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Size and Progression of the Shadow Economies of Turkey and Other OECD Countries from 2003 to 2013: Some New Facts

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Abstract

In this paper, the main focus is on the definition, measurement methods, and causal factors of the shadow economy in OECD countries. The greatest influence on the shadow economy is tax policies and state regulation. Furthermore, an appreciation of the overall burden of the state (taxes and regulations) and the general situation in the labor market, including levels of self-employment and unemployment, is crucial for an understanding of the dynamics of the shadow economy.

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Keywords: Shadow economy, undeclared work, tax morale, tax pressure, state regulation.

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1. Introduction

Fighting tax evasion and the shadow economy has been an important policy goal in OECD countries for decades. In order to realize this goal, governments first need to know much more about the phenomenon of the shadow economy: its size and extent, how it developed, and why people are motivated to participate in it. Hence, in this paper, I am mainly concerned with presenting the definition, measurement, driving forces, and the size and progression over time of the shadow economies of Turkey and other OECD countries. Tax evasion as such is not explored in depth here so as to keep the subject of this paper tractable and preclude the addition of too many other aspects.[1] In any case, tax morale or experimental studies of tax compliance are beyond the scope of this paper.[2]

My paper is organized as follows: Section 2 presents theoretical considerations of the definition (2.1) and measurement of the shadow economy (2.2) and discusses the main factors (2.3) determining its size. In Section 3, certain empirical results of the size and progression of the shadow economies of Turkey and other OECD countries are covered. In Section 4, the driving forces of the shadow economy are outlined. Finally, in Section 5, several policy conclusions are drawn.

2. Some Theoretical Considerations of the Shadow Economy

2.1 Defining the Shadow Economy

Most authors trying to measure the shadow economy still face the difficulty of a precise definition of it.[3] According to one commonly used defini-

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1 See Andreoni, Erard, and Feinstein (1998) for the authoritative survey, Feld and Frey (2007) or Kirchler (2007) for broader interdisciplinary approaches, or the papers by Kirchler, Maciejovsky, and Schneider (2003), Kastlunger, Kirchler, Mittore, and Pitters (2009), and Kirchler, Hoelzl, and Wahl (2007).

2 The authoritative scientific work on tax morale is by Torgler (2007). See also Torgler (2002) for a survey of experimental studies.

3 My paper focuses on the size and progression of the shadow economy for uniform countries and not for specific regions. Recently, first studies have been undertaken to measure the size of the shadow economy as well as the "gray" or "shadow" labor force for urban regions or states (e.g., California). See, e.g., Marcelli, Pastor, and Joassart (1999), Marcelli (2004), Chen (2004), Williams and Windebank (1998, 2001a, b), Flaming, Hayolamak, and Jossart (2005), Alderslade, Talmage, and Freeman (2006), and Brück, Haisten-DeNew, and Zimmermann (2006). Herwartz, Schneider, and Tafenau (2009) and Tafenau, Herwartz, and Schneider (2010) estimate the size of the shadow economy of 234 EU-NUTS regions for the year 2004 for the first time, demonstrating a considerable regional variation in its size. Lately, Buehn (2012) has estimated the size and changes over time of various German districts.

tion, it comprises all currently unregistered economic activities that contribute to the officially calculated Gross National Product.[4] Smith (1994, p. 18) defines it as "market-based production of goods and services, whether legal or illegal, that escapes detection in the official estimates of GDP." Put differently, one of the broadest definitions is: "…those economic activities and the income derived from them that circumvent or otherwise avoid government regulation, taxation, or observation."[5] As these definitions still leave room for interpretation, Table 2.1 provides a further clarification as to what could be a reasonable consensus definition of the underground (or shadow) economy.

Table 2.1 A Taxonomy of Types of Underground Economic Activities[1)]

Type of Activity	Monetary Transactions		Non-Monetary Transactions	
ILLEGAL ACTIVITIES	Trade in stolen goods; drug dealing and manufacturing; prostitution; gambling; smuggling; fraud, human-, drug-, and weapons-trafficking		Barter of drugs, stolen goods, smuggling, etc. Production of or growing drugs for own use; theft of goods for own use.	
	Tax Evasion	Tax Avoidance	Tax Evasion	Tax Avoidance
LEGAL ACTIVITIES	Unreported income from self-employment; wages, salaries, and assets from unreported work related to legal services and goods	Employee discounts, fringe benefits	Barter of legal services and goods	All do-it-yourself work and neighborly help

[1)] Structure of the table is taken from Lippert and Walker (1997, p. 5), with additional remarks.

From Table 2.1, it is obvious that a broad definition of the shadow economy includes unreported income from the production of legal goods and services, either from monetary or barter transactions–and therefore covers all productive economic activities that would generally be taxable were they reported to the state (tax) authorities.

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[4] This definition is used, e.g., by Feige (1989, 1994), Schneider (1994a, 2003, 2005, 2011) and Frey and Pommerehne (1984). Do-it-yourself activities are not included. For estimates of the shadow economy and the do-it-yourself activities for Germany, see Bühn, Karmann, and Schneider (2009) or Karmann (1986, 1990).

[5] This definition is taken from Del'Anno (2003), Del'Anno and Schneider (2004), and Feige (1989); see also Thomas (1999), Fleming, Roman, and Farrell (2000), or Feld and Larsen (2005, p. 25).

In this paper, the following more narrow definition of the shadow economy is used:[6] the shadow economy refers to all market-based legal production of goods and services that are deliberately concealed from public authorities for the following reasons:

1. to avoid payment of income, value added, or other taxes,
2. to avoid payment of social-security contributions,
3. to avoid having to meet certain legal labor-market standards, such as minimum wages, maximum working hours, safety standards, etc., and
4. to avoid complying with certain administrative obligations, such as completing statistical questionnaires or other administrative forms.

Thus, I will not deal with typically illegal underground economic activities that fit the characteristics of classic crimes, like burglary, robbery, drug dealing, etc. I also exclude the informal household economy, which consists of all household services and production.

2.2 Measuring the Shadow Economy[7]

The definition of the shadow economy plays a leading role in assessing its size. With a clear definition, a number of ambiguities and controversies can be avoided. In general, there are two types of shadow economic activities: illicit employment and household-produced goods and services, which are mostly consumed within the household. The following analysis tries to exclude illegal activities, such as drug production, robbery, and human trafficking. Likewise, household-produced goods and services, e.g., schooling and child care, are not part of this analysis. Thus, the focus is limited to productive economic activities that would normally appear in the national accounts but that remain underground due to tax or regulatory burdens.[8] Although such legal activities contribute to the country's value added, they are not captured in the national accounts because they occur in illicit ways (e.g., services provided by those without proper qualifications or a craftsman's certification). From the economic and social perspective, soft forms of illicit employment, such as moonlighting (e.g., construction work in private homes) and its contribution to aggregate value-added, can be assessed rather positively.

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[6] See also the excellent discussion of the definition of the shadow economy in Pedersen (2003, pp.13-19) and Kazemier (2005a), who use a similar one.

[7] Compare also Feld and Schneider (2010) and Schneider (2011).

[8] With this definition, the problem of having classic crimes included is avoided because neither the MIMIC procedure nor the currency-demand approach captures these activities: e.g., drug dealing is independent of increasing taxes, especially as the included causal variables are not linked (or causal) to classic criminal activities. See, e.g., Thomas (1992), Kazemir (2005a, b), and Schneider (2005).

Although the issue of the shadow economy has long been under investigation, the discussion of what is the "appropriate" methodology for assessing its scope has been contentious—to the present day.[9] There are three methods of assessment:

(1) Direct procedures at a micro level that aim to determine the size of the shadow economy at one particular point in time. An example is the survey method;

(2) Indirect procedures that make use of macro-economic indicators as a proxy for the behavior of the shadow economy over time;

(3) Statistical models that estimate the shadow economy as an "unobserved" variable.

Today in most cases, the estimation of the shadow economy is based on a combination of the MIMIC (Multiple Indicators and Multiple Courses) procedure and the currency-demand method; or on just the currency-demand method.[10] The MIMIC procedure assumes that the shadow economy remains an unobserved phenomenon (latent variable) that can be visualized by means of quantitatively measurable causes of illicit employment, e.g., tax burden and regulation intensity, and indicators reflecting illicit activities, e.g., currency demand, official GDP, and official working time. A disadvantage of the MIMIC procedure is the fact that it produces only relative estimates of the size of the shadow economy. Thus, the currency-demand method[11] is resorted to in order to calibrate the relative-into-absolute estimates (e.g., in percent of GDP); this is done by working with two or three absolute values (in percent of GDP) to yield the size of the shadow economy.

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[9] For the strengths and weaknesses of the various methods, see Bhattacharyya (1999), Breusch (2005a, b), Dell'Anno, and Schneider (2009), Dixon (1999), Feige (1989), Feld and Larsen (2005), Feld and Schneider (2010), Giles (1999a, b, c), Schneider (1986, 2001, 2003, 2005, 2006, 2011), Schneider and Enste (2000a, b, 2002, 2006, 2013), Tanzi (1999), and Thomas (1992, 1999).

[10] These methods are presented in detail in Schneider (1994a, b, c, 2005, 2011), Feld and Schneider (2010), and Schneider and Enste (2000b, 2002, 2006, 2013). Furthermore, these studies discuss advantages and disadvantages of the MIMIC and the money-demand methods as well as other estimation methods for assessing the size of illicit employment; for a detailed discussion, see Feld and Larsen (2005).

[11] This indirect approach is based on the assumption that cash is used to make transactions within the shadow economy. By using this method, one econometrically estimates a currency-demand function, including independent variables like tax burden, regulation, etc. that "drive" the shadow economy. This equation is used to make simulations of the amount of money that would be necessary to generate the official GDP. This amount is then compared with the actual money demand, and the difference is treated as an indicator for the development of the shadow economy. On this basis, the calculated difference is multiplied by the velocity of money of the official economy, producing a value-added figure for the shadow economy. See footnote 9 for references that critique this method.

Another way of guessing the size of the shadow economy is through survey methods (Feld and Larsen (2005, 2008, 2009)). To minimize the number of defective respondents (i.e., those who give dishonest responses or decline to answer the more sensitive questions), structured interviews are undertaken (usually face-to-face) in which the respondents are slowly exposed to the main purpose of the survey. As with the contingent-valuation method (CVM) in environmental economics (Kopp et al., 1997), the questionnaire first aims at shaping respondents' perception of the issue at hand, then elicits reports of their activities in the shadow economy, followed by a group of the usual socio-demographic questions.

In addition to the studies by Merz and Wolff (1993), Feld and Larsen (2005, 2008, 2009), Haigner et al. (2011), and Enste and Schneider (2006) for Germany, the survey method has been applied in the Nordic countries, Great Britain (Isachsen and Strøm 1985, Pedersen 2003), and the Netherlands (van Eck and Kazemier 1988, Kazemier 2006). While the questionnaires underlying these studies are broadly comparable in design, recent attempts by the European Union to provide survey results for all EU member states have run into difficulties as far as comparability is concerned (Renooy et al. 2004, European Commission 2007); part of the problem arises from the wording of the questionnaires, which becomes more and more cumbersome in certain of the national cultures when the subject is the underground economy.

These two sets of approaches are the ones most broadly seen in the literature. Although each has its drawbacks, and although biases in estimates of the shadow economy almost certainly exist, no better data are currently available. Moreover, let me clearly state that there is no exact measure for the size of the shadow economy. Each method has its strengths and weaknesses (shown in detail in Schneider and Enste (2000b)). Every such estimate carries an error margin of +/- 15%, with the macro estimates (e.g., MIMIC, currency-demand method, the electricity approach) being upper-bound estimates and the micro (survey) estimates lower-bound.

In tax-compliance research, the most interesting data stem from actual tax audits by the US Internal Revenue Service (IRS). In the Taxpayer Compliance Measurement Program (TCMP), the degree of actual compliance of taxpayers is observed and finds its way into empirical analysis (Andreoni, Erard, and Feinstein 1998). Whereas the approach of the IRS is more encompassing, given that its target is tax evasion from all sources of income, the two methods mentioned above concentrate on labor income and the attempts to evade tax on it generate a sharper picture of the shadow economy. Even the data obtained from the TCMP is biased, however, because the actually detected cases of tax non-compliance could only be the tip of the iceberg. Even so, the

imperfect data in this area can still offer interesting insights into the size, the structure, and the determinants of the shadow economy and its labor force.

2.3 The Main Causes of the Shadow Economy

A useful starting point for a theoretical discussion of tax non-compliance is the paper by Allingham and Sandmo (1972) on income-tax evasion. While the shadow economy and tax evasion are not congruent, activities in the shadow economy in most cases imply the evasion of direct or indirect taxes. This being the case, the factors driving tax evasion will most certainly also affect the shadow economy. According to Allingham and Sandmo, tax compliance depends on its expected costs and benefits. More specifically, the benefits of tax non-compliance result from the individual marginal tax rate and the true individual income. In the case of the shadow economy, we derive the individual marginal tax rate by calculating the overall marginal tax burden from indirect and direct taxes, including social-security contributions. The individual income generated in the shadow economy is usually categorized as labor income, less often as capital income. As for the costs of non-compliance, these arise from deterrence enacted by the state. In practice, this has meant that tax non-compliance is more a function of the zealousness of a state auditing authority and the resulting corresponding likelihood of being caught, as well as the fines that would have to be paid. As individual morality also plays a role in compliance, additional downsides could come in the form of psychic costs like shame or regret, but also unforeseen additional pecuniary costs if, for instance, damage to one's reputation results.

Kanniainen, Pääkönen, and Schneider (2004) incorporate many of these insights into their model of the shadow economy in their view of labor-supply decisions. They hypothesize that tax hikes unambiguously increase the shadow economy, while the effect of the public goods financed by those taxes depends on the ability of members of the society to access them. Morality is also part of this analysis. But the moral-related costs for individual non-compliers appear to be mainly offset by state punishment, although self-esteem also figures in the dynamic at work here.

One shortcoming of these analyses is the neglected endogenicity of tax morale and good governance. In contrast, Feld and Frey (2007) argue that tax compliance is the result of a complicated interaction between tax morale and deterrence measures. While it is a given that taxpayers must know what the rules of the game are and as the state's deterrence measures serve as signals for the tax morale that a society wants to elicit (Posner 2000a, b), nonetheless such deterrence could also diminish the intrinsic motivation to pay taxes. Moreover, tax morale is not only boosted when taxpayers perceive the public

goods they receive in exchange for their tax payments to be worth it. It also grows if political decisions affecting the public are seen as fairly followed out and if the tax authorities are regarded as friendly and fair when dealing with the public. Tax morale is thus not exogenously given but is influenced by deterrence, the quality of government institutions, and the constitutional differences among countries.

Although this leaves me with a rich set of variables that might influence the size of the shadow economy, it is only the starting point. Since labor-supply decisions are involved, labor- and product-market regulations must also be accounted for. Recent theoretical approaches thus suggest following a differentiated policy to contain the shadow economy's expansion.

2.3.1 Deterrence[12]

There is surprisingly little known from empirical studies about the effects of tax non-compliance deterrence. In their survey of tax compliance, Andreoni, Erard, and Feinstein (1998) report that deterrence affects the incidence of tax evasion but that the reported effects are rather small. Blackwell (2010) finds strong deterrence effects of fines and audits in experimental tax evasion. Regarding the shadow economy, however, there is little evidence.

This is due to the unavailability of data on the legal background and the frequency of audits on an international basis. They would also be difficult to collect even for the OECD member countries. A study by Feld, Schmidt, and Schneider (2007) demonstrates this in Germany, where there was an especially knotty legal background, with differentiating fines and other punishments meted out according to the severity of the offense, the true income of the non-complier, and the geographical location of the target (directives from courts on such punishments varied from German state to German state). Moreover, the tax authorities at the state level would not reveal how intensively auditing was taking place. Therefore, the authors worked with the available data on fines and audits and conducted a time-series analysis with the estimates of the shadow economy obtained by the MIMIC approach. According to their results, deterrence does not have a consistent effect on the German shadow economy. The Granger causality tests showed the direction of causation (in the sense of precedence) was ambiguous, leaving room for either an interpretation having the shadow economy impacting deterrence activities or vice versa.

Feld and Larsen (2005, 2008, 2009) follow a different approach with their individual survey data for Germany. First replicating Pedersen (2003), who

[12] This part is taken from Feld and Schneider (2010, pp. 115-116).

reports a negative impact of the subjectively perceived risk of detection by state audits on the probability of working in the shadows for the year 2001, they then extend it by adding subjectively perceived measures of fines and other punishments. Fines and punishments turn out not to exert a negative influence on the shadow economy in any of the annual waves of surveys, nor in the pooled regressions for the 2004-07 period (about 8,000 observations overall). The subjectively perceived risk of detection has a robust and significant negative impact in individual years only for women. In the pooled sample for 2004-07, which minimizes sampling problems, the probability of detection has a significantly negative effect on the probability of working in the shadow economy also for men (keeping the one for women) and is robust across different specifications.[13]

Pedersen (2003) reports negative effects of the subjectively perceived risk of detection on the probability of conducting undeclared work in the shadows for men in Denmark in 2001 (marginally significant), for men in Norway in 1998-2002 (highly significant),[14] men and women in Sweden in 1998 (highly significant in the first and marginally significant in the second case), and no significant effect for Great Britain in 2000. Moreover, van Eck and Kazemier (1988) report a significant negative of a high perceived probability of detection on participation in the hidden labor market for the Netherlands in 1982-83. In none of these studies were perceived fines and punishments included as explanatory variables. The large-scale survey done in Germany by Feld and Larsen (2005, 2009) thus appears to be the most careful analysis of deterrence effects on undeclared work to date.

Overall, this is far from convincing evidence of the proper working of government deterrence efforts. The reasons for this failure are discussed in the tax-compliance literature by Andreoni, Erard, and Feinstein (1998), Kirchler (2007), or Feld and Frey (2007). They range from interactions between tax morale and deterrence, where the fear of punishment overwhelms self-directed tax morale, to more mundane arguments, like the misperceptions of taxpayers. Likewise, these reasons could explain the poor performance of governments in deterring participation in the shadow economy. The known information on this comes mainly from survey studies, which may mean that the insignificant findings for fines and punishments also result from shortcomings in the survey design.

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[13] An earlier study by Merz and Wolff (1993) does not analyze the impact of deterrence on undeclared work.

[14] The earlier study by Isachsen and Strøm (1985) for Norway does not properly analyze the impact of deterrence on undeclared work either.

2.3.2 Tax and social-security contribution burdens

In contrast to deterrence, almost all studies demonstrate that the tax and social-security contribution burdens are among the main causes of the existence of the shadow economy.[15] Since taxes affect labor-leisure choices and stimulate the labor supply in the shadow economy, the distortion of the overall tax burden is a major concern. The bigger the difference between the total labor cost in the official economy and after-tax earnings (from work), the greater is the incentive to reduce the tax wedge and work in the shadow economy. Since the tax wedge consists of both social-security payments and the overall tax burden, these measures are key features of the existence and the growth of the shadow economy.

2.3.3 Intensity of regulations

Greater intensity of regulations, such as labor-market regulations, trade barriers, and labor restrictions on immigrants, is another aspect of national life that reduces the freedom (of choice) for individuals engaged in the official economy. Johnson, Kaufmann, and Zoido-Lobatón (1998b) find significant empirical evidence of the influence of (labor) regulations on the shadow economy; this impact is clearly described and theoretically derived in other studies as well, e.g., in Germany (*Deregulierungskommission*/Deregulation Commission 1991).[16] Regulations lead to a substantial run-up in the labor costs in the official economy. However, since most of these costs can be shifted to employees, regulations provide another incentive to work in the shadow economy, where they can be avoided. Johnson, Kaufmann, and Shleifer (1997) report empirical evidence supporting their model, which predicts that countries with higher general regulation of their economies tend to have a higher share of the unofficial economy in total GDP. They conclude that it is the enforcement of regulation that matters to firms and individuals, not the overall extent of regulation–mostly not enforced–and drives them into the shadow economy. Friedman, Johnson, Kaufmann, and Zoido-Lobaton (2000) arrive at a similar conclusion. In their study, every available measure of regulation is markedly correlated with the share of the unofficial economy, and the estimated sign of the relationship is unambiguous: more regulation is correlated with a larger shadow economy.

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[15] See Thomas (1992), Lippert and Walker (1997), Schneider (1994a, b, c, 1997, 1998a, b, 1999, 2000, 2003, 2005, 2009), Johnson, Kaufmann, and Zoido-Lobatón (1998a, b), Tanzi (1999), Giles (1999a), Mummert and Schneider (2001), Giles and Tedds (2002), and Dell'Anno (2003).

[16] The effect of regulation on the official and unofficial (shadow) economy was more recently investigated by Loayza, Oviedo, and Servén (2005a, b). Kucera and Roncolato (2008) extensively analyze the impact of labor-market regulation on the shadow economy.

2.3.4 Public-sector services

When a shadow economy enlarges, reduced state revenues follow in its wake, after which a lowering in the quality and quantity of publicly provided goods and services makes itself felt. Ultimately, this often leads to higher tax rates for companies and individuals in the official sector. Quite often, the combination of deteriorated public goods (such as the public infrastructure) and administration gives rise to even stronger incentives to jump into the shadow economy. Johnson, Kaufmann, and Zoido-Lobatón (1998a, b) present a simple model of this relationship. According to their findings, smaller shadow economies occur in countries with higher tax revenues achieved by having lower tax rates, fewer laws and regulations, and less bribery demanded of enterprises. Countries with a better rule of law, which is financed by tax revenues, also have smaller shadow economies. Transition countries tend to have higher levels of regulation in parallel with much higher levels of bribery, steeper effective taxes on official activities, and a large discretionary framework of regulations; consequently, there is a bigger shadow economy. Their overall conclusion is that "wealthier countries of the OECD, as well as some in Eastern Europe, find themselves in the 'good equilibrium' of a relatively low tax and regulatory burden, sizable revenue mobilization, a good rule of law and corruption control, and a [relatively] small unofficial economy. By contrast, a number of countries in Latin America and the former Soviet Union exhibit characteristics consistent with a 'bad equilibrium': tax and regulatory discretion and the burden on the business sector is high, the rule of law is weak, and there is a high incidence of bribery and a relatively high share of activities in the unofficial economy." (Johnson, Kaufmann, and Zoido-Lobatón 1998a, p. 1).

2.3.5 Other public institutions

Recently, various authors[17] have put forward the notion of the quality of public institutions being another key factor in the development of the informal sector. They argue that the efficient and discretionary application of tax systems and regulations by government may play a crucial role in the decision to conduct undeclared work, even more decisive than the actual burden of taxes and regulations. In particular, corruption in the bureaucracy and among other government officials seems to be associated with more unofficial activity, while a good rule of law, which secures property rights and enforces contracts, increases the benefits of being formal.

[17] See, e.g., Johnson et al. (1998a, b), Friedman et al. (2000), Dreher and Schneider (2009), Dreher, Kotsogiannis, and Macorriston (2007, 2009), as well as Teobaldelli (2011), Teobaldelli and Schneider (2012), Schneider (2010), and Buehn and Schneider (2012).

Hence, it is helpful to analyze theoretically and empirically the effect of political institutions, like the Federal political system, on the shadow economy. If the development of the informal sector is viewed as a consequence of the failure of political institutions to set up or run an efficient market economy (where entrepreneurs go underground when there is inefficient public-goods provision), then the incentive of this situation to the individual to operate unofficially can be assessed. In a Federal system, competition among jurisdictions and the mobility of individuals act as constraints on politicians to adopt policies that are closer to a majority of voters' preferences. Frequently, the most efficient policies are those that are characterized by a certain level of taxation, mostly spent on productive public services. In fact, production in the formal sector benefits from a higher provision of productive public services and is negatively affected by taxation, while the shadow economy reacts in the opposite way. As fiscal policy gets closer to a majority of voters' preferences in Federal systems, the size of the informal sector goes down. This results in the hypothesis that the size of the shadow economy should be lower in a Federal system than in a unitary state, all other things being equal. Moreover, Teobaldelli and Schneider (2012) assert that direct democracy has a quantitative and statistically significant influence on the size of the shadow economy: the more direct democratic elements a country has, the smaller the shadow economy, again all other things being equal.

2.3.6 Tax morale

In addition to the effect of incentives discussed above, the efficiency of the public sector has an indirect effect on the size of the shadow economy: it affects tax morale. As Feld and Frey (2007) argue, tax compliance is driven by a psychological tax contract that entails rights for and obligations from taxpayers and citizens on the one hand, but also from the state and its tax authorities on the other hand. Taxpayers are more inclined to pay their taxes honestly if they get valuable public services in exchange. However, most taxpayers are honest even when the benefit principle of taxation does not hold, i.e., for redistributive policies, if the political decisions underlying such policies are applied fairly. Finally, the treatment of taxpayers by the tax authority counts. If taxpayers are treated like partners in a (tax) contract instead of subordinates in a hierarchical relationship, they will fulfill their obligations within the psychological tax contract more willingly. Feld and Frey (2007) and Kirchler (2007) present comprehensive evidence of the influence of such factors on tax compliance.

Regarding the impact of tax morale on the shadow economy, there is scarce evidence. Using data on the shadow economy derived from the MIMIC

approach, Torgler and Schneider (2009) report the most convincing evidence for a negative effect of tax morale. They particularly address causality issues and establish a causal negative relationship between tax morale and the size of the shadow economy. This effect is also robust for the inclusion of additional explanatory factors and specifications. These findings are in line with earlier preliminary evidence by Körner et al. (2006). Underpinned by survey data, Feld and Larsen (2005, 2009) likewise report a robust negative effect of tax morale in particular and social norms in general on the probability of respondents to conduct undeclared work. Interestingly, the estimated effects of social norms are quantitatively more important than the estimated deterrence effects. Van Eck and Kazemier (1988) also report a marginally significant effect of tax morale on participation in the hidden labor market.

2.3.7 Summary of the main causes of the shadow economy

In Table 2.2, an overview of a number of empirical studies summarizes the various factors influencing the shadow economy. The overview is based on studies where the size of the shadow economy was measured by the MIMIC or currency-demand approach. As there is no evidence of successful deterrence from these approaches–at least with respect to the broad panel data base on which this table draws–the most central policy variable does not show up. This is an obvious shortcoming of the studies, and it cannot be coped with easily due to the lack of internationally comparable deterrence data. In Table 2.2, two columns are presented, showing the various factors affecting the shadow economy with and without the independent variable of "tax morale." This table clearly demonstrates that an increase in taxes and social-security contributions is by far the single biggest contributor to expansion of the shadow economy. Indeed, this factor explains 35-38% or 45-52% of the variance in the shadow economy, with or without the inclusion of tax morale. When it is factored in, the variable tax morale accounts for 22-25% of variance in the shadow economy,[18] while "quality of state institutions" accounts for 10-12%, followed by "intensity of state regulation" (mostly for the labor market) with 7-9%. In general, Table 2.2 shows that the independent variable of the burden comprised of taxes and social-security payments, followed by those of tax morale and intensity of state regulations, are the three prime driving forces of the shadow economy.

[18] The importance of this variable with respect to theory and empirical relevance is also shown in Frey (1997), Feld and Frey (2002a, 2002b, 2007), and Torgler and Schneider (2009).

Table 2.2 Main Causes of the Increase of the Shadow Economy

Variable	Influence on the shadow economy (in %) [1)]	
	(a)	(b)
(1) Tax and Social-Security Contribution Burdens	35-38	45-52
(2) Quality of State Institutions	10-12	12-17
(3) Transfers	5-7	7-9
(4) Specific Labor-Market Regulations	7-9	7-9
(5) Public-Sector Services	5-7	7-9
(6) Tax Morale	22-25	-
Influence of all Factors	84-98	78-96

(a) Average values of 12 studies.
(b) Average values of empirical results of 22 studies.
Source: Schneider (2009)
[1)] This is the normalized or standardized influence of the variable average over the 12 studies in column (a) and the 22 studies in column (b)

3. Size and Progession of the Shadow Economies in 36 Countries

In Tables 3.1 to 3.4, the size of 31 European and five non-European shadow economies over the 2003-13 period is presented.[19] The size of the shadow economy of Turkey[20] had a value of 32.2% of official GDP in the year 2003,

[19] The calculation of the size and growth of the shadow economy is done with the MIMIC (Multiple Indicators and Multiple Courses) estimation procedure. Using the MIMIC estimation procedure, one gets only relative values, so one needs other methods, like the currency-demand approach, to calibrate the MIMIC values into absolute ones. For a detailed explanation, see Friedrich Schneider, editor, *Handbook on the Shadow Economy*, Cheltenham (UK): Edward Elgar Publishing Company, 2011.

[20] In this paper, the size and recent history of the shadow economy of Turkey, estimated by other authors, are not discussed anew. The most famous estimate, which runs from 1950 to 2010, comes from Elgin and Öztunali (2012). The size and development of the shadow economy of North-Cyprus is also not presented and discussed here. See, for example, Besim and Ekici (2013).

which then steadily declined to 28.4% by 2008, inched up to 28.9% in 2009, and has since fallen back to 26.5% in 2013 (forecast).[21] Among the western neighbors of Turkey, Bulgaria and Greece, the former had a shadow economy of 35.9% in 2003, which went down to 32.1% in 2008 but came back up to 32.5% in 2009, only to retreat again to 31.2% in 2013 (forecast). In Greece, there was a shadow economy of 28.2% in 2003, which shrank to 24.3% in 2008, expanded to 25.0% in 2009, but reversed itself to 23.6% in 2013 (forecast). On an EU-wide basis across all 27 member states, the average shadow economy in 2003 was 22.3% of official GDP, dipped to 19.2% in 2008, rose to 19.8% in 2009, and sank again, to 18.4%, in 2013 (Table 3.1). By comparison, the average of 31 European countries was 22.4% in 2003, 19.4% in 2008, 19.9% in 2009, and 18.5% in 2013 (Table 3.2). The history of the shadow economies of Australia, Canada, Japan, New Zealand, and the US display a similar movement over time (see Table 3.3)*;* in 2013, these five countries had, on average, a shadow economy that represented 8.6% of GDP, down from 9.7% in 2010.

If we look at the last two years (2012 and 2013) and compare them with 2008, we realize that most countries have experienced a contraction in the size of their "black" economies. This is due to the recovery from the worldwide economic and financial crises, which illustrates a noteworthy point: if an official economy is recovering or even booming, people have less incentive to undertake additional activities in the shadow economy and earn extra "black" money there. The only exceptions are Greece and Spain, where the recession in the official economy has been so severe as to even cut demand in the shadow economy, thanks to the traumatic hollowing out of the living standards of much of the populations in those countries. As a result, the Greek and Spanish shadow economies will fall back to 23.6% of official GDP in 2013, a lessening of 0.4 percentage point from 2012!

In Table 3.5, the shadow economies of Moldova, Ukraine, Romania, and Turkey are presented. Ukraine was in first place in 2000, with a value of 52.2% of official GDP, but by 2012 it had improved to 44.2% (forecast).

[21] The calculated values for 2013 are projections based on the forecasts of the official figures (GDP, unemployment, etc.) of these countries.

Table 3.1. Size of the Shadow Economy of 27 European Countries in 2003-13 (in % of off. GDP)

Country / Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Austria	10.8	11	10.3	9.7	9.4	8.1	8.47	8.2	7.9	7.6	7.5
Belgium	21.4	20.7	20.1	19.2	18.3	17.5	17.8	17.4	17.1	16.8	16.4
Bulgaria	35.9	35.3	34.4	34	32.7	32.1	32.5	32.6	32.3	31.9	31.2
SouthCyprus	28.7	28.3	28.1	27.9	26.5	26	26.5	26.2	26	25.6	25.2
Czech Republic	19.5	19.1	18.5	18.1	17	16.6	16.9	16.7	16.4	16.0	15.5
Denmark	17.4	17.1	16.5	15.4	14.8	13.9	14.3	14	13.8	13.4	13.0
Estonia	30.7	30.8	30.2	29.6	29.5	29	29.6	29.3	28.6	28.2	27.6
Finland	17.6	17.2	16.6	15.3	14.5	13.8	14.2	14	13.7	13.3	13.0
France	14.7	14.3	13.8	12.4	11.8	11.1	11.6	11.3	11	10.8	9.9
Germany	17.1	16.1	15.4	15	14.7	14.2	14.6	13.9	13.7	13.3	13.0
Greece	28.2	28.1	27.6	26.2	25.1	24.3	25	25.4	24.3	24.0	23.6
Hungary	25	24.7	24.5	24.4	23.7	23	23.5	23.3	22.8	22.5	22.1
Ireland	15.4	15.2	14.8	13.4	12.7	12.2	13.1	13	12.8	12.7	12.2
Italy	26.1	25.2	24.4	23.2	22.3	21.4	22	21.8	21.2	21.6	21.1
Latvia	30.4	30	29.5	29	27.5	26.5	27.1	27.3	26.5	26.1	25.5
Lithuania	32	31.7	31.1	30.6	29.7	29.1	29.6	29.7	29.0	28.5	28.0
Luxembourg	9.8	9.8	9.9	10	9.4	8.5	8.8	8.4	8.2	8.2	8.0
Malta	26.7	26.7	26.9	27.2	26.4	25.8	25.9	26	25.8	25.3	24.3
Netherlands	12.7	12.5	12	10.9	10.1	9.6	10.2	10	9.8	9.5	9.1
Poland	27.7	27.4	27.1	26.8	26	25.3	25.9	25.4	25	24.4	23.8
Portugal	22.2	21.7	21.2	20.1	19.2	18.7	19.5	19.2	19.4	19.4	19.0
Romania	33.6	32.5	32.2	31.4	30.2	29.4	29.4	29.8	29.6	29.1	28.4
Slovenia	26.7	26.5	26	25.8	24.7	24	24.6	24.3	24.1	23.6	23.1
Spain	22.2	21.9	21.3	20.2	19.3	18.4	19.5	19.4	19.2	19.2	18.6
Slovakia	18.4	18.2	17.6	17.3	16.8	16	16.8	16.4	16	15.5	15.0
Sweden	18.6	18.1	17.5	16.2	15.6	14.9	15.4	15	14.7	14.3	13.9
United Kingdom	12.2	12.3	12	11.1	10.6	10.1	10.9	10.7	10.5	10.1	9.7
27 EU-Countries / Average (unweighted)	**22.3**	**21.9**	**21.5**	**20.8**	**19.9**	**19.2**	**19.8**	**19.6**	**19.2**	**18.9**	**18.4**

Source: Own Calculations, December 2012

Table 3.2. Size of the Shadow Economy of Four European Countries (Non EU-Members) in 2003-13 (in % of off. GDP)

Country / Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Croatia	32.3	32.3	31.5	31.2	30.4	29.6	30.1	29.8	29.5	29.0	28.4
Norway	18.6	18.2	17.6	16.1	15.4	14.7	15.3	15.1	14.8	14.2	13.6
Switzerland	9.5	9.4	9	8.5	8.2	7.9	8.3	8.1	7.8	7.6	7.1
Turkey	32.2	31.5	30.7	30.4	29.1	28.4	28.9	28.3	27.7	27.2	26.5
4 Non EU-Countries / Average	**23.2**	**22.9**	**22.2**	**21.6**	**20.8**	**20.2**	**20.7**	**20.3**	**19.9**	**19.5**	**18.9**
Unweighted Average of all 31 European Countries	**22.4**	**22.1**	**21.6**	**20.9**	**20.1**	**19.4**	**19.9**	**19.7**	**19.3**	**19.0**	**18.5**

Source: Own Calculations, December 2012

Table 3.3. Size of the Shadow Economy of Five Highly Developed Non- European Countries in 2003-13 (in % of off. GDP)

Country / Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Australia	13.7	13.2	12.6	11.4	11.7	10.6	10.9	10.3	10.1	9.8	9.4
Canada	15.3	15.1	14.3	13.2	12.6	12	12.6	12.2	11.9	11.5	10.8
Japan	11	10.7	10.3	9.4	9	8.8	9.5	9.2	9	8.8	8.1
New Zealand	12.3	12.2	11.7	10.4	9.8	9.4	9.9	9.6	9.3	8.8	8.0
United States	8.5	8.4	8.2	7.5	7.2	7	7.6	7.2	7	7.0	6.6
Other OECD Countries / Unweighted Average	**12.16**	**11.92**	**11.42**	**10.38**	**10.06**	**9.56**	**10.1**	**9.7**	**9.46**	**9.18**	**8.6**

Source: Own Calculations, December 2012

Table 3.4. Size of the Shadow Economy of Various Groupings in 2003-13 (in % of off. GDP)

Averages / Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
27 EU-Countries / Average (unweighted)	22.3	21.9	21.5	20.8	19.9	19.3	19.8	19.5	19.4	18.9	18.4
4 Non EU-Countries / Average (unweighted)	23.2	22.9	22.2	21.6	20.8	20.2	20.7	20.3	20.0	19.5	18.9
5 Other OECD Countries / Average (unweighted)	12.2	11.9	11.4	10.4	10.1	9.6	10.1	9.7	9.5	9.18	8.6
All 36 Countries / Average (unweighted)	**21.0**	**20.7**	**20.2**	**19.4**	**18.7**	**18.0**	**18.5**	**18.3**	**18.0**	**17.6**	**17.1**

Source: Own Calculations, December 2012

Table 3.5. Size of the Shadow Economies of Moldova, Ukraine, and Romania in 2000-10, Based on the MIMIC Method Forestimation and Benchmark Values from the Currency-Demand Method

Country	Size of the shadow economy in % of real GDP												
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Moldova	45.3%	44.2%	43.8%	43.5%	43.0%	42.8%	42.5%	42.3%	42.0%	42.3%	41.8%	40.7%	40.2%
Ukraine	52.2%	51.4%	50.8%	49.7%	48.8%	47.8%	47.3%	46.8%	46.2%	46.2%	45.1%	44.6%	44.2%
Romania	34.4%	33.9%	33.6%	33.6%	32.5%	32.2%	31.4%	30.2%	29.4%	29.4%	29.8%	29.6%	29.1%
Turkey	--	--	--	32.2%	31.5%	30.7%	30.4%	29.1%	28.4%	28.9%	28.3%	27.7%	27.2%

Source: Calculation by Friedrich Schneider, University of Linz, Austria, August 2012.

Next comes Moldova, with a value of 45.3% in 2000, dropping to 42.0% in 2008, rising slightly to 42.3% in 2009, and then settling at 40.2% in 2012 (forecast). Romania had the smallest shadow economy in this group, with 34.4% in 2000; after more than a decade of steady progress, it reached 2012 with a far better value: 29.1% (forecast).

Three interesting facts emerge in connection with the size of the shadow economies:

(1) The eastern countries, or the "new" European Union members, such as Bulgaria, South-Cyprus, the Czech Republic, Latvia, Lithuania, and Poland have larger shadow economies than such "old" European Union countries as Austria, Belgium, Germany, and Italy; therefore, one can observe that the size of the shadow economy grows as we move from west to east.

(2) A similar phenomenon is seen on a north-south axis. On average, the southern European countries have considerably larger shadow economies than do those of Central and Western Europe. This is confirmed in Figures 3.1 and 3.2.

(3) The five other highly developed OECD countries (Australia, Canada, Japan, New Zealand, and the United States, in Table 3.3) have much smaller shadow economies, with 10.1 % of GDP on average in 2009, which tumbled to 9.2% in 2012.

4. Shadow Economies in Highly Developed OECD Countries: What are the Driving Forces?

Two papers, by Friedrich Schneider and Andreas Buehn, 2013, and Andreas Buehn and Friedrich Schneider, 2012, described new investigations to tackle two questions:

(1) What are the driving forces of the shadow economy in highly developed OECD countries?

(2) Can we calculate the extent of tax evasion in OECD countries over the 1999-2010 period[22]?

[22] Compare with the studies of Schneider, Friedrich and Buehn, Andreas (2013) and Buehn and Schneider (2012).

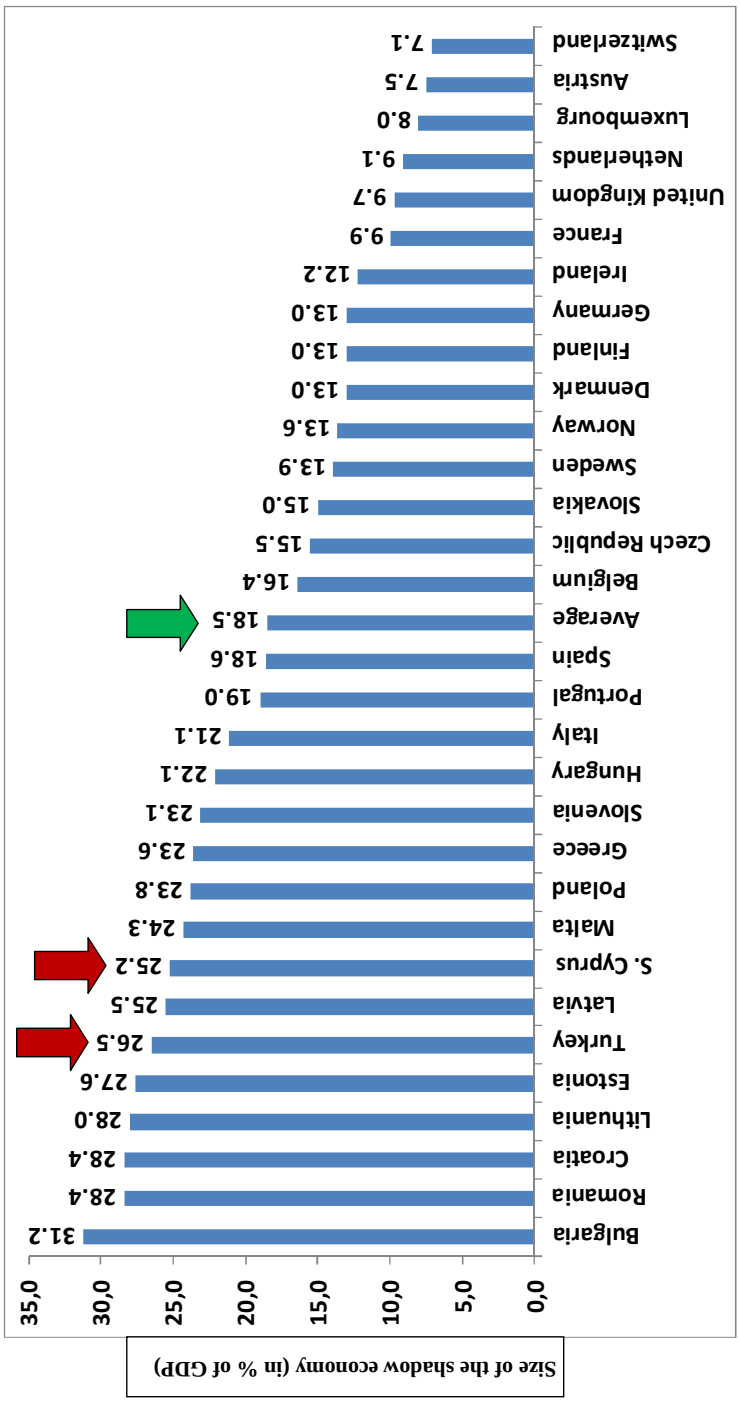

Figure 3.1. Size of the Shadow Economy of 31 European Countries in 2013 (in % of off. GDP)

Source: Own calculations, December 2012

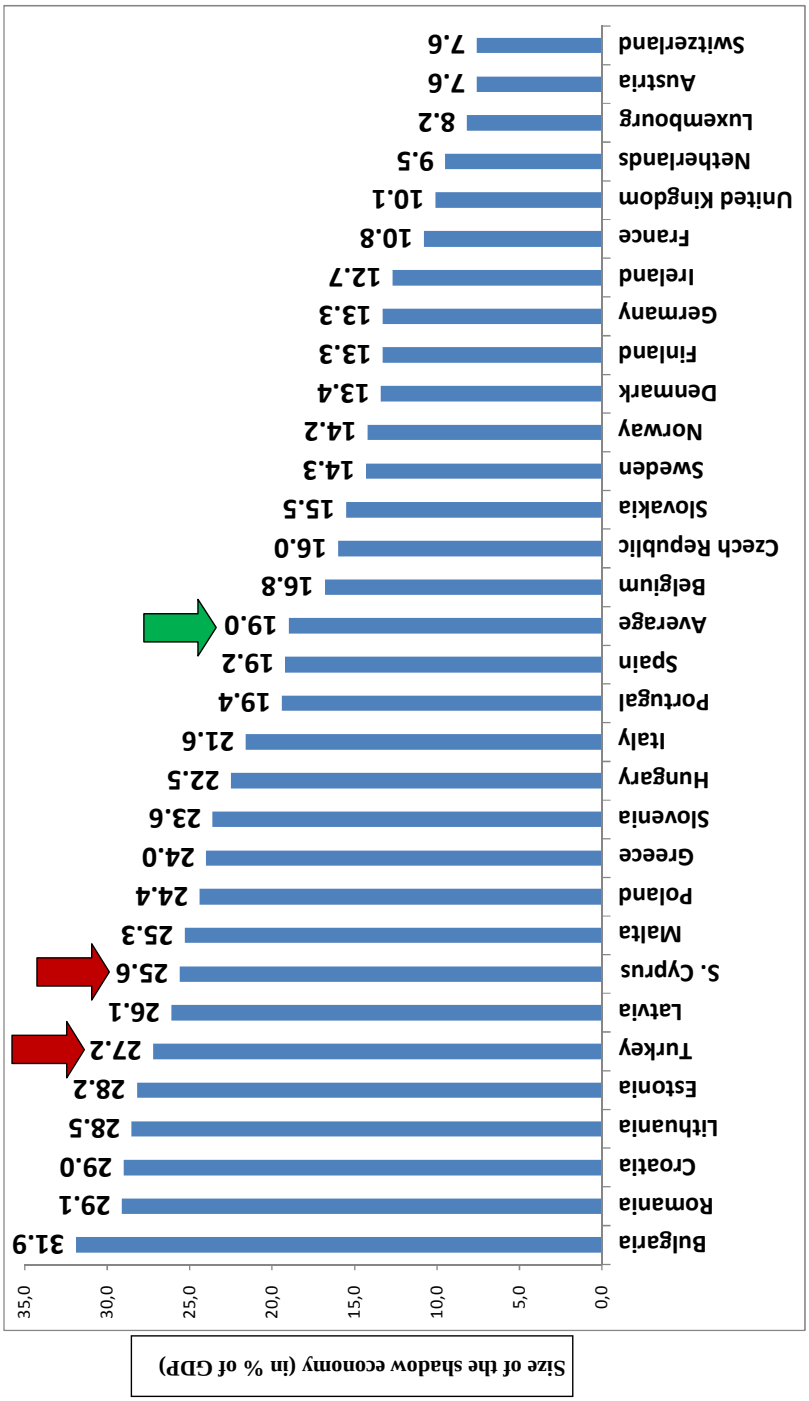

Figure 3.2. Size of the Shadow Economy of 31 European Countries in 2012 (in % of off. GDP)

Source: Own calculations, March 2012

Table 4.1. Average Relative Impact (in %) of the Causal Variables on the Shadow Economy of 38 OECD Countries from 1999 to 2010

Country	Average size of the shadow economy	Personal income tax	Indirect taxes	Tax morale	Unem-ployment	Self-employ-ment	GDP growth	Business freedom
Australia	13.8	12.4	13.4	14.1	18.1	15.8	13.2	13.0
Austria	9.8	12.4	14.6	14.1	11.8	16.8	15.9	14.4
Belgium	21.5	12.9	12.8	14.4	16.2	16.0	14.2	13.3
Bulgaria	34.6	14.9	13.5	14.8	14.8	14.2	13.7	14.2
Canada	15.6	12.7	14.9	14.9	18.4	11.7	13.8	13.6
Chile	19.4	16.1	14.1	14.1	14.2	12.9	14.4	14.3
South-Cyprus	27.2	13.8	14.5	14.5	14.3	14.5	13.8	14.6
Czech Rep.	17.6	15.1	16.0	14.0	11.5	13.1	14.3	15.9
Denmark	17.3	10.8	13.1	14.7	18.2	15.6	14.4	13.2
Estonia	21.7	16.4	14.4	14.5	12.4	13.1	14.0	15.2
Finland	17.4	15.4	13.0	14.8	12.9	16.9	13.7	13.3
France	14.8	9.1	14.4	14.8	15.1	17.3	15.1	14.3
Germany	15.7	16.6	13.2	15.0	13.0	12.8	15.2	14.2
Greece	27.0	10.3	16.2	14.5	10.4	18.7	14.3	15.5
Hungary	24.1	14.0	14.1	15.0	15.0	14.2	13.5	14.2
Iceland	15.2	12.4	14.3	14.7	15.1	14.4	14.8	14.3
Italy	26.9	13.0	13.9	14.0	14.5	14.0	16.6	13.9
Korea	26.3	13.3	14.4	14.9	13.3	14.6	15.3	14.2
Latvia	22.2	14.6	14.3	13.9	15.1	14.6	13.3	14.2
Lithuania	25.4	13.1	14.5	14.1	15.1	14.5	14.2	14.5
Luxembourg	9.6	14.7	14.3	14.2	13.0	14.9	14.5	14.3
Malta	27.3	14.3	14.3	15.1	14.3	14.3	13.4	14.3
Mexico	30.0	14.3	13.7	14.5	14.4	14.2	14.9	13.9
Netherlands	13.2	14.6	13.6	14.0	16.1	13.7	14.2	13.8
New Zealand	12.2	14.6	14.2	14.2	15.2	14.3	13.2	14.2
Norway	18.6	14.1	13.8	14.2	14.1	14.5	15.4	13.9
Poland	26.4	14.1	14.4	14.4	14.2	14.5	14.1	14.4
Portugal	22.7	12.5	14.1	14.9	14.2	14.4	15.9	14.1
Romania	32.2	15.5	14.2	13.9	14.2	14.1	14.0	14.2
Slovak Rep.	17.5	15.0	14.7	14.7	14.4	14.4	12.0	14.8
Slovenia	25.2	14.4	14.3	14.4	14.8	14.4	13.2	14.4
Spain	22.8	11.2	13.6	14.6	17.5	16.4	13.8	12.9
Sweden	18.6	14.9	14.3	14.6	13.3	14.2	14.2	14.5
Switzerland	8.3	13.8	13.0	15.7	13.4	14.4	14.8	14.8
Turkey	30.6	13.9	14.1	14.5	13.7	14.5	15.1	14.3
United Kingdom	12.5	13.6	14.0	14.3	18.1	12.4	13.7	14.0
United States	8.7	13.9	14.1	13.7	14.9	14.4	15.0	14.1
Average	20.3	13.8	14.1	14.5	14.6	14.6	14.3	14.2

Source: Schneider and Buehn (2013).

Table 4.2. Extent of Tax Evasion (in % of GDP) in 38 OECD Countries, Assuming Indirect Taxation and Self-Employment as Driving Forces

Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Average
Australia	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.8	1.7	1.5	1.5	1.6	1.8
Austria	1.6	1.5	1.4	1.5	1.5	1.5	1.5	1.4	1.3	1.2	1.1	1.4	1.4
Belgium	2.8	2.6	2.6	2.6	2.7	2.6	2.6	2.4	2.2	2.0	1.9	2.1	2.4
Bulgaria	6.8	6.4	6.2	6.3	6.4	6.1	5.9	5.5	5.1	4.8	4.4	4.8	5.7
Canada	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.8	1.7	1.5	1.5	1.7	1.9
Chile	4.5	4.2	4.1	4.2	4.3	4.1	4.0	3.7	3.5	3.3	3.4	3.7	3.9
South-Cyprus	6.3	5.9	5.7	5.8	6.0	5.9	5.7	5.3	5.0	4.7	4.4	4.5	5.4
Czech Rep.	3.4	3.2	3.2	3.2	3.3	3.2	3.0	2.8	2.5	2.1	2.1	2.3	2.9
Denmark	2.6	2.4	2.4	2.5	2.5	2.4	2.4	2.2	2.0	1.7	1.7	1.9	2.2
Estonia	-	3.7	3.6	3.7	3.7	3.5	3.4	3.1	2.9	2.5	2.8	2.8	3.2
Finland	2.7	2.5	2.4	2.5	2.5	2.5	2.4	2.2	2.1	1.9	1.8	2.0	2.3
France	2.0	1.9	1.8	1.9	1.9	1.9	1.8	1.7	1.6	1.4	1.4	1.6	1.7
Germany	2.2	2.1	2.0	2.1	2.2	2.1	2.1	1.9	1.8	1.6	1.5	1.7	1.9
Greece	5.6	5.3	5.2	5.3	5.3	5.1	5.0	4.6	4.4	4.0	3.7	4.0	4.8
Hungary	4.5	4.2	4.1	4.1	4.2	4.1	4.0	3.7	3.6	3.2	3.0	3.3	3.8
Iceland	3.0	2.9	2.8	2.9	3.0	2.8	2.7	2.5	2.3	2.0	2.1	2.3	2.6
Ireland	3.1	2.9	2.8	2.9	3.0	2.9	2.8	2.6	2.6	2.4	2.5	2.6	2.8
Italy	4.6	4.2	4.1	4.2	4.4	4.3	4.2	4.0	3.8	3.4	3.3	3.6	4.0
Korea	6.7	6.2	6.0	6.1	6.2	6.0	5.9	5.5	5.2	4.7	4.3	4.8	5.6
Latvia	3.7	3.5	3.4	3.4	3.4	3.3	3.2	2.9	2.7	2.7	2.3	2.7	3.1
Lithuania	4.1	3.9	3.8	3.8	3.8	3.6	3.5	3.2	3.1	3.1	2.7	3.2	3.5
Luxembourg	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.2	1.1	1.0	1.2	1.3

Table 4.2. Extent of Tax Evasion (in % of GDP) in 38 OECD Countries, Assuming Indirect Taxation and Self-Employment as Driving Forces

Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Average
Malta	5.5	5.2	5.1	5.3	5.4	5.3	5.2	4.8	4.6	4.2	4.0	4.6	4.9
Mexico	7.7	7.1	7.1	7.3	7.5	7.2	7.1	6.5	6.1	5.8	5.6	6.2	6.8
Netherlands	2.3	2.1	2.1	2.2	2.3	2.2	2.2	2.0	1.9	1.7	1.7	1.9	2.0
New Zealand	2.1	1.9	1.9	1.9	1.9	1.8	1.8	1.7	1.6	1.5	1.4	1.6	1.8
Norway	2.8	2.7	2.6	2.7	2.7	2.6	2.6	2.4	2.3	2.0	2.0	2.2	2.5
Poland	4.9	4.6	4.6	4.7	4.8	4.6	4.5	4.2	3.8	3.4	3.2	3.5	4.2
Portugal	4.6	4.3	4.2	4.4	4.6	4.5	4.4	4.2	3.9	3.4	3.3	3.7	4.1
Romania	7.0	6.7	6.5	6.6	6.6	6.3	6.2	5.6	5.4	5.0	4.6	5.2	6.0
Slovak Rep.	2.8	2.7	2.6	2.7	2.7	2.6	2.5	2.3	2.1	1.9	1.8	1.9	2.4
Slovenia	5.0	4.7	4.6	4.7	4.8	4.6	4.5	4.1	4.0	3.5	3.2	3.6	4.3
Spain	3.2	3.0	2.9	3.0	3.0	3.0	2.9	2.8	2.6	2.5	2.5	2.7	2.8
Sweden	2.8	2.6	2.6	2.6	2.7	2.6	2.5	2.4	2.2	2.0	1.9	2.2	2.4
Switzerland	1.6	1.5	1.4	1.5	1.6	1.5	1.4	1.3	1.2	1.0	1.0	1.2	1.4
Turkey	7.8	7.3	7.4	7.5	7.5	7.1	6.8	6.3	5.7	5.3	5.3	5.7	6.7
UK	2.1	1.9	1.9	1.9	2.0	1.9	1.9	1.8	1.7	1.5	1.6	1.6	1.8
United States	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5
Average	3.6	3.4	3.4	3.4	3.5	3.4	3.3	3.1	2.9	2.6	2.5	2.8	3.2

Source: Buehn and Schneider (2012).

Table 4.1 shows the average relative impact (in percent) of the shadow-economy determinants in 38 OECD countries over the 1999-2010 period. Unemployment and self-employment obviously had the greatest average impact, 14.6%, on the shadow economies of the 38 OECD countries during this-time. The second strongest determinant was tax morale, with 14.5%, followed by GDP growth at 14.3% and business freedom at 14.2%. Turkey has a slightly different profile. GDP growth was the strongest shaper of the size of the Turkish shadow economy, with 15.1%, followed by tax morale and self-employment (14.5%), then business freedom (14.3%).

Finally, Table 4.2 lays out the bite that tax evasion takes out of the official GDP in 38 OECD countries, with indirect taxation and self-employment assumed to be driving forces. Notably, from an OECD-wide average tax-evasion rate of 3.6% in 1999, an improvement in tax compliance was registered by 2010: tax evasion had fallen to 2.8%. In Turkey, the value was 7.8% in 1999, which more or less steadily fell (with some ups and downs) to 5.7% by 2010. That means that the Turkish government was, to a certain extent, successful in fighting tax evasion.[23]

5. Concluding Remarks

In general, it appears that dynamic and interesting features characterize shadow economies and their causative factors, with a different profile of these showing up in each of these 38 OECD countries. Also, the tax-evasion figures point to a variety of situations throughout the OECD, and they have been computed for the first time on a longer time-series basis, to be presented here.

[23] The precise calculation that produced these figures is shown in the paper by Buehn and Schneider (2012). The figures were developed from a MIMIC estimation of the shadow economies of these 38 countries. A shadow economy is broken down into illegal and "legal" (explicit) activities (those carried out in the shadow economy, e.g., repairing a car or building a house), from which the tax-evasion figures were derived.

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