Estimating Shadow Economy and Tax Evasion by Considering the Variables of Government Financial Discipline and Behavioral Factors in Iran's Economy

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Abstract

Low tax incomes and the large size of the government in Iran lead to a budget deficit, which increases the inflation rate. It also causes economic instability and fluctuations in inflation, leading to tax non-compliance and the transfer of people to the informal economy. Therefore, considering the variables of financial discipline and behavioral factors, this research examines these variables' effect on the shadow economy's size and the tax evasion caused by it in Iran from 1967 to 2015. For this purpose, first, we select eight models, and the final model is selected with the Multiple Indicators and Multiple Causes (MIMIC) approach. Then, using the side information and calibration of the time series, the relative and absolute sizes of the shadow economy and the tax evasion resulting from it are calculated. The results indicate that the tax morale and tax burden on imports and unemployment rates are the main causes involved in the creation of the shadow economy. Moreover, the results indicate that the effect of behavioral factors on increasing the size of the shadow economy and tax evasion resulting from it is more than that of variables of financial discipline in Iran.
Keywords: Shadow Economy, Tax Evasion, Government Financial Discipline, Behavioral factors, Multiple Causes, and Multiple Indicators.
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1. Introduction

Tax evasion is a major economic problem, which almost all countries face with it in the world. Murphy (2011) examined the global scale of

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losses caused by tax evasion in 145 countries in 2010 and estimated it to be about 3.1 trillion US dollars. It accounts for 98 per cent of global GDP and 55 per cent of spending on health protection in 145 considered countries. Activities performed for the aim of tax evasion, avoiding price control and to stay away from the eyes of the authorities are also considered as shadow economy activities. The shadow economy estimation is typically more than 40% of the official GDP in the economies of the developing world (Gërxhani, 2004; Laporta and Sheleifer, 2008; Schneider, 2005, 2007; Schneider and Enste, 2000). These high figures indicate that tax is not taken from large parts of the activities, since they remain undeclared and unrecorded. This erosion of the tax base is a major challenge for government finance.

Since tax, as one of the most important sources of government income, plays an important role in implementing financial policies and affects key macroeconomic variables such as inflation and unemployment, it is important to examine this issue from different perspectives (Amin Khaki, 2012).

The current research is conducted to estimate the shadow economy and tax evasion by considering the variables of financial discipline and behavioral factors in Iran. Financial discipline in the macro level is the observation of the ceiling predicted for the total public sector expenditure within the framework of the realizable incomes in a financial period and the optimal allocation of funds between different programs implemented by government agencies and institutions (Shaghaghi, 2006). We also consider the variables of tax morale, tax fairness and tax complexity for behavioral factors, based on the Jackson and Milliron (1986).

Given the large size of the government, and the shortage of income, the Iranian government has faced a budget deficit in most of the years of this study, which this deficit is mostly financed through borrowing from the central bank (printing new money). In addition to this method, following the targeted subsidy plan in recent years, due to low tax incomes caused by low tax compliance, the budget deficit is financed through the sale of petroleum dollars in the free market, led to high exchange rate fluctuations and higher inflation. Both these cases affect the size of the shadow economy. On the other hand,

people's lack of trust in the authorities on the correct spending of taxes leads to a low tax morale and non-compliance. The lack of transparency in laws and regulations, the ineffectiveness of the administrative structure, and factors like this increase the complexity of the tax system, and provide the conditions for transfer of most people to shadow economy. Thus, based on the explanations presented in this research, the effect of the variables of the government financial discipline, for which three variables budget deficit, inflation rate and government size are considered, and behavioral factors on the size of the shadow economy and its tax evasion is examined. Thus, this research aims to find an answer for the question whether government financial discipline factors or behavioral factors more affect the shadow economy and tax evasion in Iran.

In previous studies in the shadow economy by the MIMIC method, financial discipline and behavioral factors have not been considered in the model as selected variables in the present study. For example, Schneider (2010) and Schneider et al. (2015) among the variables mentioned, considered only the variable of tax morale among behavioral factors in the estimation of the shadow economy model. Also, among the studies that considered the variables of financial discipline in this study, Abounoori and Nikpour (2014) and Samati et al. (2009) considered two variables of inflation rate and government size. In this study, along with other important factors affecting the shadow economy in Iran, three variables such as inflation rate, budget deficit and government size as financial discipline variables and three variables of tax morale, tax fairness and tax complexity were considered as behavioral factors. In the final model of the estimation of shadow economy, four variables such as inflation rate, budget deficit, and tax morale and tax fairness along with other variables affecting the shadow economy were introduced in the model, all of which have a significant effect on the shadow economy.

In the second section of this paper, we review the theoretical principles and literature of relevant studies. The research method is presented in section 3 and the research findings are presented in the section4. Section 5 also provides the conclusions and recommendations of this research.

2. Theoretical Principles and Research Literature

2.1 Theoretical Principles

The first and the most difficult problem for researchers in trying to measure the size of the shadow economy is the way to define it. One of the broader definitions is "economic activities and income derived from them, which evades the government monitoring, tax, or observation (Dell'Anno & Schneider (2004) and Feige (1989)).

This paper uses the more limited definition of shadow economy, presented in Schneider and Buehn's (2017) study. The shadow economy includes all market-based legal production, which are deliberately hidden from the vision of public authorities due to the following reasons:

1- To avoid paying tax, such as income tax or value added tax. 2- To avoid paying social security contributions. 3- To avoid labor market certain legal standards, such as minimum wages, maximum working hours, etc. and 4- To avoid complying with certain administrative procedures, such as completing statistical questionnaires or other administrative forms.

Allingham & Sandmo (1972) in their study theoretically examine the shadow economy and tax evasion. The objective of their study is to analyze the decision to evade or not to evade by a taxpayer and the extent to which taxes are evaded by intentional underreporting. They argue that the tax rate increases the tax evasion, but the risk of discovery and fine levels decrease it. As a result, the relationship between the amount of income reported and the actual income of the taxpayer is ambiguous.

The reasons for tax evasion are based on three theoretical views, including general deterrence theory, economic deterrence models and fiscal psychology (Riahi-Belkaoui, 2004).

The general deterrence theory states that the level of crime decreases by considering the penalty, which its severity should be proportionate to the crime to be effective (Stack, 2010). This theory refers to the ability of a legal system (through penalties) to reduce tax evasion in one country. Economic deterrence models focus on the cost-benefit framework. Therefore, the taxpayer will evade taxation as long as the pay-off from evading is greater than the expected cost of being caught (Hasseldin & Bebbington, 1991; Devos, 2014). These models state that the economic, legal and institutional characteristics

of one country (for example, the level of enforcement, corruption, bureaucracy, competition laws) affect tax evasion activities.

Finally, fiscal psychology models test the attitudes and beliefs of taxpayers in order to predict their behaviors (Hasseldin & Bebbington, 1991).

Tax evasion literature distinguishes between micro direct approaches and macro indirect approaches (Gemmell & Hasseldine, 2012). Micro approaches are based on taxpayer data, surveys, and tax auditing to measure the extent of tax non-compliance, macro indirect approaches estimates the size of shadow economy based on macroeconomic assumptions and models. This study uses indirect approaches and estimates of shadow economy to estimate tax evasion. Schneider (2004) lists the indirect methods as follows.

1- Discrepancy between national expenditure and income statistics 2 –Discrepancy between the official and actual labor force 3- Transaction approach 4- Currency demand approach 5- Physical input (electricity consumption) and model approach, MIMIC model (latent variable models)

Most of the estimation methods of shadow economy consider only one indicator to show all shadow economy impacts, but shadow economy effects emerge simultaneously in production, labor force, and monetary markets. The model approach explicitly considers multiple causes of shadow economy growth as well as the multiple indicators of shadow economy over time.

2.1.1 Shadow Economy Causes

The emergence of the shadow economy depends on different causes and the economic and political conditions of countries. In Iran's economy, various studies have shown different factors for shadow economy, which the most of them are as follows:

Tax burden: total tax burden deviation affects labor-leisure choices and may stimulate labor supply in the shadow economy. More difference between the total labor cost in the official economy and after-tax earnings (from work), is the biggest incentive to reduce the tax wedge and work in the shadow economy (Schneider & Boehn, 2017). Therefore, it can be stated that the increase in tax burden will increase the size of the shadow economy in Iran.

Income derived from natural resources: Assessing the effect of

this variable on the shadow economy given its role in the Iranian economy can be considered important. With increasing oil incomes, the government's current budget increases. It also increases inflation rate. As a result, the willingness to engage in underground activities would increase (Sameti et al., 2009; Abounoori & Nikpour, 2014). Moreover, with increasing oil incomes, the shadow economy is expected to increase.

Unemployment rate: based on Schneider and Williams (2013) and Williams and Schneider (2016), higher unemployment rate increases the likelihood of working in the shadow economy. Based on the previous studies in Iran, it can be expected that unemployment growth to increase the incentive for activities in unauthorized and prohibited areas and increase the size of the shadow economy.

Per capita income: Increasing per capita income and providing the minimum living resources can reduce the incentive to take risks of unlawful and informal acts and reduce the size of the shadow economy. Based on the Schneider (2012) findings, lower per capita GDP in a country provides a higher incentive to operate in the shadow economy, especially in developing countries where GDP per capita is lower than that in developed countries, the incentive for activities in the shadow economy is higher.

Inflation rate: The growth of the general level of consumer goods price (inflation) for various reasons can lead to an increase in shadow economy. Empirical evidence also confirms such a relationship in Iran (Arab Mazar Yazdi, 2001). With an increase in inflation rate, we expect the size of the shadow economy to increase.

Government size: the expansion of the size of government increases executive costs and creates a double burden on the tax budget that may force the government to increase tax rates (Acemolgo, 2005), and force firms to tax evasion. An increase in the size of the public sector or the degree of regulation of the economic system increases the tendency to enter the activities of the shadow economy sector.

Budget deficit: Generally, the budget deficit may increase by the increases in the size of the shadow economy. Tax authorities who do not pursue legal proceeds in tax evasion cases acts to the detriment of state treasury and reduce incomes compared to government

expenditures (Raczkowski, 2014). Low government incomes, in turn, reduce the quality and quantity of publicly provided goods and services. Ultimately, the budget deficit will lead to increasing tax rates for firms and individuals. As a result, the incentive for participation in the shadow economy will increase (Schneider and Buehn, 2017). Therefore, we expect the size of the shadow economy to increase as the variable increases.

Tax morale: The intrinsic incentive for paying tax and participating in compensating for public expenditures is called the tax morale (Trugler, 2007). The intrinsic incentive for paying taxes and for complying with the law are important factors for tax compliance. Therefore, one reason why lower-income countries have lower levels of taxation may be the weaker morale of taxpayers, who have grown in high-income countries. Schneider (2010) shows the negative effect of the tax morale on the shadow economy. In this study, we also expect the increase in tax morale to have a negative effect on the shadow economy.

Tax fairness: it measures the way of distribution of tax burden derived from government tax policies (Richardson, 2006). Another component of tax fairness can be related to the one's perception of justice in the tax system, and by improving this index of the tax system, we expect the size of the shadow economy to decrease.

Tax complexity: The tax system is increasingly involved over time in a large number of developed countries; complexity is an important tax evasion factor (Richardson & Sawyer, 2001). In Iran, vagueness of laws and regulations, the inefficiency of administrative structures, excessive involvement of government in economic affairs and government monopolies, along with misinterpretations, provides the ground of transferring more people from formal to informal economy.

Factors such as the Dummy variables of war and revolution and the targeting of subsidies as factors affecting the shadow economy, although as main variables, are not included in the model due to software constraints, they are used frequently in the model, and each has a significant effect on the shadow economy in Iran and maintained in the model.

2.1.2 The Indicators of Shadow Economy

With regard to the indicators of shadow economy, we refer to three important variables used in this study.

Energy consumption: Increasing the size of the shadow economy, ceteris paribus, means an increase in energy consumption as a necessary input for this sector of the economy (Arab Mazar Yazdi, 2001). Thus, we expect to see the interaction between these two variables.

Household expenditures: Households tends to hide their incomes more than their expenditures. We expect that with the growth of the size of the shadow economy, per capita consumption to increase (Arab Mazar Yazdi, 2001).

Money demand: Many studies conducted in Iran and other countries to measure the shadow economy using the monetary method is on the assumption that economic and illegal activities agents prefer to do their transactions with cash (Sameti et al., 2009). Accordingly, it is expected that as the size of the shadow economy increases, the proportion of money in circulation to increase.

2.2 Review of Literature
In this section, we briefly review the empirical studies on the tax evasion, shadow economy, and factors affecting them.

Riahi-Belkaoui (2004) examines tax evasion factors on a sample of 30 developed and developing countries in 1996. To measure tax evasion, he uses the direct approach and finds that the high level of economic freedom, importance of equity markets and the effectiveness of competition lows are positively associated with tax compliance, while high level of crime reduces the level of tax compliance.

Richardson (2006) examined the causes of tax evasion on selected 45 countries of the world in a cross-sectional study. The results show that the complexity of tax laws increases the level of tax evasion, while high levels of general education, services income sources, tax fairness, and tax morale reduce it.

Dell'Ano (2009) argues that one of the factors affecting tax evasion is the tax morale, which depends on the intrinsic incentive of taxpayer for tax evasion. His method is to use the total tax evasion model. He conducted his research on selected Latin American countries and used

data of 1999, and the results confirm the effect of tax morale on tax payment or tax evasion.

Schneider (2010) estimates the size of the shadow economy of the 21 OECD countries, using the MIMIC model. The results show that burden of taxation and social security payments, labor market regulation, quality of state institutions and tax morale are the driving forces for the shadow economy.

Karimi Petanlar et al. (2011) estimated the size of tax evasion in Iran's economy. For this purpose, at first, they calculated the size of the shadow economy using the currency demand method, then, by considering effective tax rate; they measured the amount of the underground economy taxes. The results of this study showed that the size of the underground economy and tax evasion are increasing during the study period (1971-2007).

Schneider et al. (2015) examine the size of the shadow economy in 31 European countries in 2014 and 28 countries which are the member of EU during the period 2003-2014 and estimate the tax evasion. The shadow economy is estimated for all countries using MIMIC method. The research results show that the average size of the shadow economy in the 28 EU countries has fallen from 22.6% in 2003 to 18.6% (of official GDP) in 2014. The most important deriving forces of the shadow economy are with 14.6 per cent unemployment and self-employment, and the tax morale with 14.5 per cent. The proportion of tax evasion was on average 4.2 per cent (of official GDP) in Poland and 2.9 percent in the Czech Republic.

Schneider and Boehn (2017) pursue three goals in their study: First, they show that there is no single infallible method for estimating the size of the shadow economy, and the results can differ significantly between different approaches. Second, they define the shadow economy and explain the factors making it grow. Finally, estimates of the size of the shadow economy of 143 countries during the period 1996 to 2014 are presented.

Arazb Mazar Yazdi (2001) estimates the volume of black economy in Iran using the MIMIC model during the period 1968-1998. The result shows that among the causes involved in the emergence of the black economy in Iran, the variables of per capita income and the index of economic openness have a higher relative value.

Sameti et al. (2009) also estimate the size of the underground

economy in Iran using the MIMIC model. The results of the estimation of the selected model show that unemployment, business constraints, inflation, tax burden, income derived from natural resources and government size were among the factors affecting this phenomenon in Iran.

Amin Khaki (2012) estimates the tax evasion using monetary method and legal potential capacity for the informal and formal sector and its determinants during the period 1959-2008. The results indicate that the estimated tax evasion in the formal sector, informal sector and the total has increasing trend during the studied period. The variables of tax morale, tax fairness, and literacy rate have negative effect on tax evasion, while tax burden, tax complexity, and gender have a positive effect on tax evasion.

Hadiani and Tahvili (2013) identify the factors affecting tax evasion in the Iranian economy using the ARDL model during the period 1971-2007. The results show that tax rate, the complexity of laws and regulations, lack of social capital, and inflation have a positive and significant relationship with tax evasion in the long term.

Abounoori and Nikpour (2014) examine the effect of tax burden indicators on the size of Iran's hidden economy over the period of 1966-2011. The size of the hidden economy was calculated using MIMIC model. The results show that tax burden, government size and business constraints are the main factors involved in the emergence of hidden economy in Iran.

In the current research, MIMIC model is used to examine the effect of variables of financial discipline and behavioral factors on the size of the shadow economy and tax evasion caused by it. It considers various factors for estimating the shadow economy, and then, it estimates the tax evasion caused by shadow economy. No study has been conducted so far on the shadow economy and tax evasion in Iran's economy.

3. Methodology
3.1 MIMIC Model
The MIMIC model tests the relationship between the latent variable of "size of shadow economy" and the observable variables through the relationships between the observable variables, by using their

information of covariance. The observable variables are grouped within the causes and indicators of the latent variable. The MIMIC model includes two parts: a structural equation model and a measurement model (Schneider and Boehn, 2017).

The measurement equation is as follows:

$$y_t = \lambda \eta_t + \varepsilon_t \tag{1}$$

Where, $\acute{y}_t = (y1_t, y2_t, \ldots, yp_t)'$ is a vector of indicators and η_t is unobservable variable.

Structural model determines unobservable variable η_t with a set of exogenous causes, $\acute{x}_t = (x1_t, x2_t, \ldots, xq_t)'$ and subject to a structural disturbance error term ς_t. The structural equation is given by:

$$\eta_t = \acute{\gamma} x_t + \varsigma_t \tag{2}$$

Substituting 1 into 2 yields a reduced form equation, which states the relationships between observed causes and indicators.

$$y_t = \Pi x_t + z_t \tag{3}$$

Where $\pi = \lambda \acute{y}$ is reduced form coefficient matrix and $z_t = \lambda \varsigma_t + \varepsilon_t$ is the reduced form vector of a linear transformation of disturbances which reduced form covariance matrix Ω is determined as follows:

$$\Omega = cov(z_t) = E\big[(\lambda \varsigma_t + \varepsilon_t)(\lambda \varsigma_t + \varepsilon_t)'\big] = \lambda \psi \acute{\lambda} + \Theta_\varepsilon \tag{4}$$

In equation (4), $\psi = Var(\varsigma_t)$ represents ς_t variance and $\Theta_t = E(\varepsilon_t \acute{\varepsilon}_t)$ is the measurement error's covariance matrix.

3.2 Model Specification
3.2.1 Shadow Economy Model Specification
Based on MIMIC model, described in the previous section, the size of the shadow economy is estimated by considering the variables of financial discipline and behavioral factors for the Iranian economy for the period of 1967-2015. Based on theoretical principles and the use of variables of different causes and effects, the following final model is used to estimate the shadow economy index.

$$lcp = \lambda_1 SE + \varepsilon_1 \tag{5}$$

$$le = \lambda_2 SE + \varepsilon_2 \tag{6}$$

$$lrh_2 = \lambda_3 SE + \varepsilon_3 \tag{7}$$

$$SE = \gamma_1 lun + \gamma_2 ltbimp + \gamma_3 inf + \gamma_4 bd + \gamma_5 ltaxmorale + \gamma_6 taxfair + \varsigma \tag{8}$$

Where lcp is the logarithm of household expenditures, le is the logarithm of energy consumption, lrh2 is the logarithm of liquidity volume growth, SE is the shadow economy index, ltbimp is the logarithm of tax burden on imports, lun is the logarithm of unemployment rate, inf is the inflation rate, bd is the budget deficit, ltaxmorale is the logarithm of tax morale and taxfair is the tax fairness.

The model is estimated using Stata software and maximum likelihood method. In selecting the final model of the shadow economy index measurement, two criteria are considered. The first criterion, used by Frey & Weck_Hannemann (1984) is adaptation of the parameters to the theoretical prediction and their significance, and the second criterion, used by Giles (1999), puts more emphasis on the model fit. In this study, we first select models providing an acceptable index of underground economy, and then, a model that has better general fit criterion is selected among them. The general fit and comparative fit criteria of the model are summarized in Table (1).

Table 1: General and Comparative Fit Criteria of Model

Fit Criterion	Type of Statistics	Application	Desired Values
General fit of model	Chi-square	Determining the closeness of estimated model to statistical population data	As it is smaller and its error is above 0.05
	RMSEA[1]	Goodness of fit index	When it is less than 0.05, model has the fit of good. When it is between 0.05 and 0.08, the fit is acceptable, and if it is between 0.08 and 0.1, the fit is moderate and when it is larger than 0.1, the fit is poor (Kalantari, 2013).

1. Root Mean of square Error of Approximation

Fit Criterion	Type of Statistics	Application	Desired Values
	Comparative fit index (CFI)	Goodness of fit index	As it is closer to number 1
	Tucker-Lewis Index (TLI)	Goodness of fit index	As it is closer to number 1
	SRMR[1]	Goodness of fit index	Less than 0.05
	AIC[2]	To compare the models	As smaller
Comparative fit of model	BIC[3]	To compare the models	As smaller
	CD[4]	Coefficient of determination for explanatory power of the models	Over 0.75

3.2.2 Estimation of Tax Evasion from Estimated Shadow Economy Size

In the second step, using the calibration method from the rank numbers, the relative index of the shadow economy (of official GDP) is derived, and the absolute size is obtained by multiplying it in GDP. Then, tax evasion (TE) is estimated using the formula below.

$$\text{tax avasion (TE)} = SE * \left(\frac{\text{total taxes}}{\text{GNP}} \right) \tag{9}$$

Where SE is shadow economy and GNP is gross national production.

3.3 Variables and Data

In Table (2), the variables of the causes and indicators used in different models of research and their calculation method are presented in summary. All data used in this research were collected from balance sheets, national accounts of Central Bank of Iran, Management and Planning Organization of Iran, budget bill of years 1966- 1970, the study conducted by Amin Khaki (2012), and Iran's Ministry of Energy.

Table 2: Introduction of Variables and Their Indices

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1. Standardized root mean squared residual
2. Akaike Info Criterion
3. Schwarz Info criterion
4. in the Stata software R2 represented with CD

Variable	Index	Index Definition	Unit
Tax burden (tb)	Total tax Burden (ttb)	Total ratio of tax income to GDP multiplied in 100	Percentage
	Tax burden on imports (tbimp)	Ratio of tax on imports to imports of goods and services multiplied in 100	Percentage
Income derived from natural resources (ni)	Incomes derived from export of oil and gas (ni)	Incomes derived from export of oil and gas to GDP multiplied in 100	Percentage
Unemployment (un)	Unemployment rate (un)	The ratio of unemployed people to economically active population multiplied in 100	Percentage
Per capita income (ci)	Per capita income growth (rci)	Per capita income growth	Percentage
Inflation (inf)	Inflation rate (inf)	Inflation rate announced by Central Bank	Percentage
Budget deficit (bd)	Budget deficit (bd)	Budget deficit in Milliard Rials (with constant price of 2004)	Milliard Rials
Tax morale (Taxmorale)	Social expenditures per capita (Taxmorale)	Social welfare expenditures per capita (with constant price of 2004)	Thousands Rials
Tax fairness (Taxfair)	Tax fairness (Taxfair)	The ratio of tax changes by wages to changes in tax by income of jobs	
Household expenditures (cp)	Per capita consumption (cp)	Per capita expenditures of Iran's households (with constant price of 2004)	Million Rials
Energy consumption (e)	Energy consumption (e)	Final consumption of energy	Million barrels of crude oil
Money demand (h)	Money demand-1 (h1)	Money volume	Milliard Rials
	Growth of money demand-2 (rh2)	Liquidity volume growth	Percentage

Source: Researcher calculations and different statistical sources

4. Empirical Results
4.1 Time Series Test
Modeling of time series is based on the assumption of the stability of variables. If the variables used in the model are not stable, the estimation might lead to a false regression. To test the stability of variables in this study, Zivot-Andrews test is used to show the structural break point. The results are presented in Table (3).

Table 3: Results of Unit Root and Structural Break Tests

Variable	Structural Break Point	t-statistic	Critical Value 5%	Number of Lag	Result
lttb	1990	-7.76	-4.8	0	I(1)
ltbimp	1989	-8.4	-4.8	0	I(1)
lni	1982	-7.04	-4.8	1	I(1)
lun	1997	-7.1	-4.8	0	I(1)
rci	1977	-5.3	-4.8	0	I(0)
inf	1996	-8.1	-4.8	1	I(1)
bd	2002	-7.4	-4.8	0	I(1)
ltaxmorale	1974	-6.5	-4.8	0	I(0)
taxfair	1977	-7.11	-4.8	0	I(0)
lcp	1976	-5.73	-4.8	0	I(1)
le	1978	-8.1	-4.8	0	I(1)
lh1	1993	-9.2	-4.8	0	I(1)
lrh2	1986	-4.8	-4.8	0	I(0)

Source: Research Findings

Based on the above Table, the variables of per capita income growth, tax morale, tax fairness, and the growth of liquidity volume are stable at their level and the rest are stable at their first difference. Therefore, it is necessary to use co-integration tests. The Johansen-Juselius test is used to examine the long-term relationship between the variables.

The results of the maximal eigenvalues and trace test statistics presented in Table 4 reveal that at least two cointegrating vectors exits among the variables of interest.

Table 4: Results of the Johansen-Juselius Test for the Final Selected Model of Shadow Economy

The Number of Convergence Vector	Trace Statistic	Critical Value	Maximum Eigenvalue Statistic	Critical Value
0	252.4	192.9	77	57.1
1	175.4	156	54.2	51.4
2	121.2*	124.2	38.9*	45.3
3	82.3	94.1	26.5	39.4
4	55.7	68.5	21.4	33.5

Source: Research Findings

4.2 The Estimations for Different Models of Shadow Economy

Before examining the results of the better models, it is necessary to mention a few points about model estimation.

1- Different variables were introduced for variables of causes and indicators, and the variables that are included in the final models of the shadow economy are mentioned in the causes and indicators section. Apart from the variables mentioned in the causes and indicators section, the trade restriction variable in the causes section and the economic growth variable in the indicators section were used in the initial models, because of the negative effect on the general fit of the model, in the structural equations adjustment section were excluded from the final models of shadow economy. In addition, although two variables of government size and tax complexity were among six variables of financial discipline and behavioral factors, the final models of the shadow economy were eliminated because they were not significant in any of the selected models and had a problem with the general fit of the model. The two dummy variables of targeting of subsidies (s) and war and revolution (wr) were also introduced in different models. Due to the negative effect of the war and revolution on the general fit of the model and the significance of the variables, it was eliminated in the final models of the shadow economy.

2- For the money demand index, various variables were introduced into the model, but with indicators of money demand-1 (h1) and growth of money demand-2 (rh2), better models were fitted. As a result, in the final selection models, for estimating the shadow economy, the money volume and the growth of liquidity volume have been used as a variable reflecting shadow economy effects on the money market.

3- The structural equation system used in this research faces with problem of identifying, which to solve the problem, one of indicators is limited to pre-determined value (equivalent to one). In this case, the unique estimation of the parameters will be possible. However, estimated values for each parameter cannot be interpreted in absolute terms, but interpreted relatively (in comparison to the estimation of other parameters). For easier interpretation of the results, the standardized figures are shown in the table. However, before the

standardization for the first and second models of the household expenditure variable, for the third, fourth, fifth, sixth and seventh models, we consider the energy consumption variable and for the eighth model, the variable of money demand-1 (money volume) is equal to fixed value of one.

As the goal is specifying an appropriate model of data in the framework of the structural equation modeling, several models of variables used in the research have been designed and estimated during the period between 1967 and 2015. Table 5 presents eight different specifications of the shadow economy, considering the variables of financial discipline and behavioral factors by using the variables of causes and indicators, general and comparative fit criteria of different models.

The following points are noteworthy for the various specifications.

1- Effect of tax burden, tax burden on imports and unemployment rate variables are positive and significant in various specifications, and their coefficients are consistent with theoretical predictions.

2- The effect of tax morale variable on the shadow economy is positive and significant in all models. The effect of this variable is greater than the other variables entered in different models. This reflects the low tax morale in Iran.

3- Negative and significant effect of the variable of income derived from natural resources on the shadow economy in three models are consistent with the result of the Fotros and Dalaei Milan's study in 2016. Accordingly, positive shock for oil revenues increased official production and reduced underground economy and consequently reduced tax evasion and increased revenue for the government. However, in spite of the negative effect of income derived from natural resources on the shadow economy, according to Rahbar and Salimi (2015), in Iran, the government often increases its level of spending in the economy supported by oil revenues and This increase can be beneficial in short run, but in the long run it reduces welfare, which has a negative effect on the behavior of taxpayers. This is evident with the positive effect of the tax morale on the underground economy in all selected models.

4- Impact of income growth variable was investigated on three models of selected models. The positive and significant effect of this

variable on the shadow economy in the two models indicates that the low level of per capita income in Iran makes people resort to illegal businesses to offset their income deficit.

5- The effect of the presence of inflation rate and budget deficit variables on the shadow economy in all selected models is positive and significant. This suggests that the government's lack of financial discipline increases the size of Iran's shadow economy.

6- The results of the model estimation show the negative and significant effect of the tax fairness variable on the shadow economy in three models of selected models.

7- Among the factors of the emergence of shadow economy in Iran, variables of tax morale, tax burden, tax burden on import, unemployment rate and inflation rate are higher.

8- The variable of household expenditure in all models, and the energy consumption variable in seven models, are as indicator variables and are statistically significant. The variable of money volume is entered in a model and is statistically significant. The growth of liquidity volume variable has been entered in a model, but it is statistically meaningless.

9- Based on the results of Table 5 and based on the goodness of fit indices, the RMSEA has a good correlation of 0.08 in the first model and it is a good model in terms of fit indices and significance of variables and match of parameters signs with theoretical principles. Thus, the first model is considered as an appropriate model for estimating shadow economy.

Table 5: Estimation of Different Specifications of the Main Model

	M1	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**
Causes								
lttb	…	…	…	…	…	0.3^{**}	0.4^{**}	0.38^{**}
ltbimp	0.38^{**}	0.23^{**}	0.34^{**}	0.32^{**}	0.39^{**}	…	…	…
lni	…	…	-0.1^{**}	-0.17^{**}	…	-0.16^{**}	…	…
lun	0.24^{**}	…	0.2^{**}	0.22^{**}	0.25^{**}	0.1^{**}	0.13^{**}	0.11^{**}
rci	…	…	…	0.1^{**}	0.05	…	0.1^{*}	…
inf	0.2^{**}	0.15^{**}	0.17^{**}	0.2^{**}	0.23^{**}	0.1^{*}	0.17^{**}	0.1^{**}
bd	0.15^{**}	0.2^{**}	0.1^{**}	0.1^{**}	0.15^{**}	0.2^{**}	0.2^{**}	0.2^{**}

	M1	M2	M3	M4	M5	M6	M7	M8
ltaxmorale	0.6**	0.7**	0.6**	0.57**	0.63**	0.4**	0.4**	0.4**
taxfair	-0.06*	-0.01	-0.04	-0.07*	-0.08**	0.006	-0.05	-0.02
S indicators	…	0.1**	…	…	…	…	…	…
lcp	0.97**	0.98**	0.97**	0.96**	0.97**	0.98**	0.98**	0.99**
le	0.94**	0.93**	0.94**	0.95**	0.94**	0.93**	0.93**	…
lh1	…	…	…	…	…	…	…	0.91**
lrh2	0.14	…	…	…	…	…	…	…
Goodness of fit indices								
chi-square	16.6	16.8	10.7	12.8	12.3	12.5	12.6	9.15
prob	0.16	0.16	0.1	0.08	0.05	0.05	0.05	0.1
RMSEA	0.08	0.09	0.13	0.13	0.15	0.15	0.15	0.13
CFI	0.98	0.97	0.98	0.97	0.97	0.97	0.97	0.98
TLI	0.96	0.96	0.95	0.94	0.93	0.92	0.92	0.94
SRMR	0.04	0.04	0.02	0.02	0.02	0.02	0.02	0.02
AIC	1895.2	2002.7	1870.4	2187.5	2176	1839.7	2143	1943.7
BIC	1923.6	2031	1895	2214	2200.6	1864.3	2167.6	1966.5
CD	0.98	0.96	0.99	0.99	0.99	0.95	0.95	0.94

Source: Research Findings
Note: ** Significance at 95% level and * Significance at 90% level.

4.3 Results of the Final Model Estimation
4.3.1 The Results of the Shadow Economy
The results of the final model of Iran's shadow economy are presented in Table (6).

Table 6: Results Derived from Estimating the Final Model of Shadow Economy

Variable	Index Definition	Coefficient	Z Statistic	Prob	Result	Type of Relationship
ltbimp	Tax burden on imports	0.38	7.6	0	Not rejected	Positive and significant
lun	Unemployment rate	0.24	5.3	0	Not rejected	Positive and significant
inf	Inflation rate	0.2	4.6	0	Not rejected	Positive and significant

Variable	Index Definition	Coefficient	Z Statistic	Prob	Result	Type of Relationship
bd	Budget deficit	0.15	3	0.002	Not rejected	Positive and significant
ltaxmorale	Tax morale	0.6	14.4	0	Not rejected	Positive and significant
taxfair	Tax fairness	-0.06	-1.7	0.09	Not rejected	negative and significant
lcp	Household expenditures	0.97	93.9	0	Not rejected	Positive and significant
le	Energy consumption	0.94	66.5	0	Not rejected	Positive and significant
lrh2	Growth of liquidity volume	0.14	1.05	0.3	Reject	Non-significant

Source: Research Findings

Regarding the presented results in table 6, the following points can be stated:

1-The effects of the tax burden on imports, unemployment rate, inflation rate, and budget deficit and tax morale on the index of the shadow economy are positive. Therefore, the increases in these variables will increase the size of the shadow economy and vice versa.

2- Among the variables of financial discipline and behavioral factors, the impact of the tax morale on the shadow economy is three times more than the impact of the inflation rate and four times more than the impact of the budget deficit on the shadow economy. This indicates the importance of behavioral factors on the size of the shadow economy in Iran.

3- The effect of the tax fairness variable on the index of the shadow economy is negative and at 90% is significant. Therefore, with the increase of the tax fairness variable, the size of the shadow economy decreases, and vice versa.

4-The coefficients of household expenditure and energy consumption indexes as of the influenced variables by the shadow economy are positive. Therefore, increasing the size of the shadow economy will increase household expenditures and energy consumption, and vice versa.

5- The coefficient of liquidity volume growth is non-significant. Therefore, the increase and reduction of shadow economy do not affect the liquidity volume growth statistically significantly.

6- Amin khaki (2012), in his study, estimates the tax evasion by using the monetary method and the potential legal approach for the informal and formal economy during the years 1959-2008. Also, in his research, the factors influencing tax evasion are studied, according to Jackson and Millon (1986) variables and indicators such as tax fairness, tax ambiguity and complexity, and tax morale are used for behavioral factors; that present study uses these variables and the indices considered by Amin Khaki for behavioral factors. The results of the research showed that fairness and tax morale variables had negative effects on tax evasion and the tax complexity variable had a positive effect on tax evasion. The difference between the present study and Amin khaki's study is that in this study, behavioral factors as factors affecting the shadow economy are included in the model and the size of the shadow economy is estimated by the MIMIC method, and then the tax evasion caused by it is estimated. While the Amin Khaki's study, shadow economy is estimated by monetary method, then, in a regression model, the effect of various factors is investigated on tax evasion caused by the shadow economy.

4.3.2 Estimation of the Size of the Shadow Economy and Tax Evasion
Estimated values of the shadow economy index by software are ranked numbers. The calibration method is used to calculate the relative size of the shadow economy. Therefore, the results of the four studies listed in Table (7) are used. The reason for the selection of year 2001 is that it is available in all the selected studies.

Table 7: Relative Size of Shadow Economy in Iran in 2001 in Different Studies

Researcher Name	Estimation Method	Estimated Values for 2001 (Percentage of Official GDP)
Ebrahimi Dastgerdi (2007)	MIMIC model	20.77
Sameti et al. (2009)	MIMIC model	27.76
Alizadeh and Ghaffari (2013)	Exploratory factor analysis	26.5
Abounoori and Nikpour (2014)	MIMIC model	51.85
average		31.725

Source: Studies inserted in the left side of column

The average relative size of the shadow economy in 2001 for four existing studies is 31.725. The average value is divided by shadow economy index of 2001 in this study and then the number (9.37) obtained is multiplied in the shadow economy index in other years, and the relative values of the shadow economy are obtained in different years (as a percentage of official GDP). The absolute size of the shadow economy of each year is also obtained by multiplying the relative values of the shadow economy in GDP in the same year and the value of tax evasion of each year is also derived from multiplying the absolute size of the shadow economy (in Milliard Rials) in ratio of total tax to gross national product (GNP).

Figure (1) shows the relative size of the shadow economy (SE1) during the period of 1967-2015. According to the figure, the average relative size of the shadow economy during the period is 29.7. Its maximum value is in 2008 with 34.7 and the minimum value is in 1970 with 22.03. Figure (2) shows the absolute size of the shadow economy (SE2) over the period 1967-2015. According to the figure, the average absolute size of the shadow economy during the period is 367790.3 Milliard Rials, the maximum absolute value of the shadow economy is in 2011 with 725999.9 Milliard Rials and its minimum value is in 1967 with 111393 Milliard Rials.

Figure (3) shows the value of tax evasion (TE) during the period 1967-2015. According to the figure, the average tax evasion during this period is 18478.3 Milliard Rials. The maximum value is in 2009 with 48040.2 Milliard Rials and the minimum value is in 1967 with 4928.3 Milliard Rials.

Given the values of relative size and absolute size of the shadow economy and tax evasion, the average relative size of the shadow economy during the period 1967-1978 is 26.1% and has increased to 28.9% during the period 1979-1988, which this increase could be due to the occurrence of the war and revolution, increased budget deficit, unemployment and inflation, which will increase the work of the informal sector and the size of the shadow economy. During the period of 1989-1996, the average relative size of the shadow economy reached to 29.2%, which the factors of exchange rate fluctuations, increase in government expenditures due to reconstruction of war devastation and increase in budget deficits, and increase in inflation rate were involved in increase in shadow economy size.

During the period 1997-2004, the relative size of the shadow economy reached 31.2%, which the main reasons included increased rate of unemployment and reduction in oil prices due to the South East Asia crisis, resulting in a reduction in government income and an increase in budget deficit. During the period from 2005-2015, the average relative size of the shadow economy reached 33.6 percent, which the main reasons for its increase were the entry of the population of the 80s births into the labor market and increased rate of unemployment, increased economic sanctions led to exchange rate fluctuations, reduction in oil incomes, and an increase in government deficit, lack of government discipline and printing of money to offset the budget deficit, led to an increase in the volume of liquidity and intensified inflation.

The absolute size of the shadow economy, like the relative size of the shadow economy, has changed during the studied period, and the tax evasion process is only different in the first two periods. During the period 1967 to 1978, the average tax evasion was 9314.7 Milliard Rials and during the period 1979-1988, the average tax evasion rate decreased to 8843.8 Milliard Rials. This decrease could be due to the fact that during the war and revolution, the level of manufacturing activities decreased compared to that in previous period. As a result, the ratio of tax to gross national product decreased. Thus, while the average size of the relative and absolute shadow economy increased in the considered period compared to that in previous period, but tax evasion decreased.
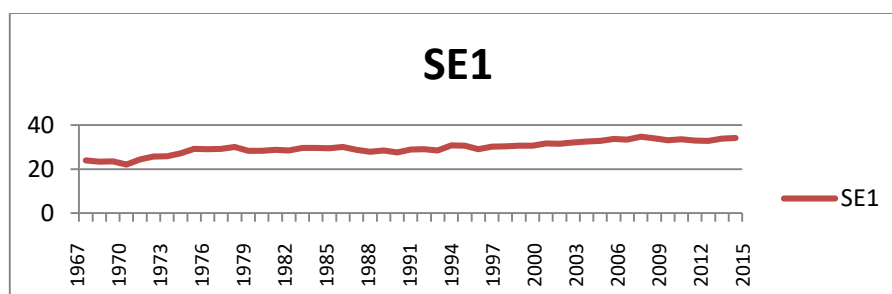

Figure 1: Relative Size of the Shadow Economy by Considering Financial Discipline and Behavioral Factors during the Period (1967-2015)
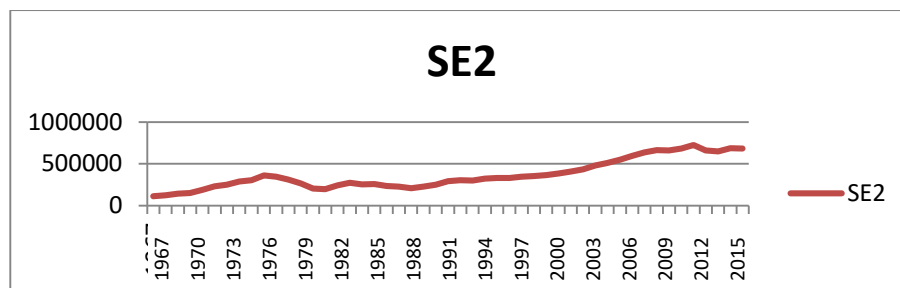**Source**: Research Findings

Figure 2: The Absolute Size of the Shadow Economy by Considering Financial Discipline and Behavioral Factors during the Period (1967-2015)
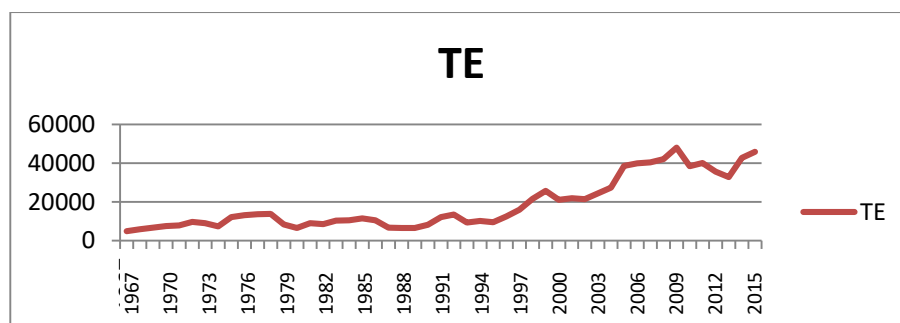**Source**: Research Findings

Figure 3: Value of Tax Evasion during the Period 1967-2015
Source: Research Findings

5. Conclusions

In this study, the shadow economy and its tax evasion were estimated using the variables of financial discipline and behavioral factors during the period of 1967-2015. In order to examine the effect of the government's financial discipline, three variables of inflation rate, government size, and budget deficit were considered, and for behavioral factors, three variables of tax morale, tax fairness, and tax complexity were applied. For this purpose, eight models were estimated using MIMIC model and Maximum Likelihood method. Among them, the best model was selected.

According to research results, the variable of tax morale has a positive effect on the shadow economy and its effect is much more than the variables of budget deficit and inflation rate. The impact of tax morale on shadow economy and the tax evasion caused by it is three times more than the impact of inflation rate and four times more than the impact of budget deficit. The two variables of government

size and the tax complexity were not included in the model due to the model constraint. Given these results, the effect of behavioral factors on the shadow economy and tax evasion caused by it, is more than the effect of financial discipline.

According to the results, the tax burden on imports, unemployment rate, inflation rate, budget deficit, and tax morale have a positive effect on the shadow economy index, which tax morale and tax burden on imports have the largest impact on the shadow economy index. Contrary to developed countries, the tax morale increases the size of the shadow economy and tax evasion caused by it. In other hand, given the above explanations, behavioral factors affect the shadow economy more than government financial discipline. However, it can be stated that the observance of government's financial discipline, lack of budget deficit and economic stability, and the reduction of inflation rate are very influential on public trust to government authorities and tax compliance. Moreover, the tax fairness variable decreases the shadow economy index, but its effect is significant at 90% level and its effect is small. Moreover, according to the findings the effect of shadow economy on the energy consumption and household expenditures is positive, while its effect on household expenditures index is stronger.

Based on the research results, tax compliance in Iran is low, and some factors such as transparency and accountability, compliance with government's financial discipline, economic stability, and the reduction of inflation fluctuations have a higher role in increasing tax morale and increasing taxpayer compliance. From psychological perspective, economic stability and the reduction of inflationary fluctuations also play a major role in tax compliance. Therefore, observance of financial discipline has a great impact on tax compliance and behavioral factors. As tax fairness reduces the shadow economy and tax evasion caused by it, but its effect is small, a gradual increase in tax burden can leave positive effect on taxpayers' attitude towards fairness in the tax system. It also causes more effect of tax fairness on reduction in size of shadow economy and tax evasion caused by it. As unemployment rate is one of the main causes of shadow economy, the strengthening of the private sector and the necessity of increasing job opportunities in this sector is being felt

since by increasing employment rate, the shadow economy size and tax evasion caused by it are reduced.

References

Abounoori, E., & Nikpour, A. (2014). The Effect of Tax Burden Indicators on the Size of the Hidden Economy in Iran. *Quarterly Journal of Economic Growth and Development Research*, *5*(17), 75-90.

Acemoglu, D. (2005). Politics and Economics in Weak and Strong States. *Journal of Monetary Economics*, *52*, 199-226.

Alizadeh, H., & Ghaffari, F. (2013). Estimating the Size of Underground Economy in Iran and Studying the Factors Affecting it. *FED Journal*, *7*(25), 31-69.

Allingham, M., & Sandmo, A. (1972). Income Tax Evasion: A Theoretical Analysis. *Journal of Public Economics*, *1*(3-4), 323-338.

Amin Khaki, A. (2012). *Estimating Tax Evasion and its Determinants in the Iranian Economy* (Doctoral Dissertation, University of Mazandaran, Iran). Retrieved from https://irandoc.ac.ir/.

Arab Mazar Yazdi, A. (2001a). *Black Economy in Iran, one Macroeconomic Approach* (Unpublished Doctoral Dissertation). Allameh Tabataba'i University, Iran.

---------- (2001b). Black Economy in Iran, Size, Causes and Effects of the Past Three Decades. *Planning and Budget Quarterly*, *6*(62-63), 3-60.

Dell'Ano, R. (2009). Tax Evasion, Tax Morale and Policy Maker's Effectiveness. *The Journal of Socio-Economics*, *38*, 988-997.

Devos, K. (2014). *Factors Influencing Individual Taxpayer Compliance Behavior*. Dordrecht: Springer Publisher.

Ebrahimi Dastgerdi, F. (2007). *An Inquiry and Measurement of Tax*

Evasion and Underground Economy in Iran (Unpublished Master's Thesis). Islamic Azad University, Khorasegan Branch, Iran.

Feige, E. L. (1989). *The Underground Economies, Tax Evasion and Information Distortion*. Cambridge: Cambridge University Press.

Fotros, M., & Dalaei Milan, A. (2016). Examining of Underground Economy and Tax Evasion within the Framework of Dynamic Stochastic General Equilibrium Models (DSGE). *Quarterly Journal of Economic Growth and Development Research*, *7*(25), 65-84.

Frey, B. S., & Weck-Hannemann, H. (1984). The Hidden Economy as an Unobserved Variable. *European Economic Review*, *26*(1), 33-53.

Gemmel, N., & Hasseldine, J. (2012). The tax Gap: A Methodological Review. *Advances in Taxation*, *20*, 203-231.

Gërxhani, K. (2004). The Informal Sector in Developed and Less Developed Countries: A Literature Survey. *Public Choice*, *120*(3-4), 267-300.

Giles, D. E. A. (1999). Modeling the Hidden Economy and the tax-gap in New Zealand. *Empirical Economics*, *24*, 627-640.

Hadian, E., & Tahvili, A. (2013). Tax Evasion and its Determinants in the Iranian Economy. *The Journal of Planning and Budgeting*, *18*(2), 39-58.

Jackson, B., & Milliron, V. (1986). Tax Compliance Research: Findings, Problems, and Prospects. *Journal of Accounting Literature*, *5*, 125-165.

Kalantari, Kh. (2013). *Structural Equation Modeling in Socio-Economic Research (with LISREL and SIMPLIS software)* (2nd Ed.). Tehran: Farhang Saba Press.

Karimi Petanlar, S., Gilak, M. T., Jafari Samimi, A., & AminKhaki, A. (2011). An Estimation of Tax Evasion in Iran. *Journal of*

Economics and Behavioral Studies, 3(1), 8-12.

LaPorta, R., & Sheleifer. A. (2008). The Unofficial Economy and Economic Development. *Brookings Papers on Economic Activity*, 2, 275-352.

Murphy, R. (2011). Collect the Evaded Tax, Avoid the cuts. *The Guardian*, November25, Retrieved from https://www.theguardian.com.

Raczkowski, K. (2014). Intellectual Capital Management in Tax Administration and Country's Economic Growth Determined by Competitive Taxation (45-61). In K. Raczkowski, and L. Sulkowski (Eds.), *Tax Management and Tax Evasion*, Frankfurt: Peter Lang.

Rahbar, F., & Salimi, E. (2015). The Role of Fiscal Discipline and National Development Fund in Reducing Dutch Disease Effects in the Iranian Economy. *Applied Economics Studies in Iran*, *4*(14), 219-243.

Riahi-Belkaoui, A. (2004). Relationship between Tax Compliance Internationally and Selected Determinants of Tax Morale. *Journal of International Accounting*, *Auditing and Taxation*, *13*, 135-143.

Richardson, G. (2006). Determinants of Tax Evasion: A Cross-Country Investigation. *Journal of International Accounting*, *Auditing and Taxation*, *15*, 150-169.

Richardson, G., & Sawyer, A. J. (2001). A Taxonomy of the tax Compliance Literature: Further Findings, Problems and Prospects. *Australian Tax Forum*, *16*, 137-320.

Sameti, M., Sameti, M., & Dalaei Milan, A. (2009). Estimation of Underground Economics in Iran with MIMIC Method. *International Economic Studies*, *20*(2), 89-114.

Schneider, F. (2012). The Shadow Economy and Work in the Shadow: What do We (not) Know? *Discussion paper*, *6423*, Retrieved from http://ftp.iza.org/dp6423.pdf.

----------- (2010). The Influence of Public Institutions on the Shadow Economies: an Empirical Investigation for OECD Countries. *Review of Law and Economics*, *6*(3), 441-468.

---------- (2007). Shadow Economies and Corruption all over the World: New Estimates for 145 Countries. *Open-Assessment E-Journal (Version 2)*, Retrieved from https://www.researchgate.net/publication/23755510_Shadow_Econom ies_and_Corruption_All_Over_the_World_New_Estimates_for_145_ Countries/link/0912f50ad59fe058f6000000/download.

---------- (2005). Shadow Economies around the World: What do We Really Know? *European Journal of Political Economy*, *21*(3), 598-642.

---------- (2004). The Size of the Shadow Economies of 145 Countries all Over the World: Firs Results over the Period 1999-2003. *IZA Discussion, 143,* Retrieved from https://pdfs.semanticscholar.org/6d89/dad46b561c34f3265b389abe33 cb6b8a3767.pdf.

Schneider, F., & Buehn, A. (2017). Shadow Economy: Estimation Methods, Problems, Results and Open Questions. *Open Economics, 2017*, 1-29.

Schneider, F., & Eneste, D. H. (2000). Shadow Economies: Size, Causes and Consequences. *Journal of Economic Literature*, *38*(1), 77-114.

Schneider, F., Raczkowski, K., & Mróz, B. (2015). Shadow Economy and Tax Evasion in the EU. *Journal of Money Laundering Control*, *18*(1), 34-51.

Schneider, F., & Williams, C. C. (2013). *The Shadow Economy*. London: The Institute of Economic Affairs.

Shaghaghi, S. (2006). Financial Discipline, Reduce in Costs and Increase in Resources Efficiency. *Economic Program Magazine, 192*, 16-18.

Stack, S. (2010). General Deterrence Theory (364-365). In F. Cullen and P. Wilcox (Eds.), *Encyclopedia of Criminological Theory*. Los Angeles: Sage Publication.

Trugler, B. (2007). *Tax Compliance and Tax Morale: A Theoretical and Empirical Analysis*. Cheltenham: Edward Elgar Publishing Company.

Williams, C. C., & Schneider, F. (2016). *Measuring the Global Shadow Economy: The prevalence in Formal Work and Labor*. Cheltenham: Edward Elgar Publishing Company.