

The Effect of Legal System and Protection of Property Rights on the Size of the Tax Evasion: Panel Analysis

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This study seeks to find the impact of legal system and protection of property rights on the size of tax evasion. For this aim, MIMIC model estimates of size of tax evasion as percentage of GDP are utilized. Based on the Swamy's slope homogeneity test results, Group Mean Panel Dynamic OLS estimation is conducted. Long-run coefficients show that the relationship between tax evasion and impartial courts is negative in average. The relationship between tax evasion and protection of property rights is also negative in average. However, the signs of the relationship vary across economies within the sample.

Keywords: Tax Evasion, Impartial Courts, Legal System, Property Rights, Panel Dynamic OLS

Introduction

Every tax system is based on the expectation of a voluntary involvement of taxpayers to the system. They are expected to be conscious of their obligation to pay taxes. However, in most of the cases, consciousness of the taxpayers is created by the authorities. Public service advertisements serve as a good mechanism to engrave the virtue of paying taxes as a duty of citizenship to the minds. Governments may choose to give incentives by establishing campaigns of tax reduction for the ones who pay their taxes on time or in advance. Besides, frightening the taxpayers by speaking to them gently but carrying a big stick of penalty for the ones who do not pay taxes can be a method of the fiscal authority to raise the tax revenue more. Yet, the sanction for not paying taxes is controversial because it may not be possible to collect the fine from the ones who already chose to evade tax or not to pay tax. It is not highly likely to look for a payment from an evasive individual. Also, auditing the records of the all taxpayers is not physically and financially possible. Intensity of the punishment mechanism has to be deterrent without actually enforcing the punishment. Hence, the best way to increase tax revenues with a reduction in tax evasion is to increase tax morale so that taxpayers deliberately comply with the tax officers and fulfill their duty to pay taxes. But, after all, "cheating the government" is inevitable and will be perpetual (Cowell, 1990).

The line between illegal tax evasion and tax avoidance is not distinguishable clearly. While the tax evasion is illegal, the latter is not. Tax avoidance is inside the law, but certain types of avoidance may not be ethical as tax evasion as well (Cowell,1990). Legal gaps in the tax

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legislation are used by taxpayers so that they can shift category of their income (Sandmo, 2005). By so doing, they are able to lower their tax burden because some kind of income sources are subject to lower tax rates, such as the lower tax rate of capital income compared to labor income in many economies. Tax evasion, on the other hand, is seen as paying taxes by hiding endowment or by moving the activity to informal sector (Chong and Gradstein, 2007). For Pyle (1989), tax evasion includes illegal efforts to get around the rules for paying tax.

To make the analyses and reasoning concrete, tax evasion is taken as “willful tax noncompliance” as defined by Slemrod (2007), and it constitutes the subject of this research. So, for an action to be defined as tax evasion, there should be an illegal intention to decrease the legal tax liability (Alm and Martinez-Vazquez, 2003). There are many types of actions leading tax evasion. One is done by the firms or individuals who engage in illicit activities. Because the nature of the activity is not subject to record or audit by an authority, taxation of the economic activity is not possible. In general, tax for those illegal activities are collected by illegal authorities such as organized crime groups. However, according to Alexeev, M., Janeba, E., & Osborne, S. (2004), if the services provided by the mafia is important for the firms, in this case official tax rate is lowered. On the other hand, if the services provided by the mafia as an alternative of the government-provided public goods and services are not crucial for the firms, then operating in the shadow economy becomes costly for the firms. The contract between the firm and mafia becomes unilateral. While, firms pay taxes to those groups for a potential protection or contract enforcement, they take a service that is not valuable for them. So, there is a tendency to not engage in the shadow economy. Tax burden would be raised by the government.

Another type of action causing tax evasion can be described as the refusal of paying taxes and taking action for this goal although the economic activity is not illegal. Those kinds of activities are described as shadow economy or underground economy. Measuring the size of the shadow economy and defining the concept have attracted researchers because identifying the boundaries of the shadow economy is a hard job to accomplish.² Hence, there are studies delving into the relationship between the shadow economy and societal institutions. Social norms and institutional factors are taken into account to explain differences in the size of the shadow economies of different economies (Torgler and Schneider, 2007; Torgler and Schneider, 2009). For them, if the government looks out for taxpayers’ benefits and is committed to represent their preferences in administration, then the probability to stay in the official part of the economy will be high. So, it is highly likely to expect taxpayers to fulfill their fiscal obligations as well. That is, the higher the quality of the societal institutions, the lower the size of the shadow economy and tax evasion.

Institutional factors that affect the size of the shadow economy and tax evasion are not solely economic though. For instance, political corruption can be categorized as an administrative problem having side effects on the economy. Friedman, Johnson, Kaufmann, and Zoido-Lobaton (2000) search for the determinants of the unofficial activities. They state that corruption has a tight relationship with more unofficial activity in an economy. Corruption arouses interest in the literature as Dreher and Schneider (2010) claims that corruption and the shadow economy are substitutes in high-income countries whereas they complement each other in low income countries. Corruption and degenerated institutions feed tax evasion in two ways. First, if a taxpayer has opportunity to pay bribe to get rid of sanctions for tax evasion, then there will be a tendency to evade tax. Second, if a taxpayer is subject to extortion by an authority,

² For the difficulties and number of questionable methods to measure the size of the shadow economy and the tax evasion see Schneider and Enste (2000) and Tanzi (1980).

then the taxpayer is forced to evade taxes. Yet, Mookherjee (1998) reveals that corrupt tax authorities have an incentive to detect tax evasion more because of a potential bribe income. However, evasive taxpayers are discouraged from evading tax due to the high probability of being caught and obliged to pay bribe to corrupt officers.

Analyzing the effects of tax evasion is as important as examining the causal factors of tax evasion. The impact of the tax evasion activity can be regarded as positive if the researcher prefers to see only the encouraging power of tax evasion on the entrepreneurship. It is so attractive to invest more and more without paying tax for a producer. So, tax evasion gives incentives to the risk-lover entrepreneurs of the production sector to expand the investment decisions. On the other hand, downside of the picture shows that tax evasion lowers the collected tax revenues, which is the major source of a government. In conjunction with this, public services decrease in quality and quantity by the shrinkage in the government's budget. Decrease in the budget due to increasing tax evasion results in deduction in the financial sources that are put into service of societal or governmental institutions. That is, tax evasion will have a negative effect on the daily life of the general public in return. Hanousek and Palda (2004) states that taxpayers may not find the quality of the public services provided by the government adequate considering the amount of taxes they pay. So, they tend to evade tax based on the quality of the public services and the government's behavior towards taxpayers. Fairness in the taxation system can be regarded as an indicator of government's approach towards taxpayers. Tax system itself may push taxpayers to act on the illegal side. Sanyal et al. (2000) claims that the tax rates and the tax revenues are in a negative relationship if the tax administration suffers from corruption. Unfairness and corruption collectively result in a decrease in the tax revenues. For instance, if the tax administration follows a strict agenda on the tax audition procedure and increases the number of the audited tax returns, tax revenue of the corrupted tax authority declines. In addition, if this tax authority decides to raise the level specifically indirect taxes, then the demand for goods and services fall, which in return causes the collected tax revenues to decrease as well (Sanyal et al., 2000). Both the unfairness and the corruption destroy the institutional structure of the government. So they both encourage taxpayers to evade tax.

In addition to corruption, institutional structure of the government's approach towards taxpayers' interests have a significant effect on the size of the tax evasion. The relationship between the government and the taxpayer is a major determinant of the tax morale. For Torgler (2007), state intends to raise taxpayers' commitment to the tax system and guarantee the compliance of taxpayers by its positive approach to taxpayers. Moreover, the satisfaction with the government policies affects taxpayers' decision to evade tax. They continuously update decisions on the level of tax evasion according to effectiveness of the government's policies (Schnellenbach, 2002). Dell' Anno (2009) claims that tax compliance increases as taxpayers believe the government is fair and effective. If taxpayers' interests are represented by the government persistently, taxpayers are committed to pay taxes properly. Thießen (2010) notes that the causes of the shadow economy, which is a potential source of tax evasion are not merely related to taxation system, labor market structure or any market-oriented regulation. New theories including issues such as democracy, institutional factors affecting economic outlook have become much more influential on the formation of the shadow economy. Yet, government affects all these factors in one way or another because especially the institutional structure is mostly established by the government. Hence, by adjusting own behavior, governments have a chance to have an indirect impact on the size of the shadow economy. The most influential institutional characteristics and subjective factors are ranked as corruption, feelings and expectations, quality of justice system, and economic institutions respectively based on their quantitative importance on explaining the size of the shadow economy. First representative of

the subgroup of corruption indicator is the extent of political corruption. Feeling of happiness is the first representative of the feelings and expectations indicator subgroup. Judicial independence is the first representative of the quality of justice system. Protection of property rights is the first representative of the subgroup of economic institutions indicator (Thießen, 2010, p.491).

Corruption, as an institutional factor, affecting the size of the tax evasion has been studied widely in the literature. There is substantial literature on the relationship between happiness and the economic performance as well. But the effects of the governance indicators on tax evasion are comparatively untouched. For this reason, this study focuses on the tools that government can pursue the interests of the taxpayers such as the quality or the structure of the legal system and the protection of property rights. Both are indicators showing the effectiveness of the government policies and the reliability of the legal system. They show to what extent government cares for the benefits of the taxpayers.

Effectiveness of the impartial court system and how the property rights are secured by the law are the indications of how well the legal system functions. Legal system and the government's approach to the property right issues partially insures the economic freedom of the agents in the economy. An efficient legal system guarantees the existence of an efficiently operating market because the exchange which is the very simplest activity of an economic relationship is subject to enforcement of the commercial law by an authority. By building confidence in the administration and the legal system, government can discourage taxpayers from engaging in evasive activities. Therefore, we believe that there is a strong negative relationship between the tax evasion and an effective legal system in which property rights are decisively protected by the government. Hence, the focus of this paper is on how the legal system and protection of property rights affect the size of the tax evasion.

The remainder of the paper is as follows. Second part is about the features of the data utilized in the analyses and reveals the details of the methods used in the study. Empirical findings are elaborated in the third section and section four concludes the study.

Data and the Method

The data for tax evasion as percentage of the GDP are retrieved from Buehn and Schneider's (2016) study in which they generate a new series of tax evasion for a sample composed of mostly OECD economies. The data cover the years between 1999 and 2010. Their calculations are based on the MIMIC model estimations of the size of the shadow economies in those countries. During the measurement procedure, it is almost impossible to cover all the factors that cause tax evasion, but their method is valuable for being one of the first attempts to form a tax evasion data series. Although the data have deficiencies, it provides a rare and precious tool of comparison among economies that have similar features. Schneider and Buehn (2012) first specify the determinants of the shadow economies in the OECD countries. Although, these determinants are not equally effective on the size of the shadow economies over the OECD countries, the common identifiers of the shadow economy are personal income tax, indirect taxes, tax morale, unemployment, self-employment, GDP growth, and business freedom. For example, first four driving forces of the shadow economy are self-employment, indirect taxes, unemployment, and personal income tax in Turkey with shares of 41.4%, 31.4%, 16.4%, and 4.9% respectively. On the other hand, the main determinants of the U.S. shadow economy are personal income tax, unemployment, self-employment, and business freedom with shares of

27.5%, 22%, 16%, and 15.4%. So, while a taxpayer cares for the indirect taxes more in Turkey, s/he does not value the business freedom as much as a taxpayer value in the U.S.

In spite of the fact that the reasons of the tax evasion are different across economies and the relative impact of the driving forces vary between them, the result is tax evasion. Thus, while one cannot compare the reasons causing tax evasion across economies, size of the tax evasion is comparable. For Schneider and Buehn (2012), indirect tax burden and self-employment have the explaining power over the tax evasion related legal shadow economic activities. By putting the indirect taxation as the main driving force of the legal shadow economic activities that are related to tax evasion, they measure the size of the tax evasion for their sample. The average size of the tax evasion as percentage of GDP decreased from 2% to 1.5% for the OECD economies over the period 1999 to 2010. For the entire period the sample average is 1.8%.

Indicators for the legal system and the protection of property rights are retrieved from the Fraser Institute (2017). The institute generates indices for the degree of economic freedom. There are five major areas with 42 sub-components. And, impartial courts and protection of property rights are the two of the nine sub-components of the legal system and property rights area. Personal rights, protection of them and the properties are integral parts constituting economic freedom and civil society (Gwartney, 2018). Impartial courts guarantee the effective functioning of a legal system. Thus, impartial courts and the protection of property rights together show how the institutional structure of a protective government functions. By observing the efficiency and the functionality of the impartial courts, taxpayers are able to build trust to tax administration. The legislation on the protection of property rights can be written perfectly without leaving any gaps. However, quality of the impartial court system assures effective enforcement of the law on the protection of property rights. That is why these two variables are chosen as indicators of the legal system and protection of property rights. Indices are scaled from 0 to 10. To make the analysis more elaborate, log transformations are utilized for all the variables. So, all the coefficients indicate the effect of a percentage change in the relevant variable.

In this study, the main focus is to find the long-run coefficients of the two models in which dependent variable is log tax evasion. In the first model independent variable is log impartial courts. And, it is log protection of property rights in the second. For this aim, cross dependency tests are used for a potential cross-sectional dependency. In case of independence, first generation unit root tests could be used. Yet, in case of dependency between cross sections, second generation unit root tests have to be conducted. Depending on the integration order, Westerlund's cointegration tests are used. To figure out which method is proper to find the long-run coefficients, Swamy's test for the slope homogeneity is utilized. As a result, group mean panel dynamic OLS is determined as the suitable method to reveal the long-run coefficients. Finally, Dumitrescu and Hurlins's Granger causality tests are conducted to determine the direction of the causality.

Results and the Empirical Findings

In the first table, results for the cross-dependency check are documented. First, Pesaran's cross-sectional dependency test (Pesaran, 2004; Pesaran, 2015) is performed. It seeks if there exists a mean correlation between the panels. The null hypothesis is that there is cross-section independence within the variables over the panels. Tax evasion, impartial courts and protection of property rights are correlated across panels respectively. That is, the null hypothesis is rejected in all the conventional levels of significance.

Table 1
Cross-Dependency Test

Variable	CD- test	p-value	average joint
			T
log TAX	62.589	0.000	11
log IMPC	35.975	0.000	11
log PROP	40.792	0.000	11

In table 2, error test for cross-section independence in balanced panels are listed which are the Breusch and Pagan (1980) LM test (LM), the Pesaran, Ullah and Yamagata (2008) bias adjusted LM test (LM adj), and the Pesaran (2004) cross-dependence test (LM CD). The null hypothesis assumes that there is no correlation between the error terms among the panels. That is, $H_0: Cov(u_{it}, u_{jt}) = 0$ for all t and $i \neq j$. The null hypothesis of cross section independence is rejected even if the level of significance is %1.

Table 2
Bias-Adjusted LM Test of Error Cross-Section Independence

Log TAX and log IMPC		
Test	Statistic	p-value
LM	1943	0.0000
LM adj	91.52	0.0000
LM CD	42.46	0.0000
Log TAX and log PROP		
Test	Statistic	p-value
LM	2751	0.0000
LM adj	141.2	0.0000
LM CD	51.54	0.0000

Table 3A and 3B display Pesaran (2004) CD test results for residual cross-section dependence in panel time-series data. Under the null hypothesis, there is cross section independence across panel members. The null hypothesis is rejected at 1% significance level in the both tables. As a result, in three ways, the cross-section independency is rejected. Therefore, rather than first generation panel unit root tests, second generation panel unit root tests are utilized due to cross-section dependency.

Table 3A
Pesaran (2004) CD test for Residual Cross-Section Dependence

Variable	CD-test	p-value	corr.	abs(corr.)
Log TAX and log IMPC	11.13	0.0000	0.184	0.328

Table 3B
Pesaran (2004) CD test for Residual Cross-Section Dependence

Variable	CD-test	p-value	corr.	abs(corr.)
Log TAX and log PROP	19.41	0.0000	0.321	0.398

Table 4 reveals the results of the unit root tests based on Pesaran (2003) in case of cross-section dependency. The null hypothesis assumes that all the series are non-stationary. Lag is chosen as 1 and a time trend is included in the estimated equation. The null hypotheses are not rejected for three variables at 1% level of significance. The series are non-stationary. On the other hand, they all become stationary after the first difference of them considered. That is, log tax evasion, log impartial courts and log protection of property rights are integrated of order one: I(1).

Table 4
Second Generation Unit Root Tests

Variable	t-bar	critical value
log TAX	-2.76	-2.89
log IMPC	-2.693	-2.89
log PROP	-2.265	-2.89

Variable	t-bar	critical value
First Diff. log TAX	-10.555***	-3.30
First Diff. log IMPC	-8.135***	-3.30
First Diff. log PROP	-10.145***	-3.30

*** indicates significance at the 0.01 level

Because the series are all I(1), cointegration tests can be conducted. In table 5, Westerlund (2005) cointegration tests for some panels and all panels are documented. Both the impartial courts and protection of property rights are cointegrated with the tax evasion. First panel of table 5 shows that cointegration exists in some panels because the variance ratios are statistically significant at 1% significance level. Second panel of table 5 reveals the existence of cointegration in all panels at least at 5% level of significance.

Table 5
Westerlund Cointegration Tests

	statistics	p-value
Ho: No cointegration		
Ha: Some panels are cointegrated		
log TAX and log IMPC	3.5619	0.0002
log TAX and log PROP	6.2553	0.0000
Ho: No cointegration		
Ha: All panels are cointegrated		
log TAX and log IMPC	1.9052	0.0284
log TAX and log PROP	2.6711	0.0038

Table 6
Swamy Slope Homogeneity Test

	Swamy Test Statistics
log TAX and log IMPC	82871.10***
log TAX and log PROP	39482.30***
*** indicates significance at the 0.01 level	

Swamy's (1970) test of the slope homogeneity is utilized to choose between PDOLS estimation method and the Group Mean Panel Dynamic OLS estimation. Table 6 summarizes that the parameters are heterogeneous. The null hypothesis of the slope homogeneity is rejected. That is, there is country-specific heterogeneity and the relationship between tax evasion and the legal system and protection of property rights is heterogeneous among different economies. So, rather than PDOLS, which assumes homogenous parameters, Group Mean Panel Dynamic OLS is utilized. The latter has the heterogeneity assumption. Table 7 and 8 summarize the both average and individual dynamic OLS estimates for each economy in the sample by utilizing the Group Mean Panel Dynamic OLS estimation method. Although, the relationship between impartial courts and tax evasion does not follow a unique pattern for all the economies, the sample average is negative and statistically significant. The same explanation is valid for the relationship between tax evasion and protection of property rights as well.

Table 7
Log-run Coefficients (Group Mean Panel Dynamic OLS)

Dependent Variable: log TAX
Independent Variable: log IMPC

Country	Beta	t statistic	Country	Beta	t statistic
Australia	0.1767	0.1086	Ireland	0.2474	0.1343
Austria	-0.9953***	-3.219	Iceland	0.7592***	6.205
Belgium	0.01264	0.09162	Italy	-0.1098***	-2.638
Bulgaria	0.003478	0.07734	Korea, Rep.	0.2287**	2.084
Canada	0.3812*	1.934	Luxembourg	0.707***	7.116
Switzerland	-1.696**	-2.246	Mexico	0.08517	1.235
Chile	0.4918***	3.493	Netherlands	-2.421***	-4.321
Czech Republic	-1.441***	-3.767	Norway	0.2818**	2.508
Germany	0.4644	1.631	New Zealand	0.4514	1.257
Denmark	1.568***	3.706	Poland	-0.2268	-0.6661
Spain	0.529	0.5631	Portugal	0.145	1.213
Finland	-0.5427***	-3.882	Slovak Republic	0.2328***	5.069
France	0.3553***	7.129	Sweden	0.167**	2.256
Greece	-0.1286***	-3.693	Turkey	-0.1264***	-3.337
Hungary	0.04704***	14.08	Average	-0.01213***	6.337

***, **, * indicate significance at 0.01, 0.05, 0.10 levels respectively.

Table 8
Log-run Coefficients (Group Mean Panel Dynamic OLS)

Dependent Variable: log TAX
Independent Variable: log PROP

Country	Beta	t statistic	Country	Beta	t statistic
Australia	-0.2333**	-2.276	Ireland	1.556***	2.604
Austria	1.268**	2.082	Iceland	0.4716***	7.56
Belgium	-0.1526	-0.7666	Italy	-0.1173	-1.553
Bulgaria	-0.1595***	-5.198	Korea, Rep.	0.4942***	2.712
Canada	0.5695**	2.072	Luxembourg	0.4753***	2.604
Switzerland	0.02951	0.1488	Mexico	-0.07606	-0.4836
Chile	0.2526***	2.918	Netherlands	-0.1449*	-1.867
Czech Republic	-1.454***	-37.4	Norway	-0.1884	-0.7876
Germany	0.2474***	6.176	New Zealand	-1.113***	-14.17
Denmark	0.7127***	4.724	Poland	-0.1835***	-7.428
Spain	-3.706**	-2.104	Portugal	0.6976***	3.257
Finland	-0.02892	-0.4336	Slovak Republic	-0.4166***	-2.889
France	-0.06104***	-2.715	Sweden	0.1337	0.8136
Greece	0.04271	0.2866	Turkey	-0.1057***	-7.458
Hungary	0.3644***	9.769	Average	-0.02846***	-7.391

***, **, * indicate significance at 0.01, 0.05, 0.10 levels respectively.

Table 9 is constructed to show the direction of the causality between variables. While the impartial courts do not Granger cause tax evasion, tax evasion Granger causes impartial courts. In addition, protection of property rights Granger causes tax evasion, but tax evasion does not Granger cause the protection of property rights.

Table 9

Dumitrescu and Hurlin Granger Causality Tests

H0: log IMPC does not Granger-cause logTAX.

H1: log IMPC does Granger-cause log TAX for at least one panelvar (id).

z-bar tilde	p-value	Optimal number of lags (BIC)
0.7114	0.4768	1

H0: log TAX does not Granger-cause log IMPC.

H1: log TAX does Granger-cause log IMPC for at least one panelvar (id).

z-bar tilde	p-value	Optimal number of lags (BIC)
10.3949	0.0000	1

H0: log PROP does not Granger-cause logTAX.

H1: log PROP does Granger-cause log TAX for at least one panelvar (id).

z-bar tilde	p-value	Optimal number of lags (BIC)
8.1489	0.0000	1

H0: log TAX does not Granger-cause log PROP.

H1: log TAX does Granger-cause log PROP for at least one panelvar (id).

z-bar tilde	p-value	Optimal number of lags (BIC)
-0.1989	0.8424	1

Conclusion

Tax evasion and the impartial court system are negatively related as expected. The same finding holds for the relationship between tax evasion and protection of property rights. The sample utilized in this research is not homogeneous. Although the sample averages show the existence of negative relationships, the direction is not same in different economies within the sample. For instance, the long-run slope coefficient of impartial courts is 0.707 in Luxembourg, but it is -2.421 in Netherlands. That is, the effect of impartial courts on tax evasion is positive in Luxembourg, but it is negative in Netherlands. An unexpected result of the study is on the Granger causality. Impartial courts unexpectedly do not Granger cause tax evasion. However, this also may be related to the heterogeneity of the slope coefficients. If the number of observations were high enough to conduct Granger causality tests within panels, the direction of the causality would change. Indeed, the direction of the relationship between tax evasion and impartial courts becomes the main determinant of the causality relationship within panels. If the relationship is positive than tax evasion may cause impartial courts to be revised and developed. But it is not possible to conduct within panel Granger causality tests. This reveals a

major deficiency in the data. Although the number of observations in the sample is adequate, we do not have enough observations within the panels to do such an analysis.

On the other side, the negative sign of the relationship and the direction of the causality between tax evasion and protection of property rights are as expected. Protection of property rights Granger cause tax evasion. Yet, the long-run slope coefficients are not homogeneous as they were in the impartial court analyses. In Spain, for instance, the slope coefficient is -3.706, while it is 1.556 in Ireland. Although the findings appear to be conflicting, it is not surprising to reach different conclusions for different economies. That is so because the factors causing tax evasion are not equally effective across economies. Hence, it is inevitable to have different empirical findings on the direction of the relationship between tax evasion and the legal system and protection of property rights.

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