

THE EFFECTS OF TAX AMNESTIES ON TAX REVENUE AND SHADOW ECONOMY IN
TURKEY

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ABSTRACT

THE EFFECTS OF TAX AMNESTIES ON TAX REVENUES AND SHADOW ECONOMY IN TURKEY

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This thesis analyzes tax revenue and shadow economy implications of tax amnesties in Turkey after 1985. Cross-examination of amnesty effects was carried out through Ordinary Least Squares regression and Error Correction Model. In addition to amnesty years, pre and post effects of amnesties on revenue and shadow economy are analyzed. Results indicate that none of the amnesties necessarily display an escalating behavior for tax revenue except for 1988 amnesty. 1988 amnesty is found to increase tax revenue both in previous and actual years of the amnesty. Although results are in line with the previous literature on tax amnesties, amnesty implications are not very transparent since the frequency of amnesty practices is very high and they have mixed effects in Turkey. A similar conclusion is drawn for shadow economy as well. To begin with, shadow economy size is calculated through using '*Currency Demand Approach*'. In the next step, separate estimations are conducted with shadow economy calculations by *MIMIC* and *Currency Demand* approaches. Results are confirmative; it is estimated that 2002 amnesty alleviate the shadow economy size significantly, while its effects may also be influenced by 2001 amnesty. 2008 amnesty is appeared to increase the shadow economy size according to both estimations.

Keywords: Tax amnesty, Shadow Economy, Tax Revenue, Error Correction Model

ÖZ

TÜRKİYE'DE BAŞVURULAN VERGİ AFLARININ VERGİ GELİRLERİ VE KAYIT DIŐI EKONOMİ ÜZERİNE ETKİLERİ

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Bu tezde, 1985 sonrasında Türkiye'de gerçekleştirilen vergi aflarının kümülatif vergi gelirleri ve kayıtdıőı ekonomi üzerindeki etkileri incelenmiştir. En küçük kareler ve hata düzeltme modelleri kullanılarak, elde edilen veriler karşılaştırılmıştır. Af yıllarına ilave olarak, afların af öncesi ve sonrası etkileri de analiz edilmiştir. Sonuçlar, vergi aflarının vergi gelirleri üzerine önemli bir etkisinin olmadığı yönünde olup, sadece 1989 yılına ait vergi kanununun, önceki bir yıl ve af yılı içinde vergi gelirlerinde artışa sebep olduğu bulunmuştur; vergi aflarıyla ilgili literatürle aynı doğrultuda olsa dahi, bu etkiler çok net olmaktan uzaktır çünkü af uygulamalarının sıklığı, aflardan kaynaklı etkilerin içiçe geçmesine ve birbirini etkilemesine neden olmuştur. Kayıtdıőı ekonomi için de benzer sonuçlar geçerlidir. Kayıtdıőı ekonomi modellemesinden önce, ilk olarak '*Para Talebi*' yöntemi ile saklı ekonomi büyüklüğü hesaplanmış ve MIMIC yaklaşım da kullanılarak iki ayrı analiz yürütülmüştür. Sonuçlar birbirini destekler niteliktedir. 2002 yılı affı kayıtdıőı ekonomiyi ciddi şekilde düşürmüştür. 2008 yılı affının ise kayıt dıőı ekonomiyi artırdığı sonucuna ulaşılmıştır.

Anahtar Kelimeler: Vergi Affı, Kayıtdıőı Ekonomi, Vergi Geliri, Hata Düzeltme Modeli

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey Fuller
BG	Breusch Godfrey
BGP	Breusch Godfrey Pagan
KPSS	Kwiatkowski–Phillips–Schmidt–Shin
ECM	Error Correction Model
DW	Durbin Watson
OECD	Organisation for Economic Co-operation and Development
HP Filter	Hodrick-Prescott Filter

CHAPTER 1

INTRODUCTION

Revenues obtained from tax collection are the most significant financial source for countries. Importance of tax revenue escalates as to situations of countries; that is, whether they are developing countries or not. For developing countries, tax collections are more essential since they are in process of improving their welfare and necessity for investments gives rise to obligation of spending much more money as well. For instance, tax revenues in USA was % 10.1 of US Government's GDP, while that of Turkey's is % 20.1 in the fiscal year of 2011 (World Bank, 2013) ; revealing that Turkey, as a developing country, relying more on tax revenues than developed countries. However, tax collection remains to be a common problem regardless of whether countries are developing or developed.

Another problem that governments seek for remedy is the size of shadow economy. Shadow economy growth is a worldwide issue governments need to consider since it affects the welfare state of countries, through diminishing the potential taxes to be collected otherwise. Shadow economy rates as percent of GDP is higher in developing countries than developed ones. Schneider (2013) recently demonstrates that average shadow economy size in European countries is 18.4 % of GDP in 2013. As a developing country, however, Turkey yields the size of 26.5 % which is very much above the average.

Governments sometimes regard tax amnesties as a common cure to these two essential problems. Tax amnesties might be thought as a way to decrease the size of the shadow economy and to increase the tax revenues. Tax amnesties have been applied frequently by developed countries such as Belgium, Australia, Finland, France, Italy , Switzerland and approximately 40 states of US (since 1980) while the frequency is so

much higher in developing countries that it has been becoming a routine. Turkey, as one of these developing countries, applied amnesties for several reasons, whilst the most pronounced one is to gain short run revenue.

The main purpose of this thesis is to investigate the effect of tax amnesties in Turkey on tax revenues and the shadow economy. Although the policy makers in Turkey argue that the tax amnesties increase the tax revenues and decrease the size of the shadow economy, the economic literature suggest that tax amnesties increase the tax revenues only for a short period of time and decrease it in the future and the tax compliance fall after the tax amnesties. (Dasgupta and Mookherjee (1995)) Tax amnesties in Turkey nearly became a tradition in the last decade. Between 1968 and 2000 there has been either a tax or social security payment amnesty nearly every year. Since 1960 there have been more than 35 amnesties in Turkey but the effect of these amnesties on tax revenues and shadow economy had not been studied empirically before.

There are a handful of papers on tax amnesties in Turkey. Savaşan (2006) argue about the effectiveness of Turkish Amnesties focusing on the last tax amnesty over that time so called the 'Tax Peace' in 2003. The author qualitatively argue about the benefits and costs of the tax amnesties, give a historical information about the tax amnesties in Turkey and try to investigate the effect of 2003 amnesty on tax revenues. No empirical methods have been employed in this study. The author argue that the tax revenues numerically increase after the tax amnesty in 2003 but the negative impact of tax amnesties on compliance in the long run might be an important issue. Saraçoğlu and Çaşkurlu (2011) investigate the effect of tax amnesties in Turkey using a survey. Authors ask whether amnesties distort the tax compliance in the future. Authors argue that honest tax payers that did not benefited from tax amnesties think that tax amnesties help tax dodgers and decrease the tax compliance. İpek, Öksüz and Özkaya (2012) investigate the effect of tax amnesties on tax compliance. Again by using a survey data on taxpayers in Çanakkale, Edirne, Kırklareli and Tekirdağ provinces in Turkey authors show different perceptions of taxpayers on tax amnesties. Tax payers that did not benefit from the amnesty suggest that tax amnesties harm tax compliance and should

never be applied. Tax payers who benefited from the amnesty no surprisingly have the opposite opinion.

In contribution of this thesis is that we ask whether Turkey succeeded in increasing tax revenue and decreasing the underground economy size, using Ordinary Least Squares (OLS) and Error Correction Model (ECM), using time series data for the first time. A deep analysis of tax amnesty practices in Turkey after 1985 was carried out and revenue and shadow economy impacts of amnesties are interpreted. Following the economic literature our results suggest that the positive influence of amnesties in Turkey on tax revenue and shadow economy is limited. We find a positive impact of 1988 amnesty on tax revenues for both in the long run and short run. Other amnesties do not seem to increase the revenue collection of the government significantly. We do not find any effect of tax amnesties in Turkey on the shadow economy except 2002 amnesty. We find that 2002 amnesty decrease the size of the shadow economy significantly in Turkey while its effect is not very transparent due to mixed effects of subsequent or previous amnesties. In general, we find that the amnesties were not as useful as thought by the policy makers. Alternative disciplines to tax collections and shadow economy reduction such as increasing institutional quality, diminishing tax burden and increasing tax awareness may be constituted instead of tax amnesties.

Although short run gain may be the main purpose, an intention of decreasing size of underground economy is also adopted by the government in particular amnesties. Schneider and Savaşan (2007) advocate that tax and social security contribution burdens are one of the main reasons of shadow economy. It is expected, therefore, a reduction in shadow economy along with a reasonable and effective tax amnesty offering that could at least succeed in stabilizing tax burden aftermath. Amnesty contents are tabulated in table 1; showing that 1983, 2003 and 2008 amnesties comprise black asset declaration, proving that underground economy is also intended to be reduced by the Turkish government.

Chapter 2 includes the literature review. Data used in empirical analysis is explained in chapter 3. Descriptions of variables and their data sources are tabulated. Empirical results are provided in Chapter 4, together with detailed illustrations for more clarification. Findings show that amnesties do not seem to be significantly influential on neither short term nor long-term gains in tax revenue and reduction in shadow economy in Turkey. Results are in line with expectations when regulations and behaviors of taxpayers are taken into consideration. There are several reasons underlying the failure such as deavoidance of effective enforcements after amnesty implementations, high frequency of implementation and reduction in tax morale. A detailed interpretation of the results is provided in further evaluation part. Conclusion is provided in chapter 5, which comprehends the key points, results and concluding remarks.

CHAPTER 2

LITERATURE REVIEW

2.1 Tax Amnesty

Tax evasion is an ongoing problem of governments, which embraces various determinants. For healthier collection of taxes, governments seek for old fashioned methods without understanding these determinants. Tendency to evade taxes may overwhelm tendency for regular payments for some citizens and corporations. The extent of this tendency for evasion depends on several aspects including enforcements, inspections, awareness, morale and penalties that the country will implement. Unfortunately, it may be insufficient to hinder the evasion even if the combinations of these aspects are on their most efficient conditions. Hence, governments may apply a widespread practice so as to prevent the magnitude of evasion, to save uncollected past payments and to decrease the size of hidden economy as much as possible. This common practice is called as *tax amnesty*. Tax amnesties are government programs to allow citizens voluntarily to pay for their previously evaded taxes in a time horizon without being exposed to punishment. Amnesties may be permanent or temporary, most generally temporary, and voluntary participation is inherent to them in which unparticipated evaders are exposed to more intense penalties in case they are caught. Another important feature of amnesties is that they may be applied for the principal payments or for penalties and interests or for both of them.

At a glance of fiscal histories of governments around the world, we see that most of the governments applied amnesty programs to increase revenues. Although amnesties are not the only way to gain revenue, amnesties are acted due to political reasons since the other revenue raising alternatives such as increasing tax rates may result in reduced chance of re-election (Luitel and Sobel, 2005). Therefore, amnesties seem more attractive than alternative policies for politicians.

Although the main reason for tax amnesty is increasing tax revenue, an amnesty program may have other benefits. Firstly, program may help collecting money from underground economy and capital held abroad. In this way, governments raise short-term revenue and at the same time, tax base gets bigger and future tax collections have the chance to increase (Uchitelle, 1989). Secondly, accumulated paper work and administration costs stemming from evaders may be reduced (Alm, McKee and Beck, 1990). In a complex and ineffective tax system, huge numbers of tax cases are occupying courts and are slowing the justice and bureaucracy mechanism. By an amnesty program, courts get rid of a serious workload. Another one is that it might get some evaders to path of honesty. This is especially important where true income disclosure is difficult and tax code is complex because some honest taxpayers may evade taxes unconsciously due to complex system (Leonard and Zechhauser, 1986). Such individuals actually want to correct their past actions but are afraid of penalties and prosecutions. When they are aware of amnesty, they take the chance and become honest citizens. By this way, future tax compliance meaning the degree of obeying tax code in declarations increases (Torgler and Schaltegger, 2005). Finally, an amnesty may help in transition to a new tax regime and signalizes that tax evasion is under consideration by government and this problem will be taken care following the program. This aspect may be helpful for future compliance.

Despite potential benefits, tax amnesties have disadvantages and serious drawbacks too. Firstly, introduction of an amnesty program informs public about existence of tax evasion (Alm and Beck, 1993) and compliant tax payers may perceive amnesties as a rewarding mechanism towards tax evaders while as a punishment mechanism towards themselves because return of assets which undisclosed and evaded is higher than disclosed ones. Furthermore, if amnesties are considered as a forgiving tool for tax evaders and that tax evasion is forgivable, then honest taxpayers may reduce their compliance in the long run and this attitude results in problematic financial consequences. Feld and Frey (2002) argue in their study that governments should prevent honest taxpayers from being exploited in the process. Alm, McKee and Beck (1990) had an experimental study and found out tax amnesty decreases tax compliance

significantly. In the same study, they classified taxpayers into three classes as high compliant, moderate compliant and low compliant according to their compliance rate and they saw that an amnesty did not affect compliance rate of high and low compliant ones but compliance of moderates fall significantly. Also if taxpayers think amnesty will be repeated in the future, tax compliance falls further. Thus, when introducing an amnesty program, the governments should keep their conclusiveness and make public believe it is one time chance, otherwise public will expect future amnesties causing decrease in tax compliance. Secondly, tax amnesties produce very small revenues. Thinking amnesty examples around the world, very few amnesties are successful in generating revenue. Labordo and Rodrigo (2003), Alm and Beck (1993), Alm, Vazquez and Wallace (2009) and Luitel and Mahar (2013) found out using time series analysis that governments did not raise significant revenue by their amnesty programs. Das-Gupta and Mookherje (1995) indicate just one amnesty program out of twelve results in significant increase in tax revenues in India. Franzoi's (1998) study indicates that gaining additional net revenue from tax amnesty is impossible. This is evidenced by İpek, Öksüz and Özkaya (2012), stating that revenues not only remained unimproved, but also display diminishing behavior in long term for certain cities in Turkey. Also Fisher, Godderies and Young (1989) state in their empirical investigation of Michigan amnesty program that amnesties are not effective solutions to bring back nonfilers into the system. They conclude additional long-term revenue coming from new payers is very small and can be easily offset by compliance reducing effects. Likewise, Luitel and Sobel (2005) conducted a study, covering 76 amnesties within 23 years in US states and concluded that short run revenue is accrued as a result of a state's first amnesty, which is accompanied by a long run revenue loss. It is seen that amnesty may increase revenue a little but may decrease tax compliance, tax morale significantly and cause long-term financial problems, which are hard to fix.

Although amnesty policy has advantages and disadvantages, it has been used before and it will probably be used in the future. Therefore tax authorities look for ways to make tax amnesties efficient. According to the theory, amnesty itself lacks properties in fulfillment of its purposes. Achievement of these purposes not only depends on

amnesty content, but also cautions of the government that are taken after amnesty period which are; effective inspections, increased penalties, true enforcements, extent of the amnesty, increase in tax awareness and tax morale and nonrecurrence of amnesties.

Amnesties, in general, are temporary and voluntary and amnesty content should include appealing terms for taxpayers to disclose their debts voluntarily or declaration of a strict and intense regulation is necessary after amnesty to compel them to be voluntary in the process. One of the ways to do so is increasing the probability of detection through stiffer audit mechanisms. However, this may not be sufficient if the marginal benefit of the evader still overweighs the costs of being caught. Thus, penalties should also be leveled up that is enough to create the fear of losing more than they gain. For declaration of black assets, for example, rate of return alleviates with more asset declaration and substantial gain decreases. Hence, if rate of return on black incomes and black assets is so high that can overwhelm the penalty of detection in long run; they can take a risk of being caught if they are able to afford the penalty in short run. Penalties are also inconclusive without effective auditing since increased penalty do not mean anything if evaders think they will not get caught. Hence, there is reciprocal relationship between audit mechanisms and penalty increases and one does not mean much without another. Das-Gupta and Mookherjee (1995) represent supportive arguments, saying that incentives for participation depend on the probability of being caught as well as level of penalties and many citizens do not take place in programs due to lack of control mechanisms and harsh penalties. Savaşan (2006) claims that effective audit mechanisms and penalty increases together with intensified enforcements increase tax compliance, which is an indicator of a successful amnesty, and ultimately captures the non-filers as well as retaining filers. Alm and Beck (1991) also claims that stiffer penalties and audits contribute to enhancing compliance. Franzoi (1998) favors the idea that collections may increase through effective auditing. Thereby, control mechanisms for evaders need to be intensified such that tax audits are more efficient and comprehensive; and penalties need to be increased to a point that

no evaders can venture the risk of being caught. If these measurements are taken before amnesty, declaration of these enforcements should be carried on meticulously.

Enforcements may be in a different form from increased penalties or auditing. Recovering fines, decreasing tax burdens or relieving tax obligation of some taxes are some examples of enforcements that may be really effective in amnesty and post amnesty behaviors of taxpayers. Not only amnesty may require these sorts of enforcements, but also enforcements may necessitate tax amnesties to be efficient. For example, Stella (1990) argues that an amnesty may be a necessary precondition of an enforcement program, which aims especially at discovery of undisclosed white incomes. Therefore, improvements in tax system and as well as shadow economy may be pursued by an amnesty and it can be concluded that there is reciprocal relationship between enforcements and amnesties and both might necessitate one another for eventual success. Alm, McKee and Beck (1990) reinforce the argument that intensified enforcements increase compliance after amnesty implementation. Alm (1998) advocates that people are more likely to participate if amnesties are accompanied by a remarkable change in tax policy; even he thinks the failure of 1987 amnesty in Argentina is owing to inexistence of new enforcements in the tax system. In a similar study of Leonard and Zeckhauser (1986), amnesty program in Massachusetts was very successful in revenue and compliance increase thanks to heightened enforcements such as publicizing seizures, revoking the licenses and canceling contracts with delinquents in addition to heightened penalties. The authors suggest that effective amnesty raise significant revenue if it is combined with previously advertised increase in enforcements. Thereby, mutual relationship between amnesty and enforcements allow reconfiguration of amnesties while the chance of success increases with regard to amnesty implications.

In an experimental study, Torgler and Schalltegger (2005) found that tax amnesties may increase tax compliance if tax payers are given the opportunity to vote for tax amnesty. The authors also evidenced that permitting discussion among taxpayers increases tax compliance further because discussion makes moral costs of nonparticipation and free riding higher.

Although the literature is very limited, it may be reasonable to propose that revenue increases is more probable if the scope of the amnesty is greater. That is, if particular aim in amnesty program is to gain short run revenue, it is better to increase the comprehension as much as possible in order to capture more evaders. Yumuşak (1997) proposes that as the number of obligator increases, gains in revenue also increase.

Tax awareness is another issue, which may alter the behaviors of decision makers. Tax awareness can simply be defined as awareness of citizens about their tax obligations and comprehension of why they need to fulfill these obligations. Efforts to pay taxes increase as awareness increases (Kumluca, 2003). It is reasonable, therefore, to argue that there is positive relationship between tax awareness and tax compliance since people tend to resist more to something they do not know about. Tax compliance is filing of assets and incomes in a timely manner, in accordance with tax laws. Noncompliance, whereas, consists of both underreporting and over reporting (Roth, Scholz and Witte, 1989). Although there is little about tax awareness in the literature, some studies reveal its importance on tax system. For instance, Acar and Merter (2008) include low tax awareness as being one of the main factors of ineffectiveness in tax system. Similar opinion is also expressed by İpek, Öksüz and Özkaya (2012), demonstrating that studies for creation of tax awareness is so crucial that can increase compliance significantly. Alstadseter and Jacob (2013) also suggest from their empirical findings that any decline in tax awareness increase the likelihood of misreporting.

Tax awareness is relevant to the issue of tax morale as well. Tax morale is an attitude, rather than a behavior that stems from tax awareness (Oral and Sayın, 2009; Torgler and Schneider, 2007). Hence, it can be regarded as moral obligation to pay taxes and contribute to the society. If awareness increases, the opportunity to feel guilt and regret in case of evasion also advances and any action to increase the idea that noncompliance is immoral also escalate the awareness of necessity to pay taxes as a citizen, as basic obligation for well being of others as well. People may be tax aware but choose not to pay due to low morale. Hence, it can be easily concluded that any increase in tax morale may increase the tax collections and alleviate the shadow economy size because increase in tax morale ends up with higher degree of tax

compliance. What is essential here is whether the amnesty contributes to awareness and then fulfills the enhancement in tax morale.

Tax morale and therefore tax compliance may be enhanced through improving the notion of justice. Kargı and Yüksel (2010) advocate that justice is the key factor, which determines the behaviors of taxpayers. Feeling of inequality is a driver of injustice perception. Feld and Frey (2002) refer to the significance of justice, suggesting that authorities should treat taxpayers in a respectful manner but avoid exploiting honest taxpayers at the same time. So, honest taxpayers may perceive amnesties as a rewarding mechanism towards tax evaders while as a punishment mechanism towards themselves and this inequality may result in decrease in compliance (Savaşan, 2006). Another inequality feeling stems from the opinion of paying more than they could afford or more than necessary (Oral and Sayın, 2009). According to Oral and Sayın, belief that tax burden is unjust results in evasion and long run resistance to pay taxes. They reinforce this statement through referring a study conducted in Manisa, displaying the first line of complaints about unjust tax legislations. Another driver of injustice perception is low institutional quality. Demir, Macintyre, Schaffner and Torgler (2008) argue that institutional quality is one of tax morale determinants. In countries that are highly corrupted, citizens are reluctant to pay their tax obligations since they do not see taxes as a social obligation to contribute to the society but as mandatory to increase the wealth of officials only. Thus, trust between taxpayers and government may determine the fate of tax collections. Adam Smith (1776) supports the idea in his book 'Wealth of Nations': "In those corrupted governments where there is at least a suspicion on unnecessary expenditure or misuse of public revenue, the laws are not fully respected". Overall, these three sources of injustice in the laws may significantly alleviate tax morale and the compliance. Hence, an amnesty must be accompanied by strict enforcements that lead to increase in institutional quality. Although there is not guarantee for success, negative effect on compliance may be reduced with these measures. Alm and Beck (1993) points this situation in their study of Colorado amnesty program, by stating the possibility that compliance reducing effects may be offset by compliance enhancing effects of the greater enforcement efforts.

As a result, with or without tax amnesty, awareness has always been an issue that must be taken into account for long term economic concerns since it may prevent governments to apply amnesties all by itself if it is managed properly. Firstly, tax awareness should be increased by promotions and enforcements of the government. Secondly, tax morale implications need to be taken into consideration when an amnesty is applied. Amnesty should be in a form that cannot offend honest taxpayers and increase the institutional quality. If compliance-enhancing impacts cannot master the compliance reducing effects, it may be foreseen that the amnesty is destined to fail.

Last but not the least, role of recurrence on amnesty success should not be underestimated. It is known an amnesty is generally the most effective in its first release and the extent of affectivity falls as the number of repetition scales up. As an illustration, Luitel and Sobel (2005) substantially conclude that revenue effect of a state's amnesty is totally depends on whether the state has previously offered an amnesty. Acar and Merter (2008) also reinforce this conclusion by explaining negative impact of frequent changes in tax laws and large number of tax laws on overall tax system inefficiency. In addition, failure of accruing tax penalties and repeating amnesties over a short period of time underlies the reasons why tax system is not productive. Ipek, Öksüz and Özkaya (2012) also stresses that tax amnesty should be a onetime application while Alm (1998) agrees with the opinion that citizens' belief should be in a direction of one time opportunity. The rationale beyond these claims is based on psychological considerations that if evaders are not convinced that amnesty was for only once, their expectations incline them towards evasion, which may be even more than before. Sayar (1987) sponsors this situation, proposing that citizens who are inclined to evade and think they can get free of charge either partially or completely in near future will definitely commit evasion. Likewise, Melik and Schwab (1991) display in their study that high the probability of repetition lowers the declaration of income.

Hence, repeating amnesty frequently is not a good practice since it becomes to be anticipated easily. Anticipation is also discussed in detail in India case, since India government also adopted amnesties repeatedly in short time horizons. Das-Gupta and Mookherjee (1995) advocate that, if taxpayers anticipate amnesty, adverse impacts on

tax compliance occur. It is also indicated that citizens with black incomes and black assets want to disclose less in pre amnesty years and accumulate more and more for disclosure in the amnesty year; which, in turn, results in illusory revenue gains accompanied by revenue losses in pre amnesty years. In addition, anticipation decreases tax compliance and, naturally, tax revenue in the long term. Stella (1990) evidences that amnesties should be used on a once and for all basis since credibility of implementation is not fulfilled otherwise. Alm (1998) emphasizes the importance of government credibility as well, indicating the necessity of making people believe one time application of amnesties are followed by improved enforcements rather than to be used as emergency buttons for revenue. Otherwise, it would only cause enhanced non-compliance in anticipation of next emergency case. It can be deducted from these arguments that recurrence also causes decaying tax morale. As discussed in chapter 2.3, Luitel and Sobel (2005) find that firstly offered amnesties produce % 4-5 increase in short run revenue on average whereas their noncompliance effect reaches up to %3 per period. Moreover, increasing number of the repetition implies smaller revenue gains in the short run while larger revenue losses in the long run. As a result, recurrence of amnesties is unreasonable due to their anticipation and tax morale effects and negative long-term influences.

2.1.1 Tax Amnesties in Turkey

In Turkey, amnesties are declared with a variety of tax laws and it is known that amnesties have become a routine, which began in 1930s but are used very often since 1960s. The Turkish government applied tax amnesties for 14 times as of 1980. Some amnesties had common forms like only cancellation of penalties while some others were general amnesties or included only specific taxes' penalties and some others also included even tax principals. It is seen that almost every form of amnesty is practiced in Turkey. Table 1 provides general information of amnesties in Turkey since 1960 but also detailed explanations about amnesties after 1980 are given following table 1.

Amnesty in 1981: It was acted by law number 2431 and taxes, charges and duties included in tax code were incorporated by this legislation. 90% of accrued penalties related to taxes, charges and duties were cancelled. In case of unaccrued penalties, entire penalties were cancelled with condition that tax principal would be paid on time.

Amnesty in 1983: It was acted by law number 2801 and the aim of the program was to build a healthier tax authority structure and to decrease too much workload of newly founded tax courts. Since amnesty in 1981 did not meet expectations, just after two years later, this legislation was introduced. This regulation included taxes, charges and duties incorporated in tax code and penalties related to these. According to the legislation, whole tax penalties were cancelled and 50% of late fees were cancelled if evader had paid their tax principals until then end of 1984.

Table 1 Tax Amnesties in Turkey after 1960

Year	Law number	Content	Payment Schedule
1961	281	Penalties, late fees and overdue interests are cancelled	Until the end of 1961
1963	218	All tax penalties of tax payers	N. A
1963	252	All tax principals and penalties of Sports Clubs	-
1963	325	All taxes accrued of government business enterprises after 1960	-
1965	691	All tax principals and related penalties, late fees of municipals and enterprises owned by municipals	-
1966	780	Tax penalties and late fees	
1974	1803	Tax penalties and late fees accumulated until 1974, charges and duties, cadastre charges	In 8 months
1981	2431	Penalties related to taxes, charges and duties, black asset declaration	Until 31.08.1981
1983	2801	Penalties related to taxes, charges and duties and update of wealth declarations	Until the end of 1984
1985	3239	Tax penalties and late fees	Until the end of 1985
1988	3505	Tax penalties, late fees and overdue interests	Until the end of 1988
1988*	3512	Tax penalties, late fees and overdue interests of municipals	Until 30.06.1989
1989	3571	Tax penalties, late fees of associations and foundation and enterprises owned by them	24 installments in 24 months
1990	3689	Tax penalties, late fees and overdue interests	2 installments until 31.01.1991
1992	3787	Penalties and late fees related to taxes, charges and duties	Until October of 1992
1997	400	Restructuring or delay of penalties	N.A
1998	4369**	-	-

Table 1 (cont'd)

2001	414	Restructuring or delay of all payable tax principals or penalties and late fees	-
2002	4751	Tax principals and penalties of real estate taxes	Until May of 2002
2003	4811	Taxes, charges, duties and related penalties, late fees and overdue interests, update of declarations	Until October of 2004
2008	5811	Black asset declaration, cancellation of tax principals before 2008 for unregistered assets	In a month after declaration
2011	6111	Restructuring tax principals, penalties, late fees and overdue interests	18 equal installments in 36 months

*Acted at 28.12.1988 so accepted as amnesty in 1989 for analytical purposes

** The law was postponed till 2003 after a short time since its introduction

Amnesty in 1985: It was acted by law number 3239 and the content of tax liability was enlarged and tax penalties were increased with this legislation. Also some procedures of tax collection process were changed to make tax system more efficient. This law cancelled all penalties and late fees of all taxpayers who paid all tax principal and 25 % excess of it until the end of 1985.

Amnesty in 1988: It was acted by the law number 3505 at 28.12.1988 and the purpose of the law is to collect taxes unpaid at their maturities and to make tax administration and tax courts more effective by decreasing their workload through the amnesty. According to legislation, all tax penalties and late fees of all taxpayers who paid tax principals and 30% excess of it were cancelled. Besides, 70% of penalties and late fees of all taxpayers who paid tax principals were cancelled.

Amnesty in 1989: There were two regulations implying amnesties, which were by the law number 3512 and 3571. The aim of the law no: 3512 was to collect unpaid taxes from municipals and firms owned by municipals and all penalties, overdue interests and late fees were cancelled if tax principals were paid fully until 30.06.1989. The aim of law

no: 3571 was to collect unpaid taxes by businesses owned by associations and foundations that are exempt from taxes. All penalties, late fees and overdue interests of tax payers who paid full of tax principal and 10 % excess of it in two years with equal payments were cancelled.

Amnesty in 1990: It is acted by the law number 3689 and the regulation brought partial cancellation in tax penalties, late fees and overdue interests. Taxpayers who paid their tax principals and 30 % of their penalties and late fees were exempt from the rest of the penalties. One point was that amnesty was limited with just ten days and due to problems in operations and short time period, it was thought that many taxpayers could not benefit from the amnesty.

Amnesty in 1992: It was acted by the law number 3787 and this regulation was one of the most comprehensive tax amnesty laws. The law includes smuggler, repentant tax evaders, and other taxpayers who disclosed their income less than real in the past. The legislation cancelled 70% of penalties with regular payment of tax principals and 30% of penalties.

Amnesty in 1997: It was acted by the communique number 400 and the reason of the amnesty was to raise tax revenues from tax payers who could not pay their taxes due to recent economic and financial problems in the country. With this regulation, tax authority gave taxpayers the opportunity to pay their taxes as installments or to delay their payments in return 6% interest rate.

Amnesty in 1998: It was acted by law number 4369 and this regulation made very important changes in tax laws and tax authority tried to start a new stage in tax system. In this respect, this law was seen as financial milestone. Especially very significant amendments were made income tax law. After the regulation, every tax payer was expected to declare his assets to tax administration but economics crisis began in Thailand affected Turkish economy as well and this law was postponed until 2003 and cancelled with introduction of law number 4369 in 2003.

Amnesty in 2001: It is acted by the communique number 414. With this regulation, tax authority gave taxpayers the opportunity to pay their taxes and penalties as installments or to delay their payments in return 3% interest rate.

Amnesty in 2002: It is acted by the law number 4751 and real estate taxes before 1998 were cancelled if tax payers who did not register their property to the tax authority paid their accrued taxes between 1998 and 2001 and 50% excess of it. Also for accrued taxes for 1998-2001, no penalty or late fee would have been paid. In this respect, this amnesty act was seen as unfair.

Amnesty in 2003: It is acted by the law number 4811. The aim of the amnesty was to collect accumulated unpaid taxes due to economic crisis in 2000 and 2001. The program was also called 'Tax Peace'. The law includes taxes, penalties, late fees and overdue interests but the main property of the program was that it gave the chance of increasing tax base. The regulation gave the opportunity of paying taxes and penalties by 9 installments and calculation of penalties, late fees and overdue interests with lower interest rates to tax payers who did not pay accrued taxes.

Amnesty in 2008: It was acted by law number 5811 and also called 'Asset Peace'. The purpose of the law was to bring the unregistered assets into legal economic system and to help private sector strengthen its capital structure in stressful economic conjuncture. Accrued taxes in 2008 and related stamp taxes are exempt from the program but all kinds of taxes related to newly registered assets were cancelled. According to the law, every taxpayer had to declare and register his assets to tax administration until February 2009 and 2% tax from assets coming from abroad and 5% tax from domestic assets were collected. Accrued taxes including motor vehicles tax were also restructured and planned to be paid in 9 installments in 18 months.

Amnesty in 2011: It was acted by the law 6111. The law includes taxes, social contribution premiums and unpaid utility invoices. According to the law, tax principals would be kept but all penalties, late fees and overdue interests would be cancelled. Tax

principal was restructured by applying inflation rate for every year having no payment and was supposed to be paid in 18 equal installments in 36 months. All kinds of taxes and premiums until 2010 were included in the amnesty program.

It is easy to notice that amnesties in Turkey are at a high frequency and this contradicts the suggestions in the literature. Time horizons for these amnesties range between 1 to 5 years. 5 years itself, is considered so short that can decrease effectiveness dramatically; whereas, there are even amnesties which are applied each year. Hence, amnesties in Turkey can be regarded as anticipated, as it has been a continual application. Savaşan (2006) supports anticipation of amnesties in Turkey by stating that citizens are in expectations of amnesties. Taşkın (2006) claims that people are aware that each time is not the last implementation, even if the government tries to generate totally opposite perception. In addition, tax laws are becoming far away from being regulatory but closer to being incentive to evasion (Oral and Sayın, 2009). Turkish Tax Laws avoid using the word of '*amnesty*' in order to eliminate negative perceptions of amnesty; rather, alternative words are preferred. This is not a sufficient exercise, however, to prevent anticipation and noncompliance. So, it may be clearly deduced that, citizens easily anticipate amnesties in Turkey and it is difficult to fulfill their aims unless they are accompanied by strict enforcements and other success parameters are met.

When other success parameters are investigated, it becomes more evident why amnesties in Turkey were no help at fulfillment of their purposes. As Aktürk (2005) indicates, tax audit system is not enough quantitatively therefore it does not frighten taxpayers. This statement is supported by the statistics, given by Aktürk (2005), testifying that only %3-4 of taxpayers are being audited while these audits are ineffective additionally. Acar and Merter (2008) approaches from a different perspective; arguing that tax audits in Turkey are only conducted after occurrence of some mistakes and incorrect results of internalized tax system. It is seen that tax rates are reduced after 1985, 1997 and 1998 amnesties, whereas, reduction of tax rate remains distant from being an effective enforcement since tax burden did not decline in

neither of those amnesties afterwards, where tax burden is measured by total tax revenue as a percentage of GDP.

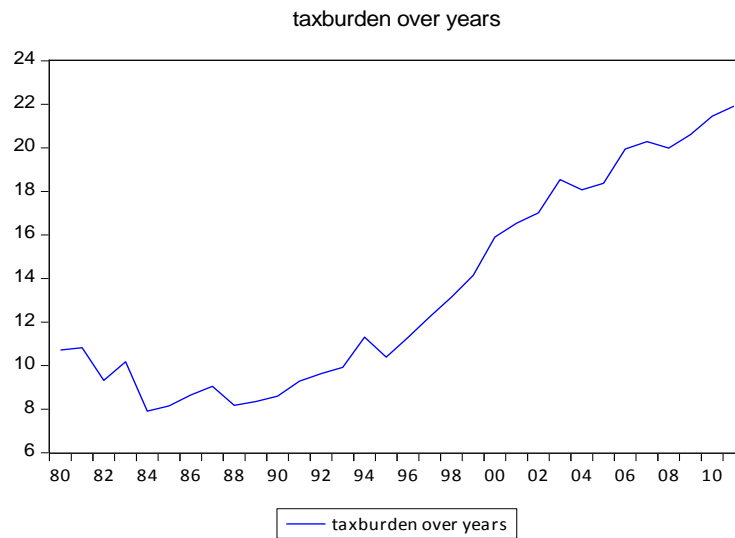


Figure1 Tax Burden in Turkey over Years

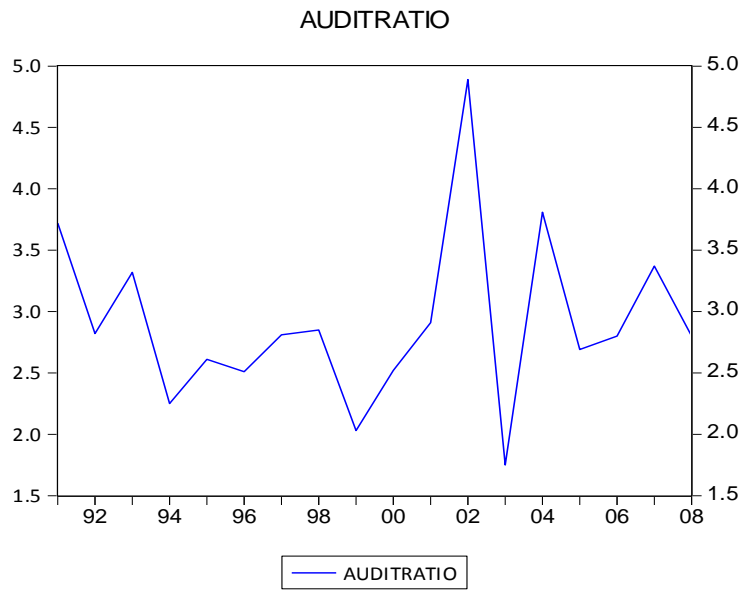


Figure2 Audit Ratio in Turkey over Years

In figure 1, tax burden is graphed over years, revealing gradual increase with exponential trend. Similar situation is apparent from figure 2 that control mechanism intensity did not raise over years as well since audit ratio implies the proportion of government audits on taxpayers. After 1999, audit ratio increases continuously; yet, it is not enough to create a sense of fear for tax evaders.

As for penalty increases, although it is seen that nonparticipants are declared to expose more severe punishments such as high interest rates or prosecution. However, there are not indicative arguments in the literature, claiming stringent penalties that are enough to attract the attention of evaders. Hence, even if penalties are increased considerably, it is far from being an effective measure since audit mechanism is not properly improved.

Turkish government suffers from lack of tax awareness as well. In previous section, tax awareness was attached importance in a sense that it is positively correlated with tax morale increases and so does tax compliance. In Turkey, however, tax awareness is very low indeed. Citizens are not even aware that tax is an obligation for the well being of their country. Oral and Sayın (2009) evaluates the awareness of citizens, claiming that the one of the reasons of frequent amnesty applications in Turkey is not constituting a healthy tax culture. Authors argue that people cannot apprehend the significance of taxes, which are basis for economical, sociological and cultural progress. According to Güner (1998), this devoidance of awareness is the reason why evaders do not feel social pressure, rather they are tolerated.

Tax morale is also low in Turkey among aware citizens since tax policy of the government is not regarded as effective and there is a perception of low institutional quality. Firstly, tax burden is not equally distributed in Turkey. Lost revenue due to evaders are tried to be collected from honest tax payers, which leads to uneven tax burden. Secondly, amnesties are repeated with high frequency, which also cause a sense of inequality from the side of honest payers. Thirdly, enforcements are not applied appropriately either due to lack of strong tax administration or necessary technological advancements. Fourthly, there are too much tax laws, which increase the complexity of the system and decrease the compliance. Fifthly, there is a perception that government spending is not implemented properly. Sixthly, economical limitations such as high tax rates and high inflation rates in combination with unfair tax laws lead citizens to evade. Lastly, there is consideration of high degree of corruption. Collectively, these weaknesses in the tax system lead to low morale and decrease the compliance among aware citizens. Amnesties in Turkey are deprived of the capacity to increase as well as tax morale owing to both insufficient enforcements and high recurrence rate.

The studies related to amnesties in Turkey mostly focus on the issue from a more qualitative structure. One of such studies is carried out by Savaşan (2006), with a special focus on 2003 amnesty called "*Tax Peace*", investigating the revenue effects of

particular amnesty program. The author concludes that long-term revenue implications of amnesty should be cautiously examined due to lowering compliance while revenue escalation occurs in the short term. Saraçoğlu and Çaşkurlu (2011) conduct a survey and argue that tax amnesties decrease the compliance. Similar arguments are made by İpek, Öksüz and Özkaya (2012), in their study of amnesty effects on compliance, stating that amnesty participants and nonparticipants display different attitudes and behaviors towards amnesty. Respondents from Edirne, Kırklareli, Çanakkale and Tekirdağ appeared to display diminishing compliance if they are not participated in the amnesty. Oral and Sayın (2009) empirically investigate the effects of corruption on revenues through Granger Causality and Cointegration tests and conclude that there is negative causal relation between corruption and revenue. Bağdigen and Beşkaya (2005) also discusses in their research of regression analysis between revenue and corruption that high degree of corruption is associated with alleviation in tax revenues.

2.2 Shadow Economy

Shadow economy is tried to be measured by almost every government and many academicians but it is like knowing the unknown since it is off the records and so complicated that various methods are built, yielding different results (see chapter 3 for detailed explanations of estimation methods) and there is no consensus in measuring it. One of the difficulties stems from its definition; today, yet there is no precise definition of shadow economy. According to a commonly used definition, shadow economy includes all unregistered economic activities, which contribute officially published Gross Domestic Product if the activities were registered. In another, shadow economy is defined as market based production of goods or services, legal or illegal, escapes from the detection of authorities (Smith, 1994). Since every definition has its own interpretation, the following table is constructed to indicate shadow economy activities in the broadest sense.

Table 2 Types of Shadow Economy Activities

Type of activity	Monetary Transactions		Non-monetary transactions	
ILLEGAL ACTIVITIES	Trade in stolen goods, drug dealing and manufacturing, prostitution, gambling, smuggling, fraud, human trafficking, drug trafficking, weapon trafficking		Barter of drugs, stolen goods, smuggling etc; producing or growing drugs for own use, theft	
	Tax evasion	Tax avoidance	Tax evasion	Tax avoidance
LEGAL ACTIVITIES	Unreported income for self-employment; wages, salaries and assets from unreported work related to legal goods and services	Employee discounts; fringe benefits	Barter of legal goods and services	all do it yourself work and neighbour help

Source: Schneider and Williams 2013

According to the table, shadow economy includes legal activities that are hidden from the authorities and illegal activities. In literature, studies are intense around shadow economy of legal goods and services.

Shadow economy is an important concern of governments since it brings many problems with it. Firstly, governments want to build a legal framework consisting of specialized institutions to regulate and control economic activities but when shadow economy is in action these institutions are skipped over and this causes that economic relationships deteriorate and governments may be late in taking preventive actions. In such situations, investors are reluctant to expand their businesses and also consumers may be afraid of deceiving and not protecting their rights. Secondly, a greater shadow economy means fewer taxpayers are disclosing their income or they are disclosing a smaller part of their true income. In that case, governments raise tax rates to gather certain amount of tax revenues. Therefore, governments seek policies to reduce

shadow economy but to be able to do that; the determinants of shadow economy must be understood well. The following section will give main ideas about it.

2.2.1 The Determinants of Shadow Economy

Understanding the determinants of shadow economy is very important for both measuring it and fighting against it. At first, if there is shadow economy, it means economic units in this economy are evading taxes and their tax compliance is low. Allingham and Sandmo (1972) claimed income tax evasion is all about its benefits and costs. Benefit from tax evasion is simply the tax rate and the costs are about deterrence measures that are probability of detection and penalties when evaders are caught. The authors did not take other potential factors into account like tax morale of individuals and other costs of deterrence measures like shame and damage on reputation. Loayza (1996) studied shadow economy in Latin American countries and he found three main causes of shadow economy, which are tax burden, labor market restrictions and strength, and efficiency of institutions. Also Kanninen (2004) studied some other factors like accessibility of public goods, tax morale and labor supply decisions and he found these factors also have significant effects on shadow economy. Therefore, the main causes of shadow economy are related to level of taxes, tax morale, deterrence measures, and intensity of regulations, institutional quality and public services.

Almost every study in literature says tax and social security contribution burdens are the main causes of shadow economy since they affect labor supply choices. As the difference between total labor cost and after tax earnings of employees gets bigger, employees have a bigger incentive to work in a shadow economy. Spiro (1993) indicated in his study for Canada that people turned to shadow economy due to economic difficulties and tax revenues fell substantially after an increase in tax rates in 1991. Tax and social security contribution burdens may be the main cause of shadow economy but it is not enough alone to decrease these burdens to fight with shadow

economy. Savaşan and Schneider (2007) also make supporting claims; suggesting that even major tax reforms with major tax rate deductions are insufficient in leading to a substantial decrease in shadow economy and such reforms are effective only in stabilizing current size of shadow economy. It is also shown that a huge reduction in the direct tax burden was not enough to trigger a decrease in shadow economy as other factors remain unchanged but this does not change the findings that tax and social security burdens are key factors affecting shadow economy.

According to the theory, deterrence measures have a certain negative effect on shadow economy but these effects could not be observed practically. Blackwell (2009) found very strong effects of deterrence measures in his experimental study. Andreoni (1998) also says deterrence measures have an important role in shadow economy but he found that the effects are small. This is probably due to hardships in finding relevant data. Feld (2007) indicates how difficult it is to obtain data about penalties, punishments even in Germany due to complex legal background. Feld also stated that penalties and punishments do not have a strong and consistent effect on shadow economy. Although penalties and punishments do not have a strong effect, probability of detection has a greater effect on shadow economy according to Pederson (2003) but there are still other studies that keep the effects of deterrence measures ambiguous.

Intensity of regulations also has a role in shadow economy. For example, strict and intense labor market regulations increase costs of labor and these costs are mostly reflected on employees. Thus, these regulations give people an incentive to work in the shadow economy. Johnson (1998) found significant empirical evidence in this case. Friedman (2000) also concludes similar results. As intensity and complexity of regulations get bigger, shadow economy gets larger.

Public services and institutions also have a great role on shadow economy and interaction between public services and tax rates is important too. This interaction may trigger dynamic effects. To exemplify, a greater shadow economy leads to less tax revenue and worse public services and this leads governments to raise tax rates first,

and then people to participate in shadow economy which leads to even less tax revenue. In this perspective, it seems miserable to defeat shadow economy but if right policies are used at the same time, there may be a chance. Johnson (1998) reports that countries with fewer tax rates, regulations and less corruption have smaller shadow economy and higher tax revenue. Quality of public institutions is significant to control corruption and bribery to make tax system more efficient. Quality and accessibility of public services is important since it affects the way people think about government expenditures. If public believes government spends tax revenue to serve public at right expenses, this leads to increase intrinsic motivation of public to pay taxes which is called 'tax morale'. Even if public institutions cannot provide better public services, if the expenditures seem fair and necessary, this makes tax morale increase too. In this respect, tax morale and public services and institutions are correlated. Schneider and Torgler (2009) concluded that tax morale affects shadow economy negatively. Feld and Larsen (2009) also found similar empirical evidences using their survey data.

After understanding the determinants of shadow economy, it must be measured and the contribution of the causes explained above must be figured out to create an effective policy. Unfortunately, measuring shadow economy is complicated and there is no just one true method.

2.2.2 How to Measure Shadow Economy

There are mainly three methods, which are direct approaches, indirect approaches and MIMIC (Multiple causes and Multiple Indicators) approach.

Direct approaches: Direct approaches are mostly based on surveys, questionnaires, interviews and tax auditing of individuals or firms and then results are used to construct shadow economy estimates. These approaches have some drawbacks. One is that reliability of results depends on willingness of respondents to collaborate and it is highly

probable to underestimate shadow economy since people do not declare everything that they want to conceal from authorities in the surveys or interviews. Another is that the method gives point estimate in a specific time so it is difficult to create time varying estimates. Also structure of surveys and questionnaires is important in success of these approaches. Since people do not confess their hidden activities, this approach gives a lower bound of shadow economy size.

Indirect approaches: Indirect approaches are based on relations between macroeconomic variables. Estimates can be obtained from i) GDP approach, ii) Employment approach, iii) Transactions approach and iv) Currency demand approach.

i) GDP approach: This approach is based on the difference between national income and national expenditures. In national accounting, GDP calculation is made by three methods and these methods give the same result. Income and expenditure methods are two of them. Shadow economy has lowest contribution to income method but it has a greater contribution to expenditure method so the difference between them could be seen as an indicator of shadow economy. If the income obtained by shadow economy is not spent in domestic markets, then the reliability of the method gets lower and this is the main drawback of the method.

ii) Employment approach: Assuming total labor force is constant, decline in participation of labor force can be seen as participating in shadow economy in this method. This method neglects workers working at both official and shadow economy. Also, it neglects the other reasons changing participation rate.

iii) Transaction approach: The approach assumes a constant relation between transactions in an economy and GDP of this country. That is why; the method incorporates Fisher's quantity equation under some assumptions about the velocity of money, the value of transactions and total nominal GDP ($M*V=p*T$). After finding total nominal GDP, it is simple to find shadow economy by subtracting official GDP from total nominal GDP. However, to derive the estimations, a base year must be chosen with no

shadow economy to calculate constant relation between transactions and GDP. Base year choice is a weakness of the method and also, data on transactions must be accurate and reliable to get good results but it is very difficult to record and get such data.

iv) Currency demand approach: The approach assumes shadow economy activities must be undertaken in the form of cash to stay off the records and not to leave a trace to the authorities so an increase in the shadow economy leads to increase in currency demand. The method also assumes the velocity of legal money is equal to the velocity of illegal money. The other assumption is that main cause of shadow economy is tax burden. By including other potential variables affecting currency demand such as interest rate and income per capita, Tanzi developed an econometric model given below in 1983.

$$\ln(C/M_2)_t = \beta_0 + \beta_1 * \ln(1+TW)_t + \beta_2 * \ln(WS/Y)_t + \beta_3 * \ln R_t + \beta_4 * \ln(Y/N)_t + \mu_t \quad (Eq.1)$$

In the model, 'ln' represents natural logarithm,

C/M₂ is the ratio of currency in circulation to broad money supply,

TW is the weighted average tax rate,

WS/Y is the ratio of wages and salaries to national income,

R is the interest rate paid to saving deposits,

Y/N is the income per capita,

After estimating coefficients, currency in circulation is calculated by imposing zero tax rates. The difference between estimated Currency in circulation amounts with and without tax rate is accepted as currency in circulation stemming from shadow economy. By multiplying this difference with the velocity of illegal money size of the shadow economy can be obtained. One drawback of the method is it accepts tax burden as only cause of shadow economy but there are some other factors too. Second is about the velocity of illegal money and some academicians state that the velocity of money in

official economy is already hard to find so the velocity of money in hidden economy is much more difficult to find.

After estimation of currency-money supply ratio, the calculation is made without tax burden meaning tax burden is set equal to zero and the difference between them is an indicator of currency demand to finance underground activities. At the same time, this difference shows the magnitude of tax evasion and it is called as illegal money in literature. Thus, legal money can be obtained by subtracting illegal money from money supply.

$$\text{Illegal Money} = CC_{\text{with tax burden}} - CC_{\text{without tax burden}} \quad (\text{Eq.2})$$

$$\text{Legal Money} = M_1 - \text{Illegal Money} \quad (\text{Eq.3})$$

Because it is assumed that velocity of legal money is equal to illegal money, the velocity illegal money can be calculated as follows.

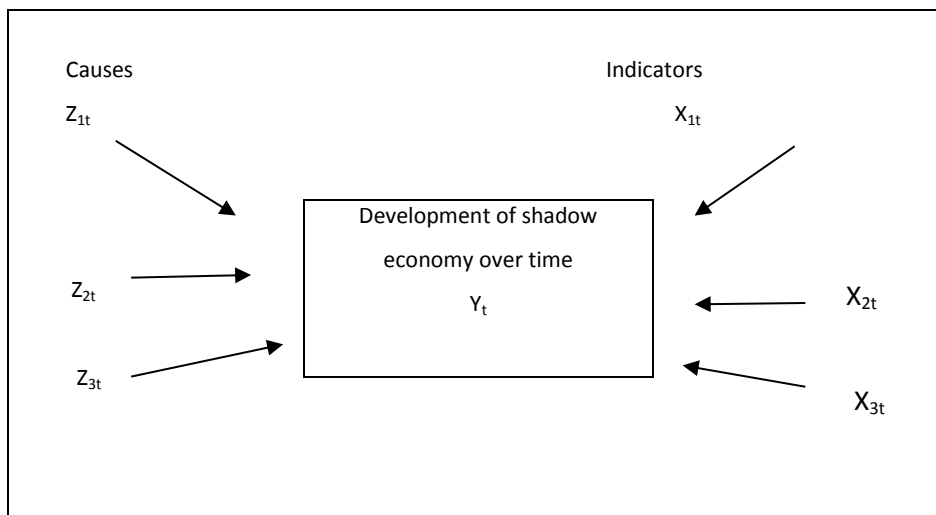
$$\text{Velocity of Legal Money} = \text{GDP current prices} / \text{legal money supply} \quad (\text{Eq.4})$$

After obtaining velocity of illegal money, shadow economy in current prices could be calculated by multiplying velocity and illegal money supply.

$$\text{Shadow Economy} = \text{Velocity} * \text{Illegal Money} \quad (\text{Eq.5})$$

MIMIC approaches: Different from other approaches, this approach takes many causes and indicators of shadow economy into account. Other methods explained so far takes tax burden as only cause of shadow economy and this is one of the biggest critique of other methods but MIMIC approach also called model approach considers every potential cause and effect of shadow economy. The method is based on statistical theory of unobserved variables and causes and effects of unobserved variable are considered. The degree of causal relations and coefficients of variables are estimated in

a set of structural equations in which unobserved variables cannot be measured directly. The method consists of two steps. In the first step, causes and indicators of shadow economy are determined and links between the observed variables and unobserved variables are created through measurement model. In the second step, structural equation then reports causal relationships between unobserved variables. In this case, unobserved variable is size of shadow economy.



Source: Schneider and Enste (2000)

Figure 3 Development of Shadow Economy

There is huge literature about causes and indicators of shadow economy and these are mostly explained before but just to be more specific, tax burden, burden due to regulations (intensity of regulations) and tax morale is taken as causes of shadow economy and monetary indicators like currency demand, labor market developments such as unemployment and working hours and development of production market like GDP growth rate are taken as indicators of shadow economy in this approach.

CHAPTER 3

DATA

In this part, data used in the study will be covered and since the thesis has two main parts, which are related to tax revenue and shadow economy, it is suitable to explain data in two sections.

3.1 Tax Revenue

While investigating the effects of tax amnesties on tax revenues, annual data covering the period between 1985 and 2009 is used. The reason that the study covers time span till 2009 is also lack of data because Revenue Administration has changed the content of audit statistics after 2009 in her annual reports. In tax revenue modeling, *GDP constant*, *inflation* and *seizures* variables are used as explanatory variables, which are described in the table 3 as well as their data sources.

Table 3 Description of Variables and Data Sources

Variables	
<i>GDP per capita</i>	Gross Domestic Product per capita in current prices with local currency unit
<i>GDP</i>	Gross Domestic Product in current prices with local currency unit
<i>GDP constant</i>	Gross Domestic Product in constant prices with local currency unit
<i>Unemployment rate</i>	Unemployment rate, total labor force
<i>Inflation rate</i>	Annual % change in consumer prices
<i>Interest</i>	Interest rate paid to saving deposits
<i>Δ ln(Interest)</i>	one time differenced natural logarithm of interest rate paid to saving deposits
	Source:World Bank
<i>Currency in Circulation(CC)</i>	Currency out of banks local currency unit
<i>Δ ln(CC)</i>	One time differenced natural logarithm of currency in circulation
<i>M1</i>	currency out of banks and demand deposits local currency unit
	Source:Central Bank of Turkey Republic
<i>Tax Burden</i>	Percentage share of tax revenues in GDP (tax revenue/ GDP)
<i>Δ ln(Tax Burden)</i>	one time differenced natural logarithm of tax burden
<i>Tax Revenue</i>	All tax income of government in current Local Currency Unit
<i>Δ ln(Tax Revenue)</i>	one time differenced natural logarithm of tax revenue
<i>Seizures</i>	The value of assets seized in tax audits in local currency unit
<i>Δ ln(Seizures)</i>	One time differenced natural logarithm of seizures
	Source:Revenue Administration, Author's categorizations
<i>Shadow</i>	Ratio of size of shadow economy to GDP as %
	Source: Schneider(2005,2012) and Author's estimations

3.2 Shadow Economy

To figure out the effects of tax amnesties on shadow economy, shadow economy is modelled and then the effects of tax amnesties are investigated. In modelling shadow economy, variables such as GDP per capita in current prices, unemployment, inflation, tax burden, seizures are controlled for. All variables used and their data sources are given in table 3. Two different data sets are used to estimate tax amnesty effects for robustness check purposes. One is taken from the studies of Schneider (2005, 2012). The authors' method of measuring shadow economy is MIMIC approach whose theoretical framework is explained in chapter 2.

Second set of estimations are based on currency demand model whose theoretical framework is given in chapter 2, and in this section, data, methodology and empirical results are covered. In currency demand model, GDP per capita, tax burden, interest rates on saving deposits, inflation are controlled for. The data and its sources are given in table 3.

Since currency-money supply ratio is assumed to be related to shadow economy activities, currency demand is estimated first, and then under certain assumptions shadow economy could be obtained. The estimation results are indicated in table 4.

Table 4 Estimation Results of Currency Demand

Dependent Variable: $\Delta \log(\text{Currency in Circulation})$	
Constant	0,35* (0,08)
Trend	-0,01* (0,00)
$\Delta \log(\text{tax burden})$	0,04*** (0,02)
Inflation	0,00* (0,00)
$\Delta \log(\text{Interest})$	-0,20* 0,07
<i>Observations</i>	26
<i>R-squared</i>	0,88

*significant at 1%, **significant at 5%, ***significant at 10%, standart errors in parentheses

After estimation of currency demand, other estimated variables through shadow economy are given in table 5.

The last column gives the shadow economy estimation and these values are used as the dependent variable in estimation of amnesty effects on shadow economy in the next section.

Table 5 Shadow Economy Estimation by Currency Demand Method

Years	CC*	CC**	Illegal Money (CC*-CC**)	Velocity	Shadow Economy	Ratio*** %
1987	2.196	2.159	36	9	327	0,44
1988	3.611	3.684	0	12	0	0,00
1989	6.210	6.290	0	12	0	0,00
1990	10.930	10.956	0	13	0	0,00
1991	18.285	17.807	478	15	6.988	1,11
1992	31.498	30.229	1.269	15	18.753	1,72
1993	54.442	51.620	2.822	16	46.115	2,33
1994	105.739	94.590	11.149	18	201.387	5,21
1995	188.591	175.303	13.288	21	283.474	3,65
1996	334.444	299.204	35.240	18	624.934	4,23
1997	609.660	524.246	85.415	21	1.781.002	6,18
1998	1.088.355	900.971	187.384	33	6.092.318	8,68
1999	1.798.785	1.427.350	371.435	25	9.354.022	8,94
2000	3.227.320	2.378.985	848.335	26	21.983.073	13,19
2001	4.476.158	3.212.131	1.264.026	22	27.472.628	11,44
2002	7.002.152	4.925.718	2.076.434	12	24.971.887	7,13
2003	10.286.019	6.785.933	3.500.086	13	45.963.500	10,11
2004	13.385.366	9.005.539	4.379.826	13	56.975.106	10,19
2005	16.831.033	11.180.480	5.650.553	9	48.303.733	7,44
2006	21.096.076	13.117.834	7.978.242	9	73.742.871	9,72
2007	24.780.191	15.186.154	9.594.037	10	93.240.226	11,06
2008	28.364.589	17.607.578	10.757.011	10	108.932.569	11,46
2009	34.787.676	21.036.647	13.751.029	8	113.313.001	11,90
2010	41.997.615	24.511.557	17.486.058	8	137.076.199	12,48
2011	48.257.492	27.619.940	20.637.552	8	167.257.860	12,89
2012	53.098.997	29.778.929	23.320.069	8	191.295.239	13,50

Thousand TL

CC*: Currency in circulation that is estimated

CC**: Currency in circulation that is estimated imposing zero tax burden

*** Shadow economy/ official (GDP current prices)

CHAPTER 4

EMPRICAL ANALYSIS

As stated before, Turkey offered a large number of amnesties since 1960. However, literature is devoid of a detailed statistical analysis of tax amnesties offered by Turkey. The prominent aim of this chapter is to unravel relationships of tax amnesties and tax revenues as well as shadow economy, by investigating the period between 1985 and 2010.

There is lack of sufficient data before 1985. Although limited data and literature constrain the study, certain results may be obtained through consulting econometric methods with time series analysis. This is the first empirical research about amnesty effects on shadow economy and tax revenue in Turkey, after the period of 1985. A different perspective is proposed through investigating causalities between variables, pre and post amnesty effects on revenues and shadow economy. Besides, revenue impacts of amnesties were studied only qualitatively before while shadow economy influences have not been studied before. Unraveling long run and short run relationships, this analysis could have an important place in Turkish amnesty literature.

4.1 Methodology

This section explains the estimates of the revenue and shadow economy effects of tax amnesties in Turkey since 1985, after controlling for other determinants of tax revenue and shadow economy.

To begin with, in order to estimate the effects of tax amnesties, the other determinants having control on tax revenue and shadow economy were inspected. Then, the effects of amnesties are estimated by the variables representing pre-amnesty, amnesty and post-amnesty years. As discussed in Chapter 2, tax amnesties were almost routinely implemented in Turkey and that is why amnesties were treated as anticipated.

Due to shortness of time series data, there is a need to use as parsimonious as possible specification to increase the accuracy of estimations. This creates the need to study many different specifications. In this respect, a general to specific approach was adopted, starting with the most unrestricted specification permitted by the data, restrictions were tested, in order to obtain the most parsimonious specification available where further restrictions are rejected.

In estimating tax revenue, gross domestic product in constant prices (*GDP constant*), inflation rate, and one indicator of enforcement effort which is the value of assets seized during search (*seizure*) are utilized. Other potential variables turn out to be insignificant.

All variables are imposed to normality and stationarity tests as well as trend analysis. Importance of these steps is explained in upcoming sections. After necessary adjustments on all series, models are specified through Ordinary Least Squares regression and the dummy variable behaviors are observed by using these models. Results of OLS regression are either confirmed or denied by ECM analysis as well.

4.2 Modelling Tax Revenue and Results

All the variables to be considered in the ultimate model are investigated in terms of their normalities at the same time with trend analysis. Whether variables include linear or quadratic trend is decided with the aid of Jarque Bera p-value and distribution comparison of variables. Normality of the variables is so essential for a model that may alter the whole result increasing the opportunity to commit either type 1 or type 2 errors, depending on the nature of the analysis as well as the nature of normality (Osbourne, 2002). Osbourne also claims that normality is very rare in education and psychology. It is already known that macro-economic variables do not generally show normal distribution and they are processed before analysis through using transformations such as taking differences, percentages, and logarithms in order to procure more linear relationships between variables.

Trend analysis also helps removing uncertainties such as seasonality. If variables include linear or quadratic trend, they must be detrended to improve the analysis. Trend and normality analysis is performed through comparison of jarque bera probabilities of variables as they are regressed with linear and quadratic trends. In general, series are considered to include trend if they have larger p-values when they are regressed with trend variable. Exceptions may appear; however, series can have quadratic trend even if Jarque Bera p-value points linear trend. All the trend components of detrended variables are observed for more accurate inferences with a little intuition. If trend component is linear as shown in figure 3, then it is assumed to have linear trend whereas quadratic trend is presumed when trend component is as in the figure 4. There is also a probability that some variables do not include trend component. There is one alternative to be considered; that is, even if a variable accommodates trend component, detrending is not accepted if it deviates from normality. Consequently, trend probabilities, Jarque Bera probabilities and observation of graphs together constitute decision criteria about whether variables have trend and if they have, what nature of the trend is and whether they should be detrended or not.

Table 6 Jarque Bera and Trend Probabilities of Variables

Variables	Jarque Bera Probabilities			Trend Probability	TSQR Probability
	With TSQR	With Trend	Without Trend		
GDP Constant	0.35	0.99**	0.37	0.00	0.00
Inflation	0.00	0.39	0.46*	0.00	0.00
Tax Revenue	0.46***	0.45	0.00	0.00	0.00
Seizures	0.00***	0.00	0.00	0.00	0.00

- *indicates inexistence of trend; **indicates existence of linear trend;
***indicates existence of quadratic trend

Except for *inflation* variable, all variables have linear or quadratic trend according to the results of Jarque Bera normality probabilities. Even if the trend probability seems significant, distribution and Jarque Bera probability of a variable indicate that there is no evidence of trend in the series. This situation holds for *GDP constant* where quadratic trend is unaccepted even if the probability of quadratic trend component is significant. From figure 3, it may be seen that *GDP constant* trend component is linear.

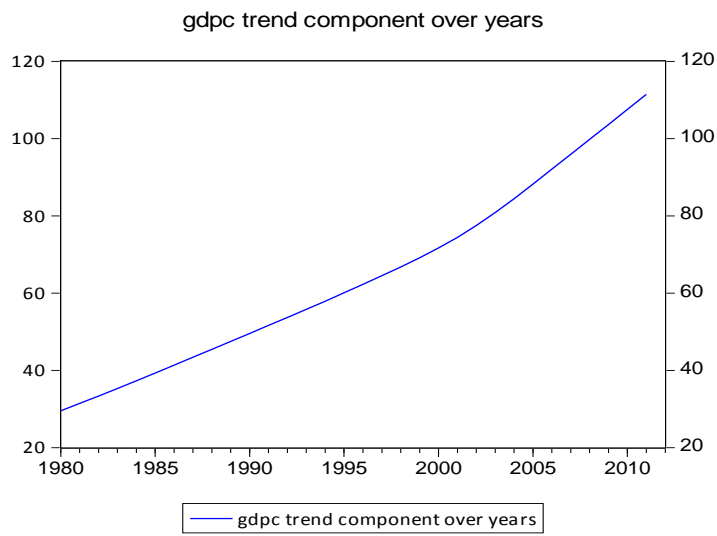


Figure 4 Linear Trend in Gdp Constant Variable

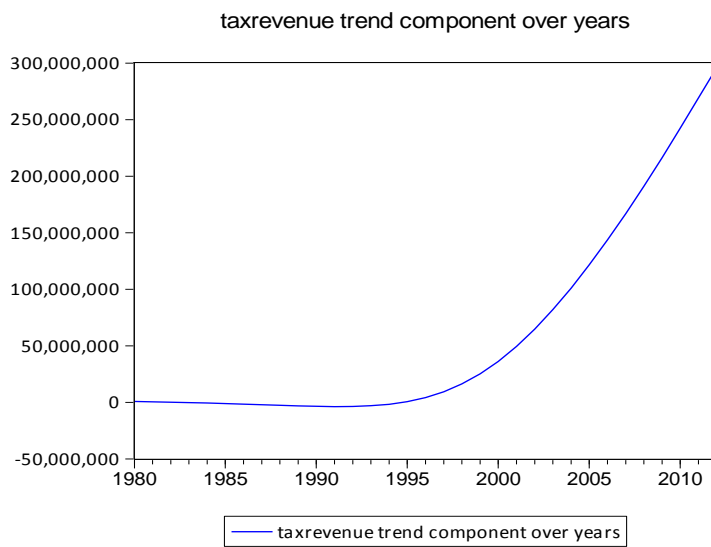


Figure 5 Quadratic Trend in Tax Revenue Variable

When trend is present in a series, it is necessary to run the regression with a trend series or to detrend series and run the regression thereafter. Since the variables to be observed include linear and quadratic trends, it is more accurate to detrend the series. In addition, including linear and quadratic trend series in regression diminishes the degrees of freedom by 2, which also decrease the robustness of the model because sample size is small already. Another important point is that variables have different number of observations and a common trend may cause misspecification. Therefore, *inflation* series remain as they are while *GDP constant*; *tax revenue* and *seizure* are to be detrended through making logarithmic transformations and differencing.

Table 7 Level and Logarithmic Normalities of Variables

Variables	Level Normality	Log Normality
Inflation	0,46	0,16
Seizure	0,00	0,38*
GDP constant	0,37	0,47
Tax revenue	0,00	0,18*

* Indicates normality in logarithmic form.

Normality analysis implies *seizures* and *tax revenue* are far from normality in their level forms. For this reason, they are used in their logarithmic forms in regressions. Other variables appear to be normal and it may be better to run the regression with their level forms. Hence, ADF and KPSS tests are implemented to level and logarithmic forms of *inflation* and *GDP constant* variables while they were applied to only logarithmic forms of *seizures* and *tax revenue*.

Stationarity check with *Augmented Dickey Fuller* (ADF) method needs to be implemented. Running a regression with stationary variables is so essential that may influence the outcome dramatically because significant results may be obtained when it is, indeed, insignificant. Thus, type 1 error becomes an issue unless the series are cointegrated. Obtaining significant results with this kind of implementation may be an

indication of ‘*spurious regression*’. R^2 being greater than Durbin Watson statistic is the symptom of spurious regression and caution is needed for progress since t-statistics are unreliable in this case. Importance of stationarity test also rises from the fact that most of the macroeconomic variables are nonstationary in their original form and they are usually used as logarithmic transformations.

For small samples, power of ADF test is low; hence, KPSS test is also used as a reinforcing factor to ADF results since it yields more accuracy compared to ADF for small samples. ADF null hypothesis states that series has a unit root; that is, it is nonstationary and it needs to be differenced, whereas Kwiatkowski–Phillips–Schmidt–Shin (KPSS) null hypothesis states that series is stationary. So, if KPSS statistic is lower than critical value at the %5 significance level, it may be deduced the series is stationary. Table 5 shows the results of ADF and KPSS tests carried on levels and logarithmic forms of variables, suggesting stationarity of inflation and *number of seizure* in level form while *seizures*, *GDP constant*, *unemployment*, *tax burden*, *tax rate*, *tax revenue* and *shadow* variables are stationary when they are differenced.

Table 8 Stationarity Test Results of Variables

Variables	Level		1st Difference		2nd Difference	
	ADF	KPSS	ADF	KPSS	ADF	KPSS
Inflation	0.03*	0.15	0.00*	0.12*		
GDP constant	1.00	0.16	0.00*	0.40*		
Log(GDP constant)	0.17	0.12*	0.00*	0.15*		
Log(Tax revenue)	0.02*	0.15	0.23	0.18	0.00*	0.17*
Log(Seizure)	0.33	0.16	0.00*	0.35*		
Log(Inflation)	0.13	0.17	0.00*	0.11*		

-KPSS critical values for %5 are 0.146

-*indicates that test statistic or p-value display stationarity.

Hence, variables are removed from the trend and normality problems through logarithmic transformations and differencing in order to start with the modeling.

As a result of OLS regression, all independent variables appeared to be individually significant in the model as their relative p values are less than 0.01. F-statistic probability of **0.00** suggests all the variables are jointly significant and influence the dependent variable. According to the model, GDP constant, inflation and seizures have significant effect on tax revenue with expected signs namely GDP constant, inflation and seizures positively affect tax revenue. Since variables are in logarithmic and difference forms, it is harder to determine the effects of each variable on tax revenue in comparison to log-log model in which the coefficients give elasticities. Due to forms of variables, the amounts of effects are changing every year so a base year has to be selected to evaluate the effects. If 2008 is taken as base year, one point increase in inflation and 1% increase in GDP constant meaning 1% economic growth results in 0,66% and 0,4% increase in tax revenue respectively. Also, 1% increase in seizures leads to 0,1% increase in tax revenue. Significance of seizure variable implies that tax compliance is low and people hides their income or they mistakenly disclose less income and tax authority finds wrong disclosures and makes additional tax collections. The following figure gives an idea about relation between disclosed income and true income of taxpayers in Turkey. As also revealed in figure 6, tax payers in Turkey has an incentive to disclose less income than they have in real and according to the data obtained from results of tax audits and investigations; tax payers hide 40% of their income in disclosures.

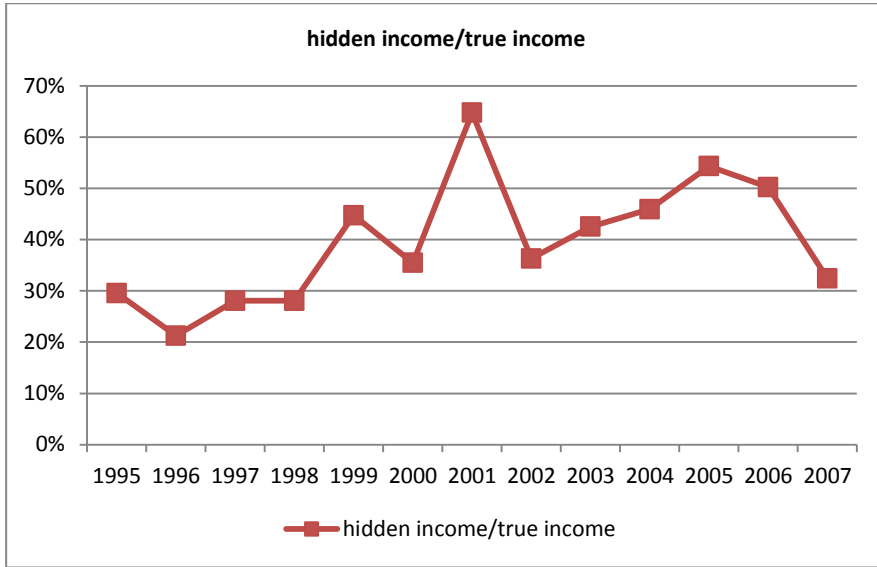


Figure 6 Ratio of Hidden Income over True Income in Turkey

Table 9 OLS Estimation Results of Amnesty Effects on Tax Revenue

Dependent variable: $\Delta \log(\text{Tax Revenue})$	1	2	3	4	5	6	7	8	9	10
Constant	0.03 (0.03)	0.03 (0.03)	0.03 (0.03)	0.03 (0.03)	0.04 (0.03)	0.03 (0.03)	0.04 (0.03)	0.03 (0.03)	0.03 (0.03)	0.04 (0.03)
Inflation	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)
Δ GDP constant	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)
$\Delta \log(\text{Seizures})$	0.10** (0.03)	0.10* (0.03)	0.10* (0.03)	0.10* (0.03)	0.10* (0.03)	0.10* (0.03)	0.10* (0.03)	0.10* (0.03)	0.10* (0.03)	0.10* (0.03)
Dummy 1988	-0.01** (0.03)	-	-	-	-	-	-	-	-	-
Dummy 1989	-	0.06** (0.04)	-	-	-	-	-	-	-	-
Dummy 1990	-	-	0.01	-	-	-	-	-	-	-
Dummy 1992	-	-	-	0.01 (0.06)	-	-	-	-	-	-
Dummy 1997	-	-	-	-	0.03 (0.06)	-	-	-	-	-
Dummy 1998	-	-	-	-	-	-0.05 (0.06)	-	-	-	-
Dummy 2001	-	-	-	-	-	-	-0.02 (0.06)	-	-	-
Dummy 2002	-	-	-	-	-	-	-	-0.04 (0.06)	-	-
Dummy 2003	-	-	-	-	-	-	-	-	0.03 (0.04)	-
Dummy 2008	-	-	-	-	-	-	-	-	-	-0.03 (0.06)
<i>Observations</i>	24	24	24	24	24	24	24	24	24	24
<i>R-squared</i>	0.95	0.95	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94

* significant at 1% **significant at 5% ***significant at 10%, Standart errors in parentheses

Table 10 OLS Estimation Results of Pre-amnesty Effects on Tax Revenue

Dependent variable: $\Delta \log(\text{Tax Revenue})$	1	2	3	4	5	6	7	8	9	10
Constant	0.03 (0.03)	0.04 (0.03)	0.03 (0.03)	0.03 (0.03)	0.04 (0.03)	0.04 (0.03)	0.04 (0.03)	0.04 (0.03)	0.03 (0.03)	0.04 (0.03)
Inflation	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)
Δ GDP constant	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)
$\Delta \log(\text{Seizures})$	0.10* (0.03)	0.08** (0.03)	0.10* (0.03)	0.10* (0.03)	0.10* (0.03)	0.10* (0.03)	0.09* (0.03)	0.10* (0.03)	0.10* (0.03)	0.10* (0.03)
Dummy 1988	-0.02 (0.06)	-	-	-	-	-	-	-	-	-
Dummy 1989	-	-0.10** (0.06)	-	-	-	-	-	-	-	-
Dummy 1990	-	-	0.01 (0.06)	-	-	-	-	-	-	-
Dummy 1992	-	-	-	0.05 (0.06)	-	-	-	-	-	-
Dummy 1997	-	-	-	-	0.04 (0.06)	-	-	-	-	-
Dummy 1998	-	-	-	-	-	0.03 (0.06)	-	-	-	-
Dummy 2001	-	-	-	-	-	-	0.04 (0.06)	-	-	-
Dummy 2002	-	-	-	-	-	-	-	-0.02 (0.06)	-	-
Dummy 2003	-	-	-	-	-	-	-	-	-0.04 (0.06)	-
Dummy 2008	-	-	-	-	-	-	-	-	-	-0.06 (0.06)
<i>Observations</i>	24	24	24	24	24	24	24	24	24	24
<i>R-squared</i>	0.95	0.96	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95

* significant at 1% **significant at 5% ***significant at 10%, Standart errors in parentheses

Table 11 OLS Estimation Results of Post-amnesty Effects on Tax Revenue

Dependent variable: $\Delta \log(\text{Tax Revenue})$	1	2	3	4	5	6	7	8	9	10
Constant	0.03 (0.03)	0.03 (0.03)	0.04 (0.03)	0.03 (0.03)	0.03 (0.03)	0.02 (0.03)	0.03 (0.03)	0.03 (0.03)	0.03 (0.03)	0.05 (0.03)
Inflation	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)
Δ GDP constant	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)
$\Delta \log(\text{seizures})$	0.11* (0.03)	0.10* (0.03)	0.09* (0.03)	0.10* (0.03)	0.10* (0.03)	0.13* (0.03)	0.10* (0.03)	0.10* (0.03)	0.10* (0.03)	0.10* (0.03)
Dummy 1988	-0.11*** (0.05)	-	-	-	-	-	-	-	-	-
Dummy 1989	-	0.03 (0.04)	-	-	-	-	-	-	-	-
Dummy 1990	-	-	0.04 (0.06)	-	-	-	-	-	-	-
Dummy 1992	-	-	-	0.06 (0.06)	-	-	-	-	-	-
Dummy 1997	-	-	-	-	-0.05 (0.06)	-	-	-	-	-
Dummy 1998	-	-	-	-	-	0.10 (0.06)	-	-	-	-
Dummy 2001	-	-	-	-	-	-	-0.04 (0.06)	-	-	-
Dummy 2002	-	-	-	-	-	-	-	0.04 (0.06)	-	-
Dummy 2003	-	-	-	-	-	-	-	-	0.01 (0.06)	-
Dummy 2008	-	-	-	-	-	-	-	-	-	-0.06 (0.07)
<i>observations</i>	24	24	24	24	24	24	24	24	24	24
<i>R-squared</i>	0.95	0.94	0.94	0.94	0.94	0.95	0.94	0.94	0.94	0.94

* significant at 1% **significant at 5% ***significant at 10%, Standart errors in parentheses

Model is controlled to determine if it is good enough to make analysis. Breusch-Pagan-Godfrey probability of 0.11 proves homoscedasticity of the residuals. Serial correlation test also proposes no serial correlation since Breusch-Godfrey LM Chi-Square probability is 0.31, which is higher than %5 at the optimal lag length of 1.

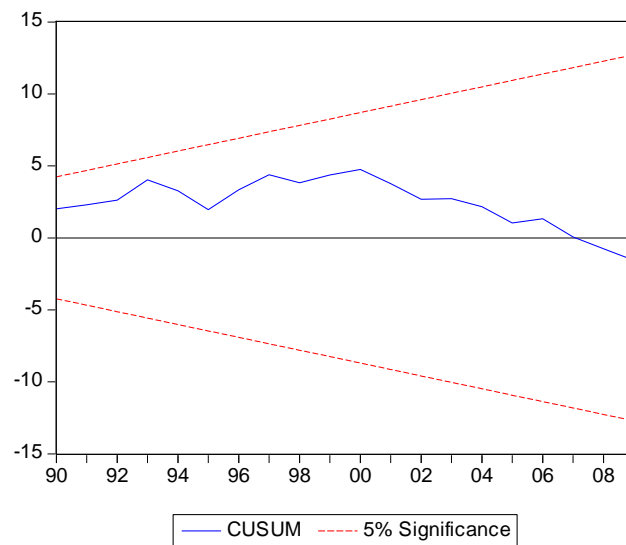


Figure 7 Cusum Test on Tax Revenue

In CUSUM test, the dependent variable is stable in if CUSUM line lies within the band in 5 % significance level. Hence, there is no problem regarding the stability as well. Finally, Jarque Bera probability of 0,54 indicates normal distribution of residuals. Moreover, R^2 of 95 % is a good indication for the model. Consequently, the model is accepted as a good model and may be processed further.

Dummy variables are introduced to the model one by one in order to see the effects of each separately. In addition, separate analysis relieves the loss of degrees of freedom, which is limited by the small number of observations already. Results are provided in

table 9, suggesting that only the amnesty in 1988 had a significant effect on tax revenues at 5% significance level while the direction of impact is not in line with the aim of the amnesty. Decrease in tax revenue in amnesty year is revealed by the negative coefficient of particular dummy variable. Even if it is most probably temporary, tax revenue escalation is expected in the amnesty year; contrary to the results. This effect can be explained by two reasons; 1989 amnesty practice and the nature of OLS. Firstly, the government applied an amnesty in 1989, just after the one in 1988 and it was previously stated that the citizens anticipate amnesties in Turkey. Hence, unless additional collections from the amnesty are sufficient to dominate the negative effect of evasion due to anticipated following amnesty, revenues may decline. Secondly, OLS takes the average of previous year's values as well and cumulative negative effect may have also offset the impact of collections. Similar conclusion can be drawn by the post effect of 1988 amnesty and 1989 amnesty. Positive coefficients are significant at even 5% significance level; indicating revenue increase either due to the after effect of 1988 amnesty or collections from 1989 amnesty. It is more reasonable to dedicate this increase to the collections coming from 1989 amnesty rather than compliance enhanced effects of 1988 amnesty because it is discussed that 1988 amnesty was insufficient to increase collections in that year while the effect is mostly offset by the pre effect of 1989 amnesty. Moreover, 1989 amnesty includes terms for foundations as well, so it is more comprehensive and this may also have influenced the collections positively.

Other than 1988 and 1989 amnesties, none of the amnesty practices significantly influence tax revenue. That may be due to the perception of amnesties as routine practices in Turkey by the citizens. Hence, their reactions remain unimportant to cause large revenue changes. Despite their insignificance, signs of the coefficients may be indicative in terms of revenue effects. It is seen from tables 10 and 11 that post effect of 2001 amnesty and pre effect of 2003 amnesty coincide with 2002 amnesty and they have decreasing effect on tax revenue. Post effects are negative for only 1997, 2001 and 2008 amnesties. However, it is not enough to make deductions about positive post

impacts of other amnesties since they overlap with other subsequent amnesty effects. Due to high frequency, amnesty effects are ambiguous and it is hard to make accurate inferences about which amnesty has more pronounced effect. Only 2008 amnesty has negative effects on all of the before, after and amnesty years. Five years after the last amnesty, 2008 amnesty is practiced whereas this time span is insufficient to make the amnesty unanticipated. Not overlapping with any other amnesty, 2008 amnesty also declined revenues in the year of its practice. This may be due to the terms of amnesty that include black asset declarations and time horizon of the amnesty. In explaining tax amnesties in chapter 2, it was stated that an amnesty should be followed by strong enforcements in order to be successful. Due to lack of such enforcements, black asset declarations is hard to increase since people with black assets need more convincing conditions. Moreover, time horizon for amnesty is very limited, which is only 1 month. Hence, it is reasonable to expect decline in revenues in 2008 due to previous negative anticipation effects and deprivation of amnesty success factors in the year of practice. Collectively, amnesties are far from being a part of effective tax reforms in Turkey. High frequency of implementation, lack of effective enforcements and compliance reductions are main reasons for ineffective amnesties of Turkey.

Next step is to test whether cointegration between variables exist or not. One way to do so is to conduct unit root test on residuals of the regression to see if residuals are stationary. Stationarity of the residuals suggests cointegration. ADF and KPSS results prove stationarity of the residuals with the probability of 0.0309, and statistic of 0.3284 respectively. Furthermore, Johansen Cointegration test is applied to reinforce cointegration presence and both trace probabilities and Max-eigen probabilities demonstrate 1 cointegrating equation is existent at 5 % significance level. Thus, the model possesses no problem in estimating '*Error Correction Model*' so as to figure out short run and long run relationships from independent variables to tax revenue. Cointegration test indicates long run relationship between variables; however, it fails to signify the direction of causality. Hence, ECM is performed to observe behaviors of individual amnesties on tax revenues.

Optimal lag length should be 1 according to Akaike, Hannan Quinn and Schwarz information criteria.

Autoregressive coefficient in ECM implies long run relationship from independent variables to dependent variable if it is significant and negative. After regression, it appeared to be negative as -0.49, and significant at 10% significance level as corresponding p value is 0.10. In light of these findings, it is concluded that there is long run relationship to tax revenue from independent variables.

After inserting dummy variables in ECM model one by one for a better specification due to degrees of freedom concerns, corresponding results are obtained as shown in table 12.

Table 12 ECM Estimation Results of Amnesties on Tax Revenue

Dummy Variable	pre-amnesty	amnesty	post-amnesty
Dummy 1988	-	0.23 (0.13)	0.05 (0.16)
Dummy 1989	0.23 (0.13)	0.00 (0.10)	0.04 (0.08)
Dummy 1990	-0.03 (0.13)	-0.03 (0.13)	-0.05 (0.13)
Dummy 1992	0.07 (0.11)	0.02 (0.11)	0.04 (0.11)
Dummy 1997	0.01 (0.14)	0.08 (0.12)	-0.06 (0.11)
Dummy 1998	0.08 (0.12)	-0.06 (0.11)	-0.17 (0.10)
Dummy 2001	-0.05 (0.13)	-0.09 (0.13)	0.05 (0.13)
Dummy 2002	-0.09 (0.13)	0.05 (0.13)	-0.07 (0.12)
Dummy 2003	0.05 (0.13)	-0.07 (0.12)	-0.14 (0.11)
Dummy 2008	-0.09 (0.11)	-0.01 (0.11)	-0.11 (0.11)
<i>Observations</i>	22	22	22

-standard errors in parenthesis. *significant at 1%, **significant at 5%, ***significant at 10%,

Table 12 suggests that none of the amnesties appeared to have a significant effect on tax collections except for the amnesty in 1988; which significant at 10% significance level; therefore, it may be beneficial to examine pre and post amnesty influences of 1988 amnesty with special emphasis during investigation of pre and post amnesty influences. To examine the short run effect of Dummy 1988, Wald restriction test is also applied and 0.09 chi square probability is obtained; rejecting the null hypothesis of in-existent short run causality at 10% significance level. Besides, autoregressive coefficient is significant at 5% significance level with the p value of 0.03 and with the value of -0.89; indicating long run relationship from the dummy variable to tax revenue. Hence, 1988 amnesty may be effective in revenue increases in both the long run and short run due to its positive coefficient, contradicting with negative OLS results.

Pre and post amnesty affects will be observed substantially for the purpose of procuring results about anticipation and efficiency of particular amnesty. It is known from what was previously stated that amnesties in Turkey have been a routine since 1980s; hence, it is assumed that amnesties are anticipated, and declines in tax revenue in a year before of amnesties are expected while no additional increases in revenue a year after amnesties are expected.

Results indicate that amnesties had no effect on tax revenue just before the year of implementation. It may be either due to pursuing an inefficient way to declare amnesties or citizens get so immune to amnesties that they do not reveal any reactions to cause significant changes in revenues. Although they are statistically insignificant, pre amnesty coefficients of the years 1988, 2002, 2003 and 2008 have negative values; proposing that revenues declined before the years of amnesties. Hence, these amnesties may be interpreted as to be in line with expectations about whether they are anticipated. As for post amnesty effects, only 1988 amnesty yield significant result at 10% significance level, with a coefficient of 0.11; indicating that revenue increase was fulfilled after the amnesty, in agreement with OLS results. Revenue decrease was observed after amnesties of 1997, 2001 and 2008, as it can be deducted from negative coefficients. Other amnesties seem to have little positive effect on revenue after a year, while the increases are statistically insignificant. All results of ECM and OLS except for 1988 amnesty year effect are consistent. Different sign of 1988 amnesty coefficient may be due to limited number of observations, which is essential especially for ECM since it includes differenced variables and lag values of variables, decreasing the degrees of freedom. That is also the reason why pre amnesty effect of 1988 amnesty cannot be analyzed in ECM. Aggregately, ECM results are confirmative to OLS results and overall estimations lead the conclusion that amnesties in Turkey are ineffective in escalation of tax revenue.

4.3 Modelling Shadow Economy and the Empirical Results

As it is discussed in chapter 3, two methods of shadow estimation are used for the modeling of shadow economy; which are currency demand and MIMIC approaches. First step of modeling is to check stationarities of the variables with ADF and KPSS tests. Integration order is determined according to the agreement of both tests although they may yield differing results for level forms of some variables. Since variables have integration order of either zero or one, a model can be applied with the level forms of variables for simplicity if cointegration is present in the resulting regression. Cointegration may be confirmed by stationarity of the residuals that come from the resulting regression. Hence, if all the variables are at most integrated of order one and residuals of the regression is stationary, the model could be accepted for simplicity to process further. ADF and KPSS tests propose all the variables except *seizures* (which is integrated of order zero) are integrated of order 1; allowing to run the regression in levels.

For the first specification of shadow economy size with currency demand approach, residuals of the OLS regression is proved to be stationary with 0,01 ADF probability; therefore, cointegration is existent in the model which is an indication of long run relationship between *GDP per capita*, *unemployment*, *tax burden* and *shadow* variables. Jarque Bera probability is 0,83; revealing that residuals are normally distributed and the model is free from normality problem. Serial correlation LM test yields 0,06 probability, not rejecting the null hypothesis of no serial correlation. So, there is no autocorrelation problem as well. Homoscedasticity is also not rejected with 0,12 probability, coming from Breusch-Pagan-Godfrey test. As for stability, Cusum line lies within the bands, proving stability of the dependent variable. R^2 of the model is 0,93. Aggregately, the model meets the good model criteria and can be processed further.

Table 13 Stationarity Tests of Shadow Variables

Variables	Level		1st Difference	
	ADF	KPSS	ADF	KPSS
Inflation	0.31	0.16*	0.00*	0.14*
Tax burden	0.21	0.12	0.00*	0.22*
Interest	0.55	0.17*	0.00*	0.21*
GDP per capita	0.98	0.56	0.01*	0.23*
Shadow (MIMIC estimation)	0.72	0.32	0.00*	0.17*
Shadow (Currency Demand estimation)	0.26	0.14*	0.00*	0.30*

*indicates stationarity

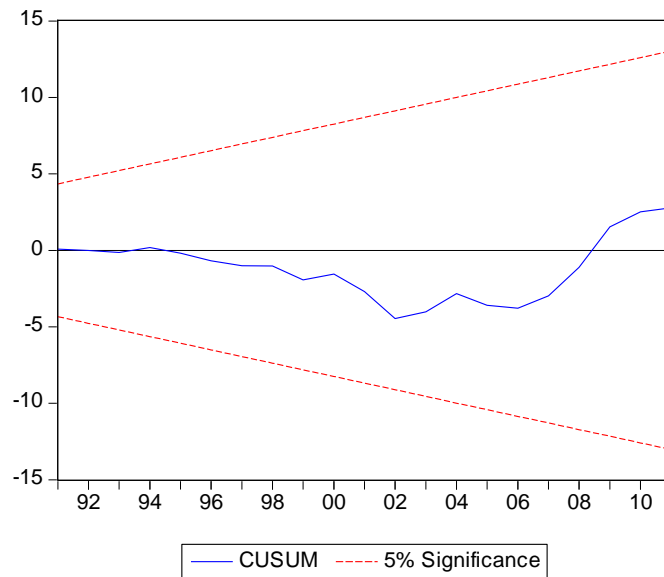


Figure 8 Cusum Test on Shadow Economy (Currency Demand Approach)

Table 14 Estimation Results of Tax Amnesties and the Shadow Economy (Currency Demand Approach)

Dependent variable: Shadow	1	2	3	4	5	6	7	8	9	10
Constant	-6.81** (2.88)	-6.68** (2.89)	-6.31** (2.91)	-6.63** (2.86)	-6.55** (2.87)	-6.90** (2.80)	-6.27** (2.86)	-8.70* (2.75)	-7.48** (3.02)	-6.90** (2.84)
Tax Burden	0.72* (0.09)	0.73* (0.09)	0.71* (0.08)	0.72* (0.08)	0.73* (0.08)	0.71* (0.08)	0.70* (0.09)	0.76* (0.08)	0.74* (0.08)	0.72* (0.08)
Unemployment	0.16** (0.06)	0.16** (0.06)	0.16** (0.06)	0.16** (0.06)	0.16** (0.06)	0.15** (0.06)	0.16** (0.06)	0.13** (0.05)	0.16** (0.06)	0.16** (0.06)
GDP per capita	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)	0.00*** (0.00)	0.00* (0.00)	0.00** (0.00)	0.00** (0.00)
Dummy 1988	0.55 (1.44)	-	-	-	-	-	-	-	-	-
Dummy 1989	-	0.15 (1.43)	-	-	-	-	-	-	-	-
Dummy 1990	-	-	-0.70 (1.41)	-	-	-	-	-	-	-
Dummy 1992	-	-	-	-0.07 (1.38)	-	-	-	-	-	-
Dummy 1997	-	-	-	-	-0.33 (1.40)	-	-	-	-	-
Dummy 1998	-	-	-	-	-	1.34 (1.38)	-	-	-	-
Dummy 2001	-	-	-	-	-	-	1.01 (1.41)	-	-	-
Dummy 2002	-	-	-	-	-	-	-	-2.78** (1.31)	-	-
Dummy 2003	-	-	-	-	-	-	-	-	-1.11 (1.44)	-
Dummy 2008	-	-	-	-	-	-	-	-	-	0.13 (1.36)
<i>Observations</i>										
<i>R-squared</i>										

* significant at 1% **significant at 5% ***significant at 10%, Standart errors in parentheses

Table 15 Estimation Results of Pre effects of Tax Amnesties on Shadow Economy (Currency Demand Approach)

Dependent variable: Shadow	1	2	3	4	5	6	7	8	9	10
Constant	-6.36** (2.86)	-6.81** (2.88)	-6.68** (2.89)	-6.53** (2.87)	-6.09** (2.86)	-6.55** (2.87)	-6.94** (2.63)	-6.27** (2.86)	-8.70* (2.75)	-6.52** (2.82)
Tax Burden	0.72* (0.16)	0.72* (0.17)	0.71* (0.17)	0.71* (0.16)	0.71* (0.16)	0.72* (0.16)	0.71* (0.15)	0.70* (0.17)	0.72* (0.15)	0.72* (0.16)
Unemployment	0.16** (0.07)	0.16** (0.06)	0.16** (0.06)	0.16** (0.06)	0.16** (0.06)	0.16** (0.06)	0.16*** (0.06)	0.16** (0.06)	0.16** (0.05)	0.16** (0.06)
GDP per capita	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)	0.00* (0.00)	0.00* (0.00)	0.00** (0.00)	0.00*** (0.00)	0.00* (0.00)	0.00** (0.00)
Dummy 1988	-0.83 (1.38)	-	-	-	-	-	-	-	-	-
Dummy 1989	-	0.55 (1.44)	-	-	-	-	-	-	-	-
Dummy 1990	-	-	0.15 (1.43)	-	-	-	-	-	-	-
Dummy 1992	-	-	-	-0.40 (1.39)	-	-	-	-	-	-
Dummy 1997	-	-	-	-	-1.24 (1.38)	-	-	-	-	-
Dummy 1998	-	-	-	-	-	-0.33 (1.40)	-	-	-	-
Dummy 2001	-	-	-	-	-	-	2.69*** (1.42)	-	-	-
Dummy 2002	-	-	-	-	-	-	-	1.01 (1.41)	-	-
Dummy 2003	-	-	-	-	-	-	-	-	-2.78** (1.31)	-
Dummy 2008	-	-	-	-	-	-	-	-	-	-0.98 (1.38)
<i>Observations</i>	25	25	25	25	25	25	25	25	25	25
<i>R-squared</i>	0.93	0.93	0.93	0.93	0.94	0.93	0.95	0.94	0.95	0.93

* significant at 1% **significant at 5% ***significant at 10%, Standart errors in parentheses

Table 16 Estimation Results of Post Effects of Tax Amnesties on Shadow Economy (Currency Demand Approach)

Dependent variable: Shadow	1	2	3	4	5	6	7	8	9	10
Constant	-6.68** (2.89)	-6.31** (2.91)	-6.53** (2.87)	-6.60** (2.85)	-6.90** (2.80)	-6.53** (2.84)	-8.70* (2.75)	-7.48** (3.02)	-6.58** (2.88)	-2.99 (2.75)
Tax Burden	0.72* (0.17)	0.71* (0.16)	0.72* (0.16)	0.72* (0.16)	0.72* (0.16)	0.71* (0.16)	0.73* (0.15)	0.73* (0.17)	0.72* (0.16)	0.71* (0.14)
Unemployment	0.16** (0.06)	0.16** (0.06)	0.16** (0.06)	0.16** (0.06)	0.15** (0.06)	0.16** (0.06)	0.15** (0.06)	-0.16** (0.06)	-0.16** (0.06)	0.25* (0.06)
GDP per capita	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)	0.00* (0.00)	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)
Dummy 1988	0.15 (1.43)	-	-	-	-	-	-	-	-	-
Dummy 1989	-	-0.70 (1.41)	-	-	-	-	-	-	-	-
Dummy 1990	-	-	-0.40 (1.39)	-	-	-	-	-	-	-
Dummy 1992	-	-	-	0.48 (1.39)	-	-	-	-	-	-
Dummy 1997	-	-	-	-	1.34 (1.38)	-	-	-	-	-
Dummy 1998	-	-	-	-	-	0.76 (1.39)	-	-	-	-
Dummy 2001	-	-	-	-	-	-	-2.78** (1.31)	-	-	-
Dummy 2002	-	-	-	-	-	-	-	-1.11 (1.44)	-	-
Dummy 2003	-	-	-	-	-	-	-	-	0.21 (1.37)	-
Dummy 2008	-	-	-	-	-	-	-	-	-	0.87** (0.27)
<i>Observations</i>	25	25	25	25	25	25	25	25	25	25
<i>R-squared</i>	0.93	0.93	0.93	0.93	0.93	0.94	0.95	0.94	0.93	0.94

* significant at 1% **significant at 5% ***significant at 10%, Standart errors in parentheses

In the model of shadow economy using data came from currency demand method (first specification), the effects of three variables which are *GDP per capita*, *tax burden* and *unemployment* are controlled for. A measure of deterrence, *seizures*, turned out to be insignificant in the model. In fact, there are other factors like institutional quality, intensity of regulations but lack of data leads to this model. The variables in the model have expected signs. GDP per capita is a proxy of development and an increase in GDP per capita leads to a decrease in shadow variable (ratio of shadow economy to GDP). In literature, tax burden has a positive effect on shadow economy and it is confirmed by the model. The other variable, unemployment, also positively affects shadow economy as expected. According to the model, one point increase in tax burden and unemployment results in 0,72 and 0,16 point increase in relative share of shadow economy respectively. One thousand TL increase in GDP per capita makes ratio of shadow economy decrease by 0,34 point. Also, constant is significant and has a negative value. This means there is negative shadow economy when all other variables have a value of zero but this does not make sense so it can be deduced that there is highly likely omitted variables in the model. Although the model should include other potential variables, due to lack of data, explained model will be kept and used in amnesty analysis.

Table 17 Estimation Results of Tax Amnesties on Shadow Economy (MIMIC Approach)

Dependent variable: Shadow	1	2	3	4	5	6	7
Constant	-0.03 (0.13)	0.01 (0.13)	0.06 (0.12)	0.00 (0.13)	0.04 (0.14)	-0.01 (0.13)	-0.04 (0.11)
Tax Burden	0.30* (0.05)	0.29* (0.05)	0.29* (0.05)	0.29* (0.05)	0.29* (0.05)	0.29* (0.05)	0.29* (0.05)
GDP per capita	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)
Unemployment	0.10*** (0.06)	0.10*** (0.06)	0.10** (0.06)	0.10*** (0.06)	0.10 (0.0)	0.10*** (0.06)	0.10** (0.05)
Seizures	-0.00 (0.01)	-0.00*** (0.01)	-0.00** (0.01)	-0.00*** (0.01)	-0.00*** (0.01)	-0.00*** (0.01)	-0.00** (0.01)
Dummy 1992	0.02 (0.02)	-	-	-	-	-	-
Dummy 1997	-	0.01 (0.02)	-	-	-	-	-
Dummy 1998	-	-	0.04 (0.02)	-	-	-	-
Dummy 2001	-	-	-	-0.01 (0.02)	-	-	-
Dummy 2002	-	-	-	-	-1.41*** (0.82)	-	-
Dummy 2003	-	-	-	-	-	-0.01 (0.03)	-
Dummy 2008	-	-	-	-	-	-	0.05*** (0.02)
<i>Observations</i>	19	19	19	19	19	19	19
<i>R-squared</i>	0.87	0.88	0.89	0.88	0.87	0.88	0.89

* significant at 1% **significant at 5% ***significant at 10%, Standart errors in parentheses

Table 18 Estimation Results of Pre Effects of Tax Amnesties on Shadow Economy (MIMIC Approach)

Dependent variable: Shadow	1	2	3	4	5	6	7
Constant	0.00 (0.15)	-0.02 (0.12)	0.01 (0.13)	0.03 (0.13)	0.00 (0.13)	0.04 (0.14)	0.06 (0.13)
Tax Burden	0.30* (0.05)	0.28* (0.06)	0.29* (0.06)	0.29* (0.05)	0.29* (0.06)	0.30* (0.06)	0.30* (0.06)
GDP per capita	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)
Unemployment	0.10*** (0.05)	0.10 (0.06)	0.10*** (0.06)	0.10 (0.06)	0.10*** (0.05)	0.10 (0.06)	0.10 (0.06)
Seizures	-0.00 (0.01)	-0.00 (0.01)	-0.00*** (0.01)	-0.00*** (0.01)	-0.00*** (0.01)	-0.00*** (0.01)	-0.00** (0.01)
Dummy 1992	0.00 (0.03)	-	-	-	-	-	-
Dummy 1997	-	-0.03 (0.02)	-	-	-	-	-
Dummy 1998	-	-	0.01 (0.02)	-	-	-	-
Dummy 2001	-	-	-	1.22** (0.58)	-	-	-
Dummy 2002	-	-	-	-	-0.01 (0.02)	-	-
Dummy 2003	-	-	-	-	-	0.02 (0.03)	-
Dummy 2008	-	-	-	-	-	-	-0.03 (0.03)
<i>Observations</i>	19	19	19	19	19	19	19
<i>R-squared</i>	0.87	0.87	0.88	0.87	0.88	0.87	0.87

* significant at 1% **significant at 5% ***significant at 10%, Standart errors in parentheses

Table 19 Estimation Results of Post Effects of Tax Amnesties on Shadow Economy (MIMIC Approach)

Dependent variable: Shadow	1	2	3	4	5	6	7
Constant	0.00 (0.13)	0.06 (0.12)	0.00 (0.12)	0.04 (0.14)	-0.01 (0.13)	0.01 (0.13)	-0.06 (0.14)
Tax Burden	0.05* (0.01)	0.05* (0.01)	0.05* (0.01)	0.05* (0.01)	0.05* (0.01)	0.05* (0.01)	0.04* (0.01)
GDP per capita	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)
Unemployment	0.01*** (0.01)	0.01** (0.00)	0.01*** (0.01)	0.01 (0.01)	0.01*** (0.01)	0.01*** (0.01)	0.01** (0.01)
Seizures	-0.00*** (0.01)	-0.00** (0.01)	-0.00*** (0.01)	-0.00*** (0.01)	-0.00*** (0.01)	-0.00*** (0.01)	-0.00 (0.01)
Dummy 1992	0.01 (0.02)	-	-	-	-	-	-
Dummy 1997	-	0.04 (0.02)	-	-	-	-	-
Dummy 1998	-	-	0.02 (0.02)	-	-	-	-
Dummy 2001	-	-	-	0.02 (0.03)	-	-	-
Dummy 2002	-	-	-	-	-0.01 (0.03)	-	-
Dummy 2003	-	-	-	-	-	0.01 (0.02)	-
Dummy 2008	-	-	-	-	-	-	0.32** (0.12)
<i>Observations</i>	19	19	19	19	19	19	19
<i>R-squared</i>	0.87	0.88	0.88	0.87	0.87	0.88	0.87

* significant at 1% **significant at 5% ***significant at 10%, Standart errors in parentheses

Residuals of the second model are also proved to be stationary by ADF with 0.01 probabilities. So, there is long run causality between *GDP per capita*, *seizures*, *unemployment*, *tax burden* and *shadow variables* and the model can be accepted unless it fails good model criteria. Residuals display normal distribution that is proven by 0,80 Jarque Bera probabilities. Serial Correlation LM test yields 0,07 probability, not rejecting the null of no serial correlation. BPG heteroscedaticity test also results in 0,47 probability, not rejecting the homoscedasticity. Moreover, Cusum stability test indicates no problem in stability of the dependent variable. Finally, explanatory variables explain 88 % of shadow variable as deducted from 0,88 R² value. Thus, the model can be accepted for further investigation of the effect of amnesties on shadow economy.

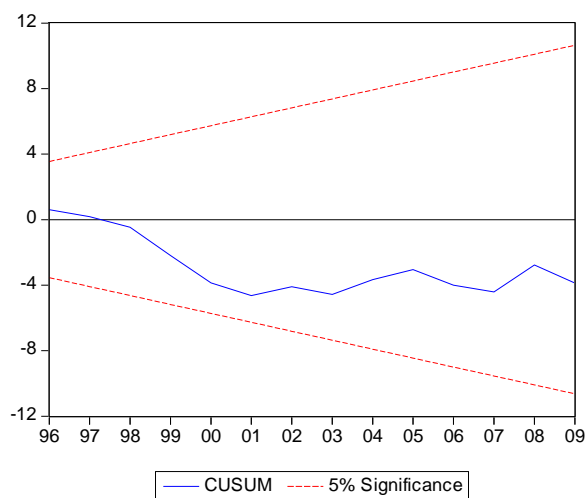


Figure 9 Cusum Test on Shadow Economy (MIMIC Approach)

In this model of shadow economy using data from MIMIC approach, the effects of *GDP per capita*, *tax burden*, *unemployment* and *seizure* are controlled for. Seizure turned out

to be significant in this model while it was insignificant in the previous one. This situation is not very extraordinary since in literature it is told that the effects of deterrence measures on shadow economy are ambiguous. The variables have expected signs like previous model and seizure variable has negative sign which means increase in audits has a decreasing effect on share of shadow economy. According to estimations of the model, one point increase in tax burden and unemployment leads to 0,29 and 0,10 point increase in ratio of shadow economy. On the other hand, 10.000 TL increase in GDP per capita decreases share of shadow economy by 0,023 points which is a smaller effect in comparison with previous model and also thinking GDP per capita in Turkey is about 20.000 TL as of 2012, the effect of GDP per capita is very small in this model. In case of seizure, one billion TL increase in seizure results in 0,02 point decrease in ratio of shadow economy but this is an average value and it does not mean fifty billion increase in seizure leads to one point decrease in shadow economy ratio because when audits and seizure operation increase, their effectiveness may diminishes so it may result in less than one point decrease in relative size of shadow economy.

Existence of cointegration allows proceeding with ECM model to see short run and long run causalities more clearly. ECM also plays a confirmative role to what other models suggest. Estimation results are provided in table 20 below.

Table 20 Estimation Results of Tax Amnesties on Shadow Economy with ECM (Currency Demand Approach)

Dependent variable: Shadow	Pre-amnesty	Amnesty	Post-amnesty
Dummy 1990	N.A	-3.35 (2.48)	-0.86 (2.25)
Dummy 1992	-0.86 (2.25)	-0.39 (2.23)	-0.30 (2.15)
Dummy 1997	0.52 (3.12)	-1.42 (2.57)	2.10 (2.43)
Dummy 1998	-1.42 (2.57)	2.10 (2.43)	-0.06 (2.44)
Dummy 2001	5.83 (1.84)	-2.63 (2.66)	-7.95 (2.25)
Dummy 2002	-2.63 (2.66)	-7.95 (2.25)	0.51 (4.15)
Dummy 2003	-7.95 (2.25)	0.51 (4.15)	-0.74 (3.31)
Dummy 2008	-0.79 (2.63)	-1.13 (3.02)	-0.14 (3.43)
<i>Observations</i>			

-standard errors in parenthesis. *significant at 1%, **significant at 5%, ***significant at 10%,
- N.A: not applicable

As for amnesty analysis, estimation results of first specification using data coming from currency method indicates amnesties mostly did not affect shadow economy significantly there are exceptions. According to results, there is a significant increase, 2,68 points, in share of shadow economy before 2001 amnesty but this amount is actually shows the long run impact. To see the short run impacts, ECM was developed and the model confirms the results. ECM says share of shadow economy increased about 5,7 points in the short run. The question is why such a change happened in shadow economy? Probably it is not due to anticipation of the amnesty but it is due to worsening economic conditions and especially banking system. On the other hand, second specification finds the same result but indicates 1,22 increase in share of shadow economy. The effect of 2001 amnesty is found insignificant at amnesty year in both specifications and ECM also confirms the result. 2001 amnesty has no significant impact on shadow economy ratio but after 2001, there is significant decrease in shadow economy ratio. Although post effect of 2001 amnesty and 2002 amnesty coincides and this makes analysis more difficult, since 2001 amnesty is introduced to raise short run

revenue in economic crisis and not part of a tax reform, it can be said that decrease in shadow economy stems from 2002 amnesty. The logic behind it works like that after 2001 crisis, honest tax payers who could not pay their tax liabilities due to hard economic conditions wanted to abide tax rules and not to pay penalties and they had this opportunity with 2002 amnesty. Thus, 2002 amnesty resulted in serious decline in relative share of shadow economy. According to the estimation results, first specification implies that the 2002 amnesty decreased shadow economy ratio by 2,78 points, second specification says 2002 amnesty decreased shadow economy by 1,41 points. ECM also confirms the result and it estimates the amnesty program led to decrease shadow economy ratio by almost 8 points.

The models give important results for 2008 amnesty too. Both models indicate 2008 amnesty has no pre effects on relative share of shadow economy due to anticipation effects. First specification and second specification indicate that shadow economy ratio increases by 0,13 and 0,05 points due to amnesty program at 2008 respectively. This is probably due to worsening economic conditions and coming global financial crisis. Otherwise, even if the amnesty program has no effect, it is expected no change in shadow economy ratio due to amnesty. It seems 2008 amnesty has significant post amnesty effects. According to results of first specification, 0,87 point increase happened in shadow economy ratio and also, second specification says 0,32 point increase in the ratio but ECM gives insignificant change although coefficient is positive. After the amnesty program shadow economy ratio keeps rising. The reason of this increase may be the financial crisis or decrease in compliance due to recurrent amnesty programs therefore the true reason is ambiguous.

As the empirical results suggest, many amnesties have been applied in Turkey but very few have affected the shadow economy. Also there is a serious suspicion about the source of effects because amnesty programs coincide with economic crisis and this is not random. On the other hand, the frequency of programs is so high that reliability of results decline. The main reasons to ineffectiveness of amnesty policies are that they have not been part of a comprehensive tax reform including structural changes in tax rules, audit mechanism. The aim of the amnesties was always argued to be gain short

run revenue and recurrence destroyed the belief in government. That is why amnesty policy in Turkey is already expected to be ineffective.

4.4 Evaluation of the Results

Econometric modelling of macro variables is often difficult to handle since they may require specific data transformations. Normality and stationarity tests are conducted to check for any necessity for transformations; thereby, chances of committing type 1 and type 2 error are tried to be minimized. Specified models are imposed to tests so as to continue with further investigation. Although the models overcame tests, there may be biases as results of omitting important variables or including unimportant variables in dataset. This kind of error may be presented in shadow economy estimation since institutional quality and tax morale effects are excluded from the very beginning due to limited data about these variables. However, all other variables are constructed and selected with care, in line with what former studies in the literature suggest. In addition, shadow estimation is implemented with two separate models and controlled for robustness. The two specifications yield parallel results, which is a good indication for the reliability of estimations.

Results for tax revenue imply that only short run increase is evident in 1988 amnesty after the amnesty period. Findings reside along with expectations; that is, none of Turkish amnesties are expected to be a successful fiscal policy implementation owing to the reasons explained in chapter 2. Implications about shadow economy are not astonishing as well. Not influencing the size of shadow economy when they are present, 2008 amnesties appeared to increase the size of shadow economy after they are adopted. 2002 amnesty is turned out to decrease the shadow economy as well, which fails for a clear explanation due to mixed effects of previous and following amnesties.

CHAPTER 5

CONCLUSION

Tax Amnesties are widespread practices that are applied mostly for revenue increases as well as shadow economy size reductions. Amnesty implementation itself, however, is proved to be ineffective unless some other success parameters are optimally designed by authorities. These parameters include tax awareness and compliance, detection probability, penalty rates, recurrence and other enforcements. In Turkey, none of these parameters are used efficiently, leading long term detriments to the economy significantly. Influences of amnesties on tax compliance is expected to offset potentially positive influences of amnesties on revenue and shadow economy effects; even for amnesties that include terms only for unreported incomes or penalty cancellations.

Turkish government is deprived of the ability of successful amnesty implementation since 1980. Mostly with political reasons, amnesties are applied frequently which, in turn, led to anticipation and decline in compliance of honest taxpayers. Besides, no lack of regulatory control mechanism and enforcements scales up the failure probability.

This paper offers an empirical approach in investigating the effect of Turkish amnesties, on the tax revenues and the shadow economy for the first time. Empirical results suggest that tax amnesties are proved to be ineffective both in terms of revenue and shadow economy size in Turkey. Only 1989 amnesty yields statistically significant results in increasing total tax revenues. As for shadow economy, all of the amnesties being insignificant except 2002 and 2008 amnesties, effects and post effects of 2008 amnesty indicate that shadow economy size increase. On the other hand, it has been found that 2002 amnesty has reduced shadow economy ratio unexpectedly.

The findings in this thesis suggest that the Turkish government should be cautious in using the tax amnesties to increase the tax revenues and to decrease the size of the shadow economy. We do not find a significant relation between the tax revenues and tax amnesties in Turkey. It is also important to note that the tax amnesties supported

by other future precautions on tax evasion like increase in the penalty rate seem to work better in terms of decreasing the size of the hidden economy.

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APPENDIX A

TURKISH SUMMARY

Türkçe Özet

Bu tezde, Türkiye’de 1985 yılı sonrası vergi affı uygulamalarının vergi gelirleri ve kayıtdışı ekonomi üzerine etkileri, ‘En Küçük Kareler’ ve ‘Hata Düzeltme’ modelleri kullanarak incelenmektedir.

1. Giriş

Vergilerden elde edilen gelirler, devletin ana finans kaynağını oluşturmakla birlikte, devletin gelişmekte olan veya gelişmiş ülke olmasına bağlı olarak taşıdığı önem değişebilmektedir. Türkiye gibi gelişmekte olan ülkelerin vergi gelirlerine vermesi gereken önem daha fazladır; çünkü, bu tarz ülkeler gelişmiş ülkelere göre çok daha fazla yatırım harcamasına ihtiyaç duyar. Örneğin, 2011 yılında, vergi gelirlerinin Gayri Safi Milli Hasıla’ya oranı Amerika Birleşik Devletleri’nde 10.1 % iken, Türkiye’de bu oran 20.1% olarak ortaya çıkmaktadır (Dünya Bankası, 2012).

Kayıt dışı ekonomi, ülkelerin refah düzeyini etkileyen bir diğer etken olup, ülkelerin en büyük ortak problemlerindedir çünkü vergi gelirlerini de düşürmektedir. Kayıt dışı ekonominin Gayri Safi Milli Hasıla’ya oranı, gelişmekte olan ülkelere gelişmiş ülkelere kıyasla daha fazladır. Türkiye’de, bu oran 26.5 % iken, Avrupa ülkelerinin ortalaması 18.4 %’dür (Schneider, 2013).

Vergi afları, bu iki problemin ortak çözümü olarak değerlendirilebilmektedir. Kayıt dışı ekonominin küçülmesinde ve vergi gelirlerinin artışında, vergi aflarının etkili olacağı düşüncesi, özellikle gelişmekte olan Arjantin, Türkiye ve Brezilya gibi ülkelerde daha

yaygın olmakla birlikte; Belçika, Avustralya, Finlandiya, Fransa, İtalya, İsviçre ve Amerika gibi gelişmiş ülkelerde de sıklıkla görülmektedir.

Bu tezin ana amacı, Türkiye'deki af uygulamalarının vergi gelirleri ve kayıt dışı ekonomi üzerine etkilerini ekonometrik olarak incelemektir. Vergi aflarının, Türkiye'deki vergi gelirlerini artırdığı ve kayıt dışı ekonomiyi azalttığı savunulsa dahi, ekonomi yazını, gelir artışının sadece kısa vadeli olduğu ve uzun vadede negatife dönüştüğünü vurgulamaktadır. Türkiye'de de, vergi afları neredeyse gelenek haline gelmiş ve 1960'dan itibaren 35'ten fazla uygulama yürürlüğe girmiştir. Bu uygulamaların etkisi, ilk defa ekonometrik olarak araştırılacaktır.

Türkiye'de vergi afları ile ilgili yürütülen teorik çalışmalar mevcuttur. Savaşan (2006), afların vergi gelirlerinin artışında, özellikle 2003 yılı için etkili olduğunu savunmaktadır. Saraçoğlu ve Çaşkurlu (2011); ve, İpek, Öksüz ve Özkaya (2012) ise, uzun vadede vergi uyumunu azalttığı için afların doğru bir yöntem olmadığını vurgulamaktadır. Bu tezin Türk vergi affı literatürüne katkısı, zaman serisi verileri kullanarak ekonometrik analiz yapılmasıdır. En küçük kareler ve hata düzeltme modelleri kullanılmıştır. İncelemeler sonucunda, sadece 1988 yılı affının vergi gelirlerinde kısa vadede olumlu etkisi gözlenmiştir. Kayıtdışı ekonomi için ise, sadece 2002 yılı affının etkili olduğu gözlenmiştir; fakat, bu etki çok net değildir çünkü diğer ardışık afların da etkisi olduğu düşünülmektedir.

2. Yazın Taraması

Vergi afları, vatandaşlara gönüllü katılım sağlayan ve önceden ödenmemiş borçların cezalarını azaltan veya iptal eden, geçici veya kalıcı kanun değişiklikleridir. Genellikle, geçici olmakla birlikte, sonrasında gönüllü olarak katılmayan vatandaşlar daha sert cezalara maruz kalırlar. Vergi afları, kendine özgü yarar ve zararları barındırır. Kısa vadede de olsa, vergi gelirlerinde artış görülmesi olasıdır. Ayrıca, dürüst ama bir sebepten borcunu ödeyememiş mükellefler için sisteme dönüş biletidir. Diğer yandan, olumsuz yanları da göz ardı edilmemelidir. İlk olarak, vergi kaçırma olduğunun itiraf

edilmesi anlamına gelmektedir ve dürüst mükelleflerin uyumunda azalmaya yol açabilir. Bu azalma sonucunda da, kısa vadede gelir elde edilse dahi, uzun vadede gelir düşüşü yaşanmaktadır. Yine de, afların başarı şansı; etkili denetim, yoğunlaştırılmış cezalar, etkili uygulamalar, affın kapsamı, vergi bilincindeki artış ve tekrar sayısı parametrelerinin doğru kullanımı ile artırılabilir.

Af sonrası denetimin ve ceza oranlarının artırılması, gönüllü katılım için bir nevi zorunluluk oluşturmakta ve katılım gösterilmemesi durumunda yakalanma riskini artırmakla birlikte, yakalanma maliyetini de yükseltmektedir. Dolayısıyla, etkili denetim ve ceza uygulamaları afların amacına ulaşmasında etkin rol oynar. Fakat, yakalanma maliyeti hala vergi kaçırma maliyetinden düşük ise, sert cezalar da caydırıcı niteliği taşımaktan yoksundur.

Diğer uygulamalar ise, vergi yükü azaltımı veya bazı vergi yükümlülüklerinden muafiyet olabilmektedir. Ayrıca, bu tip uygulamalar kendi başına affı da gerektirebilir. Sonuç olarak, vergi afları ve bu tip uygulamalar arasında karşılıklı bir ilişki vardır. Uygulamaların etkili olabilmesi için, af uygulaması öncesinde iyi bir reklam planlaması yapılmalı ve halkın bu uygulamalardan haberdar edilmesi gereklidir. Örneğin, mükelleflere af için oy hakkı verilse, af sonrası uyum artışı için etkili olabilmektedir (Torgler and Schalltegger, 2005).

Literatür kısıtlı olsa dahi, affın içeriği ne kadar kapsamlı olursa, o kadar çok mükellefe ulaşılacağından dolayı, affın içeriği olabildiğince kapsamlı olmalıdır. Bu parametre, özellikle kısa vadeli gelir artışı amaçlanıyorsa önem kazanmaktadır.

Vergi bilinci, karar verici mekanizmayı etkileyen bir diğer önemli faktördür. Kısaca, vatandaşların neden vergi ödemeleri gerekliliği konusundaki algıları olarak tanımlanabilir. Kumluca'ya (2003) göre, vergi ödeme çabası, vergi bilinciyle paralel olarak artış gösterir. Bunun yanısıra, vergi bilinci, vergi uyumu ve vergi ahlakı ile de yakından ilişkilidir. Vergi uyumu, varlık ve gelirlerin zamanında bildirilmesidir. Uyumsuzluk ise, rapor etmemenin yanısıra, eksik veya çok rapor edilmeyi de içerir. Acar ve Merter'e göre (2008), vergi bilinci, vergi sisteminin etkili oluşunu etkileyen en önemli faktörler arasında ilk sıralarda gelmektedir. İpek, Öksüz ve Özkaya (2012) ise, bu düşünceyi desteklemekte ve vergi bilincini artırıcı çalışmaların, vergiye uyumu da önemli

ölçüde artırdığını savunmuştur. Bu iddaları destekleyen Alstadseter ve Jacob (2013), yürüttükleri ampirik çalışmada, vergi bilincindeki düşüşün yanlış rapor etme olasılığını artırdığını bulmuştur. Vergi ahlakı ise, davranıştan ziyade bir yaklaşım içerir ve vergi bilinci sonucu ortaya çıkar. Yani, vergi ödemeye karşı vicdani sorumluluk olarak da nitelendirilebilir. Şöyle ki, vergi bilincinin artması, sorumluluk duygusu veya ödenmemiş borçlar yüzünden hissedilen suçluluk duygusunun olasılığını artırmaktadır. Aynı zamanda, vergi bilincindeki artış, düşük vergi ahlakı nedeniyle gelirlerde artışa sebebiyet vermeyebilir. Her şey gözönüne alındığında, vergi ahlakındaki artışın, vergi gelirleri ve kayıtdışı ekonomi üzerindeki olumlu etkileri yadsınamaz bir gerçek olarak ortaya çıkmaktadır. Yani, önemli olan şey, vergi affının vergi ahlakını ve vergi bilincini artırıcı etkisidir.

Vergi ahlakı ve uyumu, adalet kavramının iyileştirilmesi ile de artırılabilir. Zira, Kargı ve Yüksel (2010), adalet kavramının, vergi yükümlülerinin davranışını etkileyen ana faktör olduğunu düşünmektedir. Eşitsizlik anlayışı, adalet algısının oluşmasındaki öncelikli etmendir. Bu sebeple, Feld ve Frey (2002), adalet algısının önemine vurgu yaparak, af kapsamında dürüst mükelleflerin suistimaline açık maddeler bulundurulmaması gerektiğini savunmaktadır. Çünkü, dürüst mükellefler, vergi aflarını kendilerine bir ceza gibi görmekle birlikte, sorumsuz yükümlülere verilen bir ödül niteliğinde değerlendirebilmektedir. Bu algı, vergi uyumunda da düşüşe neden olmaktadır (Savaşan, 2006). Diğer bir eşitsizlik anlayışı ise, gereğinden fazla yükümlü olma hissiyatından kaynaklanmaktadır (Oral ve Sayın, 2009). Yani, vergi yükünün fazla olduğu düşüncesi, vergi ödemeye karşı olan direnci artırmaktadır. Diğer bir önemli faktör ise, düşük kurumsal kalitedir. Demir, Macintyre, Schaffner and Torgler (2008), kurumsal kalitenin vergi ahlakını belirleyen ana etmenlerden olduğu görüşünü savunmaktadır. Yolsuzluğun fazla olduğu ülkelerde, vatandaşların vergi ödemeye daha isteksiz oldukları ve vergiyi sosyal bir sorumluluk olarak görmedikleri ortaya çıkmıştır. Devlet harcamalarının iyi ve gerekli kanallara yönlendirilmediği ve kamu hizmetlerinin yetersiz kaldığı düşüncesi ise, düşük kurumsal kalite anlayışını oluşturan bir diğer etkidir. Başarı garantilenmese dahi, bu faktörlerin doğru yönetimi ile vergi uyumun artırılması suretiyle affın amacına ulaşma olasılığının artırılması mümkün görünmektedir.

Son olarak, afların uygulanma sıklığı da gözardı edilmemelidir. Afların, ilk uygulandığında en etkili olduğu ve sonraki uygulamalardaki etkisinin, uygulama sıklığı ile birlikte azaldığı bilinmektedir. Acar ve Merter (2008) ve Luitel ve Sobel (2005), afların gelire olan etkilerinin, affın tekrarlanmasına bağlı olduğu görüşünü benimsemiştir. Ayrıca, tekrar sayısı arttıkça, negatif etkinin büyüklüğü de artış sergilemektedir. Bu etkinin kaynağı, psikolojik nedenlere dayanmaktadır. Şöyle ki, vergi kaçırıcı yükümlülükler afların bir defaya mahsus olduğuna inanmaz ise, ödememe davranışlarını da devam ettirme ve hatta daha aşırya kaçma eğilimi göstermektedirler. Bunlara ek olarak, affın başarısı daha önceden tahmin edilebilirliğiyle de ilgilidir. Aflara ne kadar sık başvurulursa, rutin haline gelmekte ve öngörülebilirliği de artmaktadır. Vatandaşlarda oluşan bu af beklentisi, vergi kaçırma eğilimini de tetiklemektedir. Das Gupta and Mookherje (1995), öngörülebilirliğin etkisinin, af öncesi gelirlere düşüş olarak yansıtacağını belirtmektedir. Bunun yanısıra, sürekli af beklentisi, devletin güvenilirliği ve vergi sistemi yürütmedeki başarı algısı için de önemlidir. Vatandaşların devlete olan güveninin zedelenmesi söz konusu olmaktadır. Bu sebeple, Alm'e göre (1998), vatandaşlar af uygulamasının bir kerelik olduğuna ikna edilmelidir. Luitel ve Sobel (2005), ilk af uygulamasının 4-5 % kadar kısa vadeli gelir artışına sebep olduğunu; fakat aynı zamanda 3% civarında ise uyumda azalma olduğunu ve uzun vadede kümülatif olarak negatif etki ettiğini göstermiştir. Bu rakamlar, sıklık arttıkça daha karamsar bir senaryo oluşturmaktadır.

2.1.1 Türkiye'deki Vergi Afları

Türkiye'de, farklı sebeplerden dolayı uygulanan vergi afları neredeyse rutin haline gelmiştir. Bu afların içeriği değişiklik göstermektedir. 1980 sonrasında, 14 defa affa başvurulmuştur. Tablo 1'de 1960'dan itibaren uygulanan vergi afları görülmektedir.

Tablo 1 1960 Sonrası Türkiye’deki Vergi Afları

Yıl	Kanun Numarası	Kapsam	Ödeme Planı
1961	281	Cezaların, gecikmiş ödemelerin ve ödenmemiş faiz borçlarının iptali	1961 sonuna kadar
1963	218	Tüm vergi borçları ve ilgili cezalar	-
1963	252	Spor kulüplerinin tüm vergi borçları ve ilgili cezalar	-
1963	325	1960 sonrasındaki tüm devlet kurumlarının vergi borçları	-
1965	691	Vergilere ilişkin tüm cezalar ve ödenekler, belediye ve firmaların gecikmiş veya ödenmemiş borçları	-
1966	780	Vergilere ilişkin cezalar ve gecikmiş ödemeler	-
1974	1803	Vergilere ilişkin cezalar, 1974’e kadar ödenmemiş birikmiş cezalar, ödenekler ve kadastro yükümlülükler	8 aya kadar
1981	2431	Vergilere ilişkin cezalar, ödenekler ve yükümlülükler ve varlık bildirimlerinin gerçekleştirilmesi	31.08.1981’ e kadar
1983	2801	Vergilere ilişkin cezalar, ödenekler ve yükümlülükler ve varlık bildirimlerinin güncellenmesi	1984 sonuna kadar
1985	3239	Vergi cezaları ve gecikmiş ödenekler	1985 sonuna kadar
1988	3505	Vergi cezaları, zamanı geçmiş faizler ve gecikmiş yükümlülükler	1988 sonuna kadar
1988	3512	Vergi cezaları, zamanı geçmiş faizler ve yükümlülükler	30.06.1989’e kadar
1989	3571	Vergi cezaları, kurum ve firmaların ödenmemiş veya gecikmiş yükümlülükleri	24 ödeme 24 ay içinde
1990	3689	Vergi cezaları, geç ödenekler ve zamanı geçmiş faiz ödemeleri	2 ödeme 31.01.1991’e kadar
1992	3787	Cezalar, vergilere dair geç ödemeler, yükümlülükler	1992 Ekim’e kadar
1997	400	Cezaların yapılandırılması ve ertelenmesi	-
1998	4369	-	-
2001	414	Cezaların, ana vergi ödemelerinin ve harçların yeniden yapılandırılması veya ertelenmesi	-
2002	4751	Emlak vergisi ödemeleri ve cezalarının yapılandırılması	2002 Mayıs’a kadar
2003	4811	Vergiler, yükümlülükler, ve ilgili cezalar, geç ödemeler, zamanı geçmiş faizler ve geç bildirimler	2004 Ekim’e kadar
2008	5811	Kayıtdışı varlık bildirimi, 2008 öncesi rapor edilmemiş varlıklar için ödenmemiş vergi iptali	Deklarasyondan sonra 1 ay içinde
2011	6111	Vergi ödeme yapılandırılması, cezalar, geç ödemeler ve zamanı geçmiş faizler	18 eşit ödeme 36 ay içinde

Yukarıdaki tabloda da görüldüğü üzere, af Türkiye’de çok sık başvurulan bir politika aracı olmuştur. Diğer önemli bir faktör olan vergi bilinci, Türkiye’de süregelen bir problem olmuştur. Türk vatandaşları, vergi ödemelerinin sosyal bir sorumluluk olduğu bilincinde olmamakla birlikte; vergi kaçıranlara saygı ile bile bakılmaktadır (Oral ve Sayın, 2009). Bu etkilerin, vergi ahlakı üzerine de olumsuz etkisi vardır. Vergi ahlakına olan bir diğer olumsuz etki de, vergi yükünün eşit şekilde dağıtılmamış olması, bundan doğan eşitsizlik anlayışı ve devletin etkin olmayan harcamalarından kaynaklanmaktadır. Genel olarak, vatandaşların Türk vergi sistemine bakış açısı çok da pozitif görünmemektedir. Diğer etkiler de gözönüne alındığında, Türkiye’de vergi afları etkin olmaktan çok uzak görünmektedir ve beklentiler, afların vergi gelirleri ve kayıtdışı ekonomi üzerine olumlu etkisinin gözlenmeyeceği yönündedir.

2.2 Kayıtdışı Ekonomi

Kayıtdışı ekonomi, yapısı gereği kompleks olup, aralarında genel bir uzlaşma olmasa dahi ölçümü hakkında değişik yöntemler bulunmaktadır. Genel olarak kayıtdışı ekonomi, GSMY dışında kalan, kayıt altına alınmamış ama alındığı takdirde GSMY’yi artırıcı etki gösterecek aktiviteler olarak tanımlanabilmektedir. Tablo 2’de, kayıtdışı ekonominin kalemleri gösterilmektedir.

Tablo 2 Kayıtdışı Ekonomi Aktiviteleri

Aktivite Türü	Parasal Transferler	Parasal Olmayan Transferler		
İLLEGAL AKTİVİTELER	Kaçak mal ticareti, uyuşturucu ticareti ve üretimi, fuhuş, kumar, kaçakçılık, yolsuzluk, insan ticareti, silah ve uyuşturucu ticareti, dolandırıcılık	Uyuşturucu takası, çalınmış mallar, kaçakçılık vs; kişisel kullanım amaçlı uyuşturucu üretimi ve kullanımı, hırsızlık		
	Vergi Kaçakçılığı	Vergiden Kaçınma	Vergi Kaçakçılığı	Vergiden Kaçınma
LEGAL AKTİVİTELER	Deklare edilmemiş gelirler ; legal eşyalara ilişkin rapor edilmemiş işlerden gelen maaşlar, ödemeler ve varlıklar	Çalışan indirimi; yan haklar	Legal eşya ve hizmetlerin takası	Komşu yardımı, tamamen kendi başına yapılan işler

Kaynak: Schneider ve Williams 2013

2.2.1 Kayıtdışı Ekonomiye Belirleyen Etkenler

Loayza (1996), kayıtdışı ekonominin vergi yükü, işgücü piyasası limitasyonları ile kurumların gücü ve verimliliği olmak üzere üç ana belirleyicisi olduğunu söylemektedir. Ayrıca, halka açık eşyaların ulaşılabilirliği, vergi ahlakı, işgücü arzı kararları gibi diğer faktörler de Kannianen (2004) tarafından belirtilmiştir. Yani, özet olarak, vergi düzeyleri, vergi ahlakı, düzenlemelerin yoğunluğu, kurumsal nitelik ve kamu servisleri öncelikli kayıtdışı ekonomi belirleyicileri olarak nitelendirilebilmektedir.

Vergi ve sosyal güvenlik primleri işgücü piyasası kararlarını doğrudan etkilediği için saklı ekonomide önemli yere sahiptir. Çalışanların harcamaları ve vergi sonrası ellerinde kalan miktar arasındaki fark arttıkça, saklı ekonomide çalışmaya karşı motivasyonları da artmaktadır. Yine de, Savaşan ve Schneider'in (2007) argümanlarına göre, vergi yükünün hafifletilmesi yeterli olmamaktadır. Caydırma önlemleri gibi diğer etkenler de dikkate

alınmalıdır. Caydırma niteliği taşıyan etmenlerin etkileri pratikte gözlenmese dahi, Blackwell (2009) ampirik çalışmasında güçlü pozitif etkiler bulmuştur. Feld (2007) ve Pederson (2003) da, güçlendirilmiş cezaların ve yakalanma riskinin artırılmasının, saklı ekonomide gerileme konusunda çok olumlu etkilerinin olduğunu belirtmişlerdir.

Düzenlemelerin yoğunluğu da önemlidir; çünkü, vergi sistemindeki karmaşıklık ve karışıklık arttıkça, kayıt dışı ekonomiye olan eğilim de artış göstermektedir. Johnson (1998) ve Friedman (2000) bu görüşü desteklemektedir.

Son olarak, kurumsal nitelik ve kamu hizmetlerinin kalitesinden bahsedilmelidir. Halkın devletle ilgili olumsuz düşünceleri ve yüksek yolsuzluk oranı, kayıtdışı ekonomi üzerinde negatif etkiye sahiptir. Johnson'a göre (1998), daha düşük vergi oranları, daha az yolsuzluk ve daha basit düzenlemelere sahip ülkelerde görülen kayıtdışı ekonomi düzeyleri daha düşük olmakla birlikte, vergi gelirleri de daha yüksektir. Vergi ahlakının etkileri konusunda ise; Schneider ve Torgler (2009) ile Feld ve Larsen (2009), devlet harcamalarının adil dağılımının vergi ahlakını olumlu yönde etkilediğini ve dolayısıyla saklı ekonomiyi körelttiğini savunmuştur.

2.2.2 Kayıt Dışı Ekonomi Ölçme Yöntemleri

Kayıt dışı ekonominin hesaplanması karmaşık bir hesaplama olmakla birlikte, farklı sonuçlar veren farklı yöntemler geliştirilmiştir. Bu yöntemler; doğrudan yaklaşım, dolaylı yaklaşım ve MIMIC (Çoklu Nedenler ve Çoklu Göstergeler) yaklaşımı olmak üzere 3 ana kategoriye ayrılmaktadır.

Doğrudan yaklaşımlar daha çok anketlere, mülakatlara ve kişisel denetlemelere dayanmaktadır. Basit olmanın yanısıra, dezavantajları da bulunmaktadır. En önemli dezavantajı ise, güvenilirlik bakımından cevaplayıcılara bağlı olması ve subjektif, doğru olmayan veya eksik bilgilerle ölçümlenmesidir. Ayrıca, anketin yapısına ve soruların kapsamına göre sonuçlar da büyük ölçüde değişkenlik gösterebilmektedir. İnsanlar

genelde vergi uyumları düşük olsa dahi bunu itiraf etmek istemezler, bu nedenle de anketlerdeki sorulara gerçeğe uygun şekilde cevap vermeyebilirler. Bu sebepten ötürü bu yöntemle hesaplanan kayıt dışı ekonomi büyüklük olarak diğer yöntemlere kıyasla daha düşük çıkmaktadır. Bu problemin önüne geçmek için anket veya görüşme sorularının büyük bir itina seçilmesi gerekmektedir.

Dolaylı yaklaşımlar ise makroekonomik değişkenlerin birbirleri ile ilişkilerine dayanır. Bu değişkenler, GSMH, işgücü, işlemler ve nakit talep olarak 4 alt kategoride toplanmaktadır. GSMH yöntemi, ulusal harcamalar ve gelirler arasındaki farkı baz alır. Saklı ekonomide elde edilen gelir ülke sınırları içinde harcanmazsa, bu yöntemin güvenilirliği azalmaktadır. İşgücü yaklaşımı, toplam işgücünü sabit tutarak, iş gücüne katılımdaki düşüşü kayıtdışı ekonomiye katılım olarak hesaplamaktadır. Katılım oranındaki diğer etkileri göz ardı etmesi, bu yöntemin teşkil ettiği bir problemdir. İşlemler yaklaşımı, GSMH ile işlemler arasında sabit bir ilişki varsayımına dayanmaktadır. Bu yöntem için gerekli veriyi elde etmek ve kayıt altına almak çok zordur. Son olarak, para talebi yaklaşımı kayıt dışı ekonomideki artışın para talebindeki artışa sebebiyet verdiğini ve saklı ekonominin esas sebebinin vergi yükü olduğunu varsayar. Bu varsayım, para talebi yönteminin asıl dezavantajıdır; çünkü, kayıt dışı ekonominin vergi yükü dışında da belirleyicileri vardır. Bu yaklaşıma dair diğer bir dezavantaj ise, legal para akış hızının illegal para akış hızına eşit olduğunun kabul edilmesidir.

MIMIC yaklaşımda ise, birbirinden farklı saklı ekonomi belirleyicileri gözönünde bulundurulmaktadır. Bütün potansiyel nedenler ve gözlemlenemeyen değişkenlerin etkileri de hesaba dahil edilmektedir. Bu nedenle bu yöntemle yapılan hesaplama diğer yöntemlere göre daha gerçekçi olarak kabul edilir ve uygulamalara bakıldığında daha yüksek tahmin sonuçları vermektedir. Bu etkilerin ve değişkenlerin çok fazla ve kompleks olması ise MIMIC yaklaşımın başlıca problemidir.

3. VERİLER

1985 ile 2009 yılları arasında yıllık veriler kullanılmıştır. Vergi gelirlerinin modellenmesinde, reel GSMH, enflasyon ve denetim matrahı değişkenleri kullanılmıştır. Kayıt dışı ekonomi tahmininde, iki farklı yöntemden (MIMIC ve Para Talebi yöntemleri) elde edilen veriler kullanılmış ve vergi yükü ve GSMH ortak olmak üzere, denetim matrahı değişkeni de kullanılmıştır.

4. AMPİRİK ANALİZ

Afların vergi gelirleri ve kayıt dışı ekonomi üzerine etkileri, *Hata Düzeltme* ve *En Küçük Kareler* modelleri ile araştırılmış, af öncesi ve sonrası etkileri ile birlikte incelenmiştir. 1985 ile 2009 yılları arası verileri kullanılmış olup, gözlem sayısı azlığı nedeniyle farklı spesifikasyonlar denenmiş ve elde edilen en uygun modelle analize devam edilmiştir.

Tüm değişkenler normalite ve durağanlık testleri ile test edilmiş, trend analizleri gerçekleştirilmiştir. Affın etkileri ise, uygun model belirlendikten sonra, gölge değişkenlerinin modele dahil edilerek incelenmiştir.

Değişkenlere normalite testleri uygulanmış ve trend analizi yürütülmüştür. Normalite önemli bir etken olup, resgresyon sonuçlarını önemli ölçüde etkileyebilmektedir. Aynı zamanda, makroekonomik zaman serilerinde normal dağılım gösteren seriler nadir görüldüğü için, hata payının bu bağlamda en aza indirgenmesi için gereklidir. Buna ilave olarak, değişkenler arasında daha doğrusal bir ilişki elde edilmesini sağlamaktadır. Trend analizi ise, sezonsallık gibi belirsizliklerin etkisinden arınmayı sağlamaktadır. Trend ve normalite testleri, Jarque Bera değerlerinin trendli ve trendsiz regresyonlarıyla karşılaştırılması şeklinde gerçekleştirilmiştir.

Durağanlık testleri ise, ADF (*Augmented Dickey Fuller*) ve KPSS (*Kwiatkowski–Phillips–Schmidt–Shin*) ile yürütülmüştür. Serilerin durağan olması en az normal olmaları kadar

önem taşımaktadır. Şöyle ki; durağan olmayan serilerin regresyonunda, istatistiksel olarak önemli olmayacak olan değişkenler bile önemli sonuçlar verebilir.

4.1 Afların Vergi Gelirleri Üzerine Etkisi

En Küçük Kareler yöntemi ile elde edilen modelde, sadece 1988 yılı affı 5% önem seviyesinde önemli çıkmış fakat vergi gelirlerini artırıcı etkiden uzak kalmıştır. Uzun vadede gelirler azalsa dahi, en azından affın yürürlüğe girdiği sene gelir azalması yaşanmış olup; bu sonuç beklentilerin tersi yönündedir. Bu durum, 1989 yılı affının önceki yıla olan negatif etkisi ile açıklanabilir. 1989 yılındaki vergi affı, halk tarafından öngörülebilir olduğu için; ve aynı zamanda bu affın önceki etkisi 1988 affının etkisinden daha büyük olduğu için, 1988 yılı vergi gelirinde düşüş yaşanmış olabilmektedir. Bir diğer neden ise, en küçük kareler yönteminin kümülatif etkiyi gözönünde bulundurmasından kaynaklı olabilmektedir. 1989 yılı affı ise, 5% önem seviyesinde bile önemli çıkmış ve vergi gelirlerini artırmıştır. 1989 affı dışında, hiçbir vergi affının vergi geliri üzerine olumlu etkisi gözlemlenmemiştir. ECM modeli de, 1988 yılının işareti dışında benzer sonuçlar vermektedir. Sadece, 1989 yılında vergi gelirlerinde af nedeniyle artış görüldüğü sonucuna varılmıştır.

4.2 Afların Kayıtdışı Ekonomi Üzerine Etkisi

Daha önce bahsedildiği üzere, kayıtdışı ekonomi için iki farklı model kullanılmış ve karşılaştırma yapılmıştır. Nakit talep yönteminden elde edilen verilere göre, 2001 affının önceki yılında kayıtdışı ekonomide kayda değer artış görülmüştür; fakat, bu etki 2002 affına bağlanabilse dahi, MIMIC yöntemiyle elde edilen verilere göre 2001 yılı sonrasında saklı ekonominin azaldığı görülmüştür. ECM modeli de aynı sonuçları vermektedir. 2001 ve 2002 aflarının etkileri birbirleri ile çıktığı için, analiz daha da zorlaşmaktadır; fakat 2001 yılı öncesindeki artışı ekonomik krize bağlamak mümkün

görülmektedir. 2008 affı ise, her iki model için de kayıtdışı ekonomiyi artırıcı etki göstermiştir. Aynı şekilde, 2008 yılında yaşanan küresel krizin bu bağlamda etkisi olduğu düşünülmektedir.

Sonuçlar, kurumsal kalite, kamu mallarına ve hizmetlerine erişim imkanı ve düzenleme yoğunluğu gibi bazı önemli değişkenlerin dahil edilememesinden dolayı hata payına açık olsa dahi, var olan değişkenlerin ve akların kayıtdışı ekonomi üzerine etkilerini görmek açısından önem arz etmektedir.

APPENDIX B

TEZ FOTOKOPİSİ İZİN FORMU

ENSTİTÜ

Fen Bilimleri Enstitüsü	<input type="checkbox"/>
Sosyal Bilimler Enstitüsü	<input checked="" type="checkbox"/>
Uygulamalı Matematik Enstitüsü	<input type="checkbox"/>
Enformatik Enstitüsü	<input type="checkbox"/>
Deniz Bilimleri Enstitüsü	<input type="checkbox"/>

YAZARIN

Soyadı : KARA
Adı : Hüseyin
Bölümü : İktisat

TEZİN ADI (İngilizce) : The Effects of Tax Amnesties on Tax Revenue and Shadow Economy in Turkey

TEZİN TÜRÜ : Yüksek Lisans Doktora

1. Tezimin tamamından kaynak gösterilmek şartıyla fotokopi alınabilir.
2. Tezimin içindekiler sayfası, özet, indeks sayfalarından ve/veya bir bölümünden kaynak gösterilmek şartıyla fotokopi alınabilir.
3. Tezimden bir bir (1) yıl süreyle fotokopi alınamaz.

TEZİN KÜTÜPHANEYE TESLİM TARİHİ: