	6831/2	1019/0	-1681/1	2203/6	3383/30	0000/0
LVAICT	9483/1	9583/1	3705/2	3992/1	2135/0	-4071/0	2338/3	3756/1	5027/0
LVACON	9923/1	9620/1	4828/2	3838/1	2629/0	-0109/0	3314/2	8577/0	6513/0
LVAAGRI	2147/2	2505/2	7574/2	6995/1	2809/0	0846/0	0510/2	7811/1	4104/0
LTAXTGDP	7412/1	7295/1	1034/2	2758/1	2099/0	-2526/0	4633/2	0412/1	5941/0
LPINPAD	2637/3	2691/3	4725/3	0793/3	1049/0	-0167/0	0946/2	5732/1	4554/0
LMOBD	4697/1	0587/0	6956/4	0000/0	9005/1	7624/0	8001/1	2160/7	0271/0
LIND	1407/1	0099/0	2627/4	0000/0	5019/1	8212/0	0821/2	7847/6	0336/0
LGDPP	2501/4	2376/4	7675/4	8306/3	2349/0	3031/0	2380/2	8172/1	4031/0
LATM	2012/1	1432/0	4852/4	0000/0	6359/1	9640/0	2348/2	2474/8	0162/0

Reference: The Study Findings

5.2. Modeling

Then modeling was done. Time series models were used for this purpose. Time series modeling is based on the assumption of durability of variables. The solution in this case is to use single root tests whose null hypothesis is based on time series significance. The most famous statistic for testing the null hypothesis is that the KPSS statistic series is valid, which has been introduced by "Kwiatkowski, Philips, Schmidt and Shin" (Mohammadi & Talebloo, 2008). Based on the results of the KPSS unit root test, the null hypothesis of this test that is based on no unit root for all variables during the period 1973-2014 is accepted (Table 2). The results show that all the studied variables will be free from the problem of falsehood.

In this study, to measure the tax capacity of e-commerce, it is necessary to model the total tax capacity based on the fundamental factors of e-commerce and non-e-commerce. Then the described part of the model should be used as the tax capacity of e-commerce based on the fundamental factors of the e-commerce sector. Therefore, here, Markov rotation method is used to estimate the relationship (1) during the period 1973-2014 in Table (3)

Based on the minimum AIC criterion in Table (3), a three-regime model with width from the origin, coefficients and standard deviation of the regime compared to competing models has been selected. Based on the linearity test, this regime model is preferable to the non-regime and linear model. The results of normality test, lack of autocorrelation and variance homogeneity also show that the estimated model has no regression detection problems due to autocorrelation and variance heterogeneity.

Based on the model estimated in Table (3), all the variables used in the model in all three regimes have a significant effect on the total tax capacity, so that the size of these coefficients in each regime is different from the other, even in some coefficients of change. The coefficient sign is also seen. This shows that the degree of influence and direction of the fundamental variables of total tax capacity on tax capacity varies depending on the total tax capacity regime, and one variable cannot be expected to have the same effect on total tax capacity in all circumstances.

Since all variables are logarithmic, they have elastic interpretation coefficients such that the total tax capacity per one percent change in per capita income variables, the share of value added in agriculture, the share of value added in industry and mining, the share of value added in construction, value added share of service sector (excluding information and communication technology), value added share of information and communication technology, Bank ATM penetration coefficient, bank branch terminal penetration coefficient, mobile penetration coefficient, Internet penetration coefficient and ratio of online stock transactions to GDP In the zero regime, 1.2457, 0.9748, 0.034, 0.320, 0.831, 0.544, respectively, 2812/1 -, 1205/2 -, 0437/1, 0477/0 and 0027/0 -; In diet one, 2.2735, 0.4484, 0398/0, 0891/0, 8950/1, 4899/0, 0.3801, respectively. 2484/0, 1786/0, 0013/0 and 0123/0; In the second regime, 0.5725, 1.425 - 0.348, 0.5187, 3.5108, 8720, respectively. 0 -, 55562, - 0257 -, 1963 - -, 2174 - and - 0708 - percent will change.

Based on the transfer probability functions, the total tax capacity is more likely to be in regime one. So if it is in this regime, with a probability of 50.38%, it will remain in this regime next year, and with a probability of 22.73%, it will be transferred to the zero regime and with a probability of 33.31% to the second regime. If it is transferred to the zero regime, it is likely that 22.73% will remain in this regime next year, but 27.82% is likely to return to the first regime next year and 49.45% is likely to be transferred to the second regime. If it is transferred to diet 2, there is a 30.92% chance that it will remain in this diet next year, 24.83% is likely to be transferred to diet one and 44.25% is likely to be transferred to diet zero. Based on the cumulative probability functions, the probability that the zero, one and two regimes are established in relation to the total tax capacity, respectively, is equal to 28.89, 33.33 and 37.78 percent, each of which averages 1.3, respectively. , 1.88 and 1.42 years last. Based on the estimated model, the tax capacity of e-commerce can be calculated separately for the three regimes based on Equation (2). This issue is shown below.

Table 2: Results of KPSS Unit Root Test for the Variables Used in the Research

Variable	KPSS	Critical values at the significance level			Result
		One percent	Five percent	Ten percent	
LVLMC	3194/0	7390/0	4630/0	3470/0	Variable is at permanent Level
LVASERNICT	2533/0	7390/0	4630/0	3470/0	Variable is at permanent Level
LVACON	3588/0	7390/0	4630/0	3470/0	Variable is at permanent Level
LVAICT	4568/0	7390/0	4630/0	3470/0	Variable is at permanent Level
LVAIND	2500/0	7390/0	4630/0	3470/0	Variable is at permanent Level
LVAAGRI	0876/0	7390/0	4630/0	3470/0	Variable is at permanent Level
LTAXTGDP	1688/0	7390/0	4630/0	3470/0	Variable is at permanent Level
LPINPAD	3761/0	7390/0	4630/0	3470/0	Variable is at permanent Level
LMOBD	1665/0	7390/0	4630/0	3470/0	Variable is at permanent Level
LGDPP	4150/0	7390/0	4630/0	3470/0	Variable is at permanent Level
LIND	1672/0	7390/0	4630/0	3470/0	Variable is at permanent Level
LATM	4210/0	7390/0	4630/0	3470/0	Variable is at permanent Level

Reference: The Study Findings

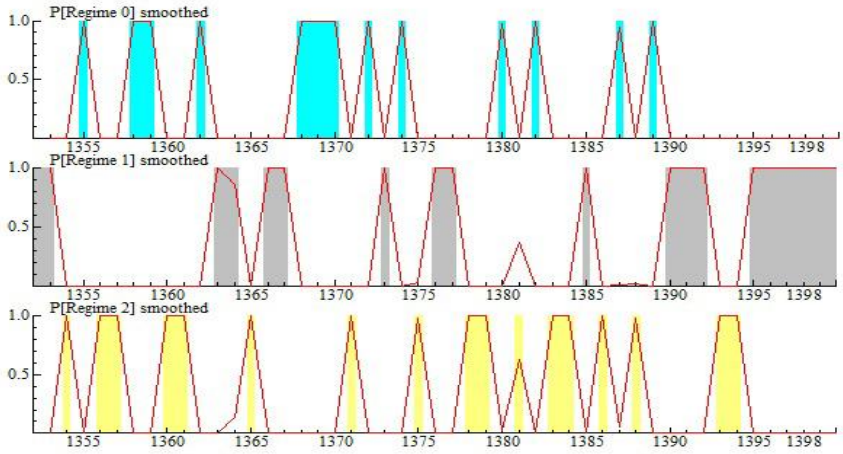


Figure 1: The Trend of Probability of Occurrence of Different Regimes of Total Tax Capacity during the Period 1973-2014.

The Natural Logarithm of the Tax Capacity of E-Commerce in Different Regimes

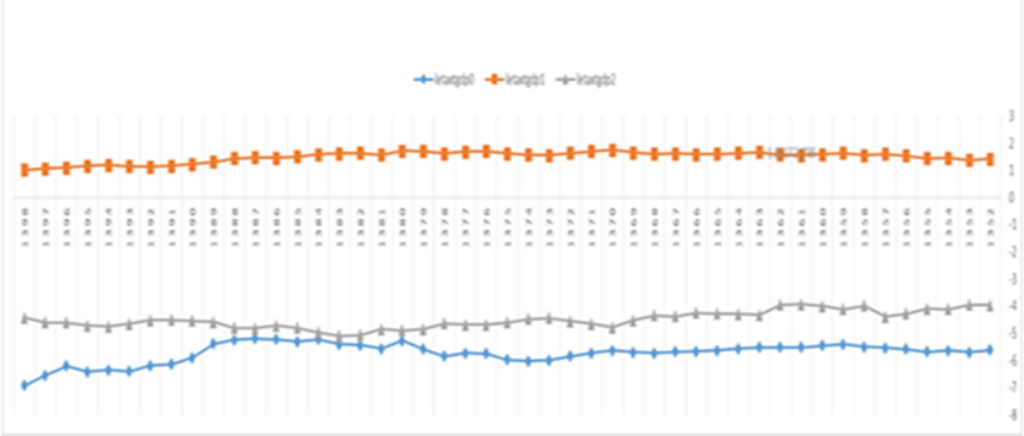


Figure 2: Natural Logarithm Trend of Tax Capacity on E-Commerce in Different Regimes during the Period 1973-2014.

Discussion and Conclusion

In recent years, e-commerce has been widely used by various economic sectors, while a variety of businesses have been formed in connection with e-commerce. Although e-commerce plays a fundamental and desirable role in economic growth due to its functions in improving processes, reducing costs, increasing productivity, etc., but collecting taxes on matters related to e-commerce faces major challenges. At the same time, e-commerce and related tax revenues are vital as a new and major tax base and source. This emerging phenomenon can be a major source of taxation in the coming years, so the attention of macro-policymakers and the organization at the moment and planning and investing in this direction is very vital and will prevent future shortcomings (Ebrahimi et al., 2009).

On the other hand, the specific features of e-commerce such as location selection, digital nature of products, the emergence of new assets, new

registration methods and electronic payment methods are not compatible with the previous tax system and are considered challenges in e-commerce. Before addressing these challenges, the question arises as to whether e-commerce should be taxed or tax-exempt. What are the benefits and costs of Internet tax exemption? At present, due to the small volume of e-commerce compared to the mainstream business and also due to the type of products exchanged on the Internet, tax exemption on e-commerce will have little effect on reducing government tax revenue. In addition, e-commerce at its current level does not deviate from the mainstream business. So this way of doing business does not create much inefficiency. Not applying taxes on e-commerce allows people with more income and education to earn more benefits and not pay taxes. This effect will decrease significantly in the next few years due to the increasing use of the Internet. Therefore, in the short term (which should be clearly defined) the implementation of the tax exemption policy is the best policy available. The experiences of different countries show that countries in formulating e-commerce tax policy emphasize the simplicity of law, enforceability and compatibility with the previous method. These countries have also paid special attention to international cooperation in taxation of e-commerce, support for this method of trade and non-imposition of double taxation on it. The criteria for drafting an e-commerce tax law have been evaluated. The most important of these criteria are: economic principles (economic efficiency and distributive effects), simplicity and compatibility, specific nature of e-commerce, avoidance of double taxation, tax discrimination, protection of small and medium industries, the principle of non-discrimination, international competitiveness and globalization, technological dimension and security of transactions, compliance with these criteria will reduce the tax burden and increase efficiency considerably.

In this study, the tax capacity of e-commerce has been estimated in the form of regime change models during the period 1973-2014. In this regard, total tax capacity is a function of the ratio of total tax to GDP, the share of value added of the industrial sector in total GDP, the share of value added of the agricultural sector in total production GDP, share of value added of services sector except ICT sector (ICT) of total GDP, share of value added of construction sector of total GDP, GDP per capita at constant price 2012, share of value added of technology sector Information and Communication (ICT) of the total GDP, the ratio of total online transactions of the stock market and securities to the GDP, the penetration rate of bank ATMs, the penetration rate of bank branch terminals, the Internet penetration rate, the mobile penetration rate Then, using Markov's rotational approach, the model was estimated. The estimation showed that the total tax capacity follows a three-regime behavior, in all three regimes the independent variables had a significant effect on the total tax capacity, but the size of these coefficients in each It was different from the regimes and even in some cases it was different for the effect. Based on the results, it can be stated that the degree of influence and the effect of the fundamental variables of total tax capacity on tax capacity varies depending on the economic conditions. The specified model is variable The value-added shares of information and communication technology, bank ATM penetration rate, bank branch terminal penetration coefficient, mobile penetration coefficient, internet penetration coefficient and the ratio of online stock trading volume to GDP were considered as e-commerce tax capacity. The tax capacity variable of e-commerce was measured in three regimes: status (zero, one and double. The observed results are in line with the results of the study of Majoral et al. (2021), Taheri Boroujeni and Hosseini (2020) which confirms the hypothesis.

Studies show that the development of e-commerce requires an appropriate legal framework to ensure that companies and individuals are adequately protected during financial transactions. Despite the development of a comprehensive program for the development of e-commerce in Iran under the Deputy Minister of Planning and Economic Affairs of the Ministry of Commerce in the framework of the fourth plan in the Council, this program has still been approved in coordination with various agencies and its implementation and it is far from providing the necessary infrastructure. On the other hand, the weakness of existing laws in the field of legal issues, customs and taxes, as well as the lack of appropriate codified laws in the field of dealing with cybercrime, is a serious obstacle in this (Golchehreh Toudehi, 2012). Also, considering the effective factors of increasing or decreasing taxes in the structure of Iran's economy, in order to increase the share of the ratio of tax revenues to GDP (T/GDP), tax planners and policy

makers should be able to be the most important influential variables in this field. Recognize swimming and the direction of their effect. Over the past 50 years, the tax rate in Iran and its share of GDP has been less than 10 percent, which is very low (compared to the average of 28 percent for developed countries). Considering that an important part of tax revenues in Iran is directly and indirectly dependent on oil revenues; This has made tax revenues highly vulnerable to fluctuations in the global oil market, despite existing efforts. Also, the growth of budget resources from the sale of oil, in practice, has reduced the field of taxation (Garaee Nezhad & Chapardar, 2012). Actually, this suggests that a proper and efficient taxation of e-commerce should be planned and targeted. Therefore, due to the reliance of a high percentage of the country's budget on oil revenues, so far it has paved the way for the growth of the public sector, the implementation of expansionary policies, the incidence of the Dutch disease and the increase in the general level of prices. The continuation of this trend in recent years has turned it into a chronic and structural problem. The dependence on financing for oil prevents the discovery of tax capabilities and, as a result, deprives the country of having other standard incomes. The most rational and natural ways of governing developed councils are tied to the tax system. In fact, high oil revenues in Iran reduce the tax incentive because government spending is financed through these revenues. Therefore, it seems that reducing the dependence of the public budget on oil and increasing the share of taxes, especially taxation on e-commerce in it is inevitable.

Examining the trend over the years under review reveals that although much effort has been made to improve this proportion of simplification of laws, reform of rates, etc. during these thirty years, this important issue has not been realized yet and Iran is engaged in the ominous and abnormal phenomenon tax evasion, especially in the field of e-commerce. Thus, it is necessary to prepare efficient executive solutions for it.

Applied Research Suggestions

1) The effect of e-commerce on imports is important to the government because of features such as protection of domestic products, prevention of the import of unnecessary and luxury goods, and earning money for the government. E-commerce, due to its features such as elimination of geographical distances, no need for physical presence to conduct transactions, reduction or elimination of intermediaries, lack of physical control, increases the volume of international exchanges and consequently imports. The lack of tax rules for e-commerce at the international level is one of the issues facing countries with declining import tax revenues. Despite specific international laws for countries as well as the possibility of identifying as many activities as possible at the international level, e-commerce can increase the volume of import tax revenues. Therefore, cooperation with a business partner in the medium term is essential for the application of international law.
2) The Ministry of Economy and Finance can provide the necessary grounds for electronic taxation, such as filling out tax returns and forms, or in other words, an easier and less costly method. This can be an incentive for companies to pay their taxes properly and on time. It is difficult to identify companies and subsequently identify the time, volume and amount traded by them. As a result, the amount of corporate tax is reduced due to the unrecognizability of companies, which in turn will reduce the total amount of tax revenues. The way to deal with this problem is to identify the companies and the volume of activities carried out by them. Therefore, arrangements should be made for online stores to obtain a license in order to be able to collect taxes with the information in hand.
3) Sales tax as one of the types of indirect taxes has the most impact on e-commerce compared to other tax items. Due to the strong impact of this type of tax revenue on e-commerce, this issue has been given special attention by governments.
4) The effect of e-commerce on income tax (payroll tax, employment tax and real estate tax) and wealth tax is less.
5) The experience of countries shows that countries have tried to cover the issues of electronic taxation by reviewing the existing tax law. Therefore, in Iran, this issue can be

solved by considering new materials and comments. One of the important advantages of this issue is that it prevents the creation of multiple laws.

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