

# Deterrence Policy and the Size of the Shadow Economy in Germany:

## An institutional and empirical analysis

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### Abstract

Traditional Allingham-Sandmo-type theory of tax evasion stresses deterrence: Higher expected punishment is alleged to cause lower tax evasion and undeclared work. Thus, deterrence measures appear to be the most favored policy instruments in almost all OECD countries. Still, when it comes to field data outside the U.S, empirical evidence on this relation is rather scarce. In this paper, we survey the legal environment of deterrence policy in Germany and present new long-run time series of measures for deterrence as well as for the shadow economy in Germany. These two sets of time series data are connected by a first econometric analysis on their causal relationship using Granger causality tests.

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## Introduction

As recently spotlighted by the cases of tax evasion by German taxpayers at Liechtenstein banks, the most important policy practice to fight tax evasion and undeclared work in OECD countries is to increase fines or investigation efforts of tax authorities. In these recent cases investigation efforts and hence expectations of detection were emphasized. The German tax authorities (even more mysteriously, actually the German secret service) paid five million Euros to an informant in order to get their hands on confidential bank customer data.

In economic theory such deterrence measures as remedy against tax evasion and undeclared work are founded in the economics of crime pioneered by Becker (1968). He theoretically argued that costs and benefits determine criminal behavior. According to this theory, expected punishment is the cost each criminal faces for committing a crime or as Gneezy and Rustichini (2000) coined it: a fine is a price. The higher the expectations about detection, the higher the real detection efforts and the higher the fine, the more it deters from committing a crime. On the contrary on the benefit-side, the incentives to commit a crime are the stronger the higher the expected gains from crime. Allingham and Sandmo (1972) applied this approach to tax evasion, and enhanced it by taking individual risk preferences and risk aversion into account. In this frame, it turns out to be theoretically ambiguous how the (true) personal income and the marginal tax rate as the most important determinants of the benefits of tax evasion affect tax compliance. Thus, the cost components of crime, fines, auditing and investigations remain the most important explanation for tax compliance and the one policy implications are most easily to be connected to.

German criminal tax law development in the last years supports this attitude: In 2004 the “*Black Activities’ Act*” or more exactly the “*Law to intensify the fight against black activities and accompanying tax evasion*” (SchwarzArbG, Bundesrats-Drucksache 155/04a) passed both houses of parliament by comfortable majorities. This new legislation allows for more intensive tax auditing by the finance control unit “black activities” (Finanzkontrolle Schwarzarbeit, FKS), but also imposes higher fines in order to raise tax compliance in Germany.

In the empirical literature, deterrence measures as instruments to fight tax evasion have not remained uncontested (for surveys see Andreoni, Erard and Feinstein 1998, Slemrod and Yitzhaki 2002, Torgler 2003, Braithwaite and Wenzel 2006). From a birds-eye-perspective fines and tax auditing are unable to explain the actual level of tax compliance as they are too

low to provide effective deterrence in most OECD countries (Graetz and Wilde 1985, Pommerehne and Frey 1992). Alm, McClelland and Schulze (1992) even contend that, given the rather low level of fines and intensity of control, the real enigma of tax evasion consists in the question why taxpayers honestly pay taxes (the “tax compliance puzzle”). Moreover, the empirical evidence on the specific partial impact of tax auditing and fines on tax evasion and the shadow economy, which mainly comes from experimental studies and field studies in the U.S., is not unambiguous. Dubin, Graetz and Wilde (1987), Dubin and Wilde (1988), Beron, Tauchen and Witte (1992) and Slemrod, Blumenthal and Christian (2001) report a significantly positive effect of tax auditing on tax evasion at least for a part of the income groups investigated. While Schwartz and Orleans (1967), Friedland, Maital and Rutenberg (1978), Klepper and Nagin (1989), De Juan, Lasheras and Mayo (1994), Alm, Sanchez and De Juan (1995) and Blackwell (2010) report a positive influence of fines on tax compliance, the results offered by Spicer and Lundstedt (1976), Friedland (1982), Elffers, Weigel and Hessing (1987) and Varma and Doob (1998) are mixed. In a study for Switzerland, Frey and Feld (2002) find a positive impact of fines, but a negative impact of tax auditing on tax compliance. Martinez-Vazquez and Rider (2005) report evidence for the U.S. that enforcement efforts affect the mode of tax evasion targeted by these efforts negatively, but the untargeted mode positively (as a substitution effect). While they find an overall positive effect of enforcement on tax compliance, it remains generally open whether the unintended side effect on the untargeted mode over-compensates the intended effect.

Taken this empirical ambiguity, doubts on the exclusive reliance on deterrence to reduce tax evasion and undeclared work emerge. Frey (1997) argues that tax compliance results from an intrinsic motivation to pay taxes and hence from tax morale. Such an intrinsic motivation can however be crowded out by auditing and fines, e.g., if taxpayers perceive a higher control intensity as an unjustified intrusion into their private lives. Tax compliance can thus be enhanced if tax authorities treat taxpayers in a friendly way (Feld and Frey 2002, 2002a). All in all, the relationship between tax authorities and taxpayers is much more complex than the economic theory of crime suggests (Feld and Frey 2007).<sup>1</sup> The mixed and even contradictory results obtained in the literature up to now seem to call for additional evidence.

In this paper we will present some additional evidence about the shadow economy and deterrence policy by presenting time series data from Germany. This approach provides interesting insights: First, as there are not many studies using European and especially German

data, and second, as expected punishment is not an explanatory variable in the most prominent studies for Germany (Schneider and Enste 2000, Schneider 2004, Kanniainen, Pääkkönen and Schneider 2004). Our aim is to provide some new data and basic insights into the following research question: Do policies that raise deterrence measures work to fight the shadow economy? As working hypothesis, we consider three answers into causality directions to be convincing: First, more severe deterrence measures cause lower undeclared work and tax evasion, or second, on the contrary, deterrence may lead to a crowding out effect of tax morale and thus an increased shadow economy, and third, a higher shadow economy may cause a policy of more severe deterrence. The approach used is an explorative and mainly descriptive analysis focusing German macro-data which was not systematically collected before. We survey research into the German shadow economy and its measurement and combine that with a portrayal of the institutional environment and practice of the deterrence policy from 1970 to 2005. To derive some first insights into the mentioned causality directions we finally link both parts with a first granger causality test.

The remainder of the paper is structured as follows: In Section 2, we first discuss the state, methods and data of empirical research in the field of shadow economy and tax evasion and second, assess the size and development of the shadow economy in Germany as a first proxy for further analyses. Section 3 characterizes the legal foundations as well as the practice of fines and sentences and its development. In Section 4 we provide time series about the probability of detection in terms of auditing as the second determinant of expected punishment. In Section 5, we link the preceding descriptive empirics with Granger causality tests on the impact of deterrence on the size of the shadow economy, while the results are summarized in Section 6.

## **2 Empirical research into tax evasion and shadow economy**

### **2.1 Shadow economy, undeclared work, tax evasion and tax morale**

The terms and scope of this inquiry in the interconnected fields of research into shadow economy and tax evasion needs to be rendered more precisely (for broader discussions see Schneider and Enste 2000, Feld and Larsen 2005, 2010). We do so to shed some light on the possibilities and restrictions for empirical studies in the field. The term shadow economy mainly refers to its property of being hidden. It includes economically legal but hidden activities in the sense of black work as well as some illegal hidden activities like trade of illicit drugs or prostitution. The first part, legal undeclared work in the shadow economy usually involve tax

evasion, but taxes could also be evaded pursuing different activities than those in the shadow economy. This is, e.g., the case when capital income earned officially is not truthfully reported. Tax compliance can be understood, in contrast to the tax gap, as the amount of the projected total tax base that tax authorities actually collect (Andreoni, Erard and Feinstein 1998). At last tax morale traditionally refers to the residuum of tax compliance which cannot be explained by standard portfolio choice determinants and the deterrence measures.

These terms and activities are overlapping to a certain extent and are of very clandestine nature. As we will see, it will not be a question of taxonomical precision, but of measurability which activity we use as approximation for the further empirical analysis. Hence, we will further focus on economically legal but illegally hidden activities and leave other criminal activities aside. Also we focus on the criminal tax code and audits rather than general criminal law.

## **2.2 Studies of tax compliance and tax morale**

Nowadays' citations give the impression that economic studies on shadow economy or undeclared work, tax compliance and tax morale has started recently. Nevertheless, analyses of tax compliance and tax evasion have a long tradition in German public finance.

The empirical examination of tax evasion in Germany started with the works of Schmölders (1932, 1960, 1964, 1970, 1978). In his inaugural lecture about “tax morale and tax mentality” at Humboldt University in 1932, he adopted an interdisciplinary approach using both insights from psychology and economics. He conceptualized basic ideas like the subjectively perceived tax burden in different groups of taxpayers or stressed the importance of taxpayers' attitude towards the state or his satisfaction with policies for tax compliance. Long before the “tax compliance puzzle” following the Allingham/Sandmo-type rational portfolio-choice-theory was recognized, he explored why taxpayers contribute to the “bonum commune” deliberately. For him, the key explanation can be found in the psychological sphere of values and attitudes. He understood “tax mentality” as a combination of general attitudes, norms and beliefs about the state, its provision of public goods and its financial basis. On this background, “tax morale” is the attitude towards a) the duty to pay his taxes correctly and b) the criminal act of evasion compared to other offences. He conducted interviews to measure tax mentalities and morale and added the tax authorities' behavior and the revenue situation to his data, comparing different countries' tax morale, tax mentalities and institutions in their impact on tax compliance.

However, neither hard measures of tax evasion nor theoretical models are constructed in this

work, and no hypotheses are econometrically tested. Yet, the conclusion of five key factors that shape “tax compliance” fit to today’s insights: First, the importance of the appropriateness of the overall level of the tax burden, second, a fair distribution of tax burdens among taxpayers, third, the treatment of the taxpayer by the tax authorities, fourth, an efficient government spending, and finally, the importance of the benefit principle of taxation, i.e. an equivalence between taxes and public goods in each group of taxpayers (Mackscheidt 1994, 2004). Schmolders and Strümpel (1969) compared tax mentality and tax evasion in Great Britain, France, Italy and Spain. Schmolders Institute for Empirical Socio-Economics (Forschungsinstitut für empirische Sozialökonomik, abbr. FORES) continued his work and published several continuous surveys about “The Tax Mentality of German Taxpayers”.<sup>2</sup> While these studies captured many aspects of modern tax morale research, they did neither measure the shadow economy or the levels tax evasion, nor did they focus on the impact of deterrence on tax compliance.

### **2.3 Measuring the shadow economy, tax evasion and tax morale**

Data on the size of the shadow economy, its partial activities and even more on the extent of tax evasion are not easily available for Germany because of their very clandestine nature and the fiscal secrecy laws in Germany. Thus, several estimation methods have been developed to “measure the unmeasurable” which are usually linked to the one or the other aspect of tax evasion (Thomas 1999, Schneider and Enste 2000, Pedersen 2003, Lyssiotou, Pashardes and Stengos 2004 and Feld and Larsen 2005, 2010). Some of the methods rather capture the shadow economy or undeclared work by focusing on the labor market, physical production or particular economic transactions. Others aim at an assessment of tax compliance.

There are *indirect* and *direct methods* of measurement (see *Table 1*). The *first indirect method* is called the *income gap approach*. It uses the basic definition in national accounts that the income measure should be the same as the expenditure measure of the domestic product. If there are statistical discrepancies, they might occur because the quality of the data is insufficient. However, it is highly implausible that these statistical discrepancies increase substantially over time. Thus, tax evasion explains why people in an economy buy more products and services than they officially have money for, given their earned income according to income tax declarations. In Europe, Larsen (2002) applies this method for Denmark, while Weck-Hannemann and Pommerehne (1989), Pommerehne and Weck-Hannemann (1996), Pommerehne and Frey (1992), Frey (1997), Feld and Frey (2002) and Frey and Feld (2002) use it

to measure Swiss tax evasion. In a similar fashion, the official participation rate in the labor market can be compared with actual employment (Pedersen 2003).

The *second indirect measurement method* is based on monetary approaches. On the one hand, the *transactions approach*, starting from the Fisher equation of the quantity theory of money, relates total nominal GNP to total transactions. The GNP of the shadow economy is obtained by subtracting official GNP from total nominal GNP, assuming a base year in which the ratio of total transactions to total nominal GNP was normal, i.e., no shadow economy existed (Feige 1989). On the other hand, the *currency demand approach* assumes that transactions in the shadow economy are more strongly done in cash than transactions in the official economy in order to leave no accounting traces (Schneider 2004, Kirchgässner 1983). The size of the shadow economy is then inferred by simulating currency demand with and without tax variables.

The *third indirect method* is the *electricity consumption method* (Schneider and Enste 2000). It assumes that electricity serves as a good indicator of overall economic activity and that the electricity to GDP elasticity is close to one. Then, a calculation can be made of how large the actual total GDP of a country is. The difference from official GDP provides an estimate of the shadow economy. Schneider and Enste (2000) describe the more sophisticated econometric method developed by Lackó (1998) who uses household electricity consumption.

The *fourth indirect method* is the *hidden variable approach* (Frey and Weck-Hannemann 1984). Three or four macroeconomic indicators, usually the labor participation rate, real GDP growth, currency demand and working hours, are used as indicator variables for the shadow economy and linked to explanatory variables such as tax rates or the regulatory burden using LISREL techniques (structural causal modeling techniques, or DYMIMIC approach, Schneider and Enste 2000, IAW 2006). With the hidden variable approach, only a relative assessment of the size of the shadow economy is possible such that analyses using this method often relate their estimates to the currency demand approach (Pickhardt and Sardà 2006). In contrast to the income gap method, the latter three approaches capture activities in the shadow economy, but not overall tax evasion as they are not able to capture undeclared income from capital.

There are *three main direct methods*. The first focuses on undeclared work, as a part of the shadow economy, by using *surveys* in which individuals are directly asked whether they have carried out undeclared work, either for cash payments or payments in kind (Pedersen 2003, Feld and Larsen 2005). The second direct method, applied by the U.S. Internal Revenue

Service (IRS), is based on *actual tax auditing and other compliance methods* (Engel and Hines 1999). In 1963 the IRS started to conduct periodic tax audits (Taxpayer Compliance Measurement Program TCMP, later followed by the National Research Program, NRP) measuring understatement of income, overstatement of deductions and exemptions, etc., for a random sample of individual income taxpayers. The data are used to calculate tax evasion for the whole population. The IRS also applies an income gap method for non-filers by calculating the discrepancy between the declared income and actual income of randomly audited individuals (Andreoni, Erard and Feinstein 1998). The *third direct method* aims at *measuring tax morale* instead of tax evasion in surveys. For instance, the World Values Survey elicits tax morale for a representative sample of individuals (Torgler 2003). Torgler (2003a) and Feld and Torgler (2007) analyze the tax morale data for Germany.

**Table 1 about here**

Any of these indirect and direct methods has disadvantages. The income gap method has to cope with the unreliability of statistical errors. The monetary methods may over-estimate the rationality of the money market. In addition, many transactions in the shadow economy take place without cash payments. The electricity approach heavily depends on the assumption that undeclared work involves the use of electricity. As indirect methods minimize strategic problems that emerge if individuals are directly confronted with questions about tax honesty, it could be argued that the indirect methods provide for an upper boundary of tax evasion or the shadow economy. The survey approach is sensitive to the formulation of the questions, and participants in the survey may behave strategically and simply not tell the truth. Even in face-to-face interviews, which promote the greatest degree of participation in the survey, a respondent may simply lie. The survey method may thus measure a lower limit of undeclared work in the economy. The tax auditing method is prone to sample selection bias, because the selection for audit is based on the properties of the tax returns submitted to the tax office and thus not independent of the probability of evading taxes. Those taxpayers identified as tax cheaters could be the tip of the iceberg only, because it is highly improbable that tax authorities would detect all tax cheaters even if they wanted to. The survey of individual tax morale only measures hypothetical tax morale and not real tax compliance. Nevertheless all methods taken together describe recent possibilities to measure the phenomenon. Thus, in *Table 1* we provide an overview of the different estimates for Germany obtained from these methods.

If we look at the size of the shadow economy as measured by the transactions approach, it seems that this approach provides implausibly large estimates of the size of the German shadow economy. A size of the shadow economy of almost one third of the official economy in 1980, given that by nearly all other estimates of the shadow economy grew further in the nineties, would seem to be an overestimate. It thus appears to be more realistic to think of the income gap method as providing for the upper boundaries of tax non-compliance. This may indeed be reasonable, because the income gap method supposedly includes capital income tax evasion, so that it could produce a higher figure than measures that mainly focus on labor income. For the 1970s, the figures from the income gap method are larger than those from the currency demand or the hidden variable approaches. This qualitative evidence for Germany is corroborated to some extent by evidence from the U.S. and Switzerland. A comparison of the estimates of the extent of tax evasion produced by the auditing approach of the IRS (Engel and Hines 1999) with the figures of the shadow economy reported by Schneider and Enste (2000) using the currency demand approach shows that the former produces larger estimates of the tax evasion figures in the U.S. Although based on a micro-approach, it also uses an income gap measure. Similarly, the comparison of the extent of tax evasion according to the income gap and the shadow economy according to currency demand for Switzerland shows higher figures when using the income gap method (Feld and Frey 2005).

**Figure 1 about here**

Independent of which authors have conducted the analysis, the currency demand figures and those obtained from the hidden variable approach are relatively close together and slightly lower than those from the income gap method. The closeness of the outcomes of these two approaches is not really surprising, given the fact that the estimates of the shadow economy from the hidden variable approach are derived by taking point estimates from the currency demand approach. The greatest deviation results for the year 2000 with 1.3 to 1.6 percentage points. Both approaches show an increase of the size of the shadow economy during the 1980s and 1990s. This is illustrated by *Figure 1* that plots the joint model data of Pickhardt and Sardà (2006), which combine the currency demand and hidden variable estimates, and the currency demand data by Schneider (2006). According to the figures by Pickhardt and Sardà, the German shadow economy shows a steadily increasing trend with a peak in 1999 with only modest stagnation during the observed time period. Since 1999, a decrease can be observed. The data by Schneider (2006) show a peak in 2003 and a decline afterwards. Both series are relatively close together. Each explanation of the size of the shadow economy must be able to cope with that stylized fact

of a steady increase with a first observable decline since 1999 or 2003.

The figures from the surveys reported in *Table 1* do not give such a uniform picture. Admittedly, they are less systematically provided on a yearly basis and lack consistency across questionnaires and survey approaches. While the estimates reported by IfD Allensbach (1975) for 1975 cannot be evaluated due to the lack of further information, the results reported by Mummert and Schneider (2001) for 1998 and by Lamnek et al. (2000) for 1997 can be compared to those reported by Pedersen (2003) for 2001 and Feld and Larsen (2010) for 2004 to 2007. The latter two studies use almost the same questionnaire and sampling methods for their surveys. While the former two studies found much more considerable differences between West and East Germany than Pedersen, these differences are again remarkable in the Feld and Larsen study. Moreover, the proportion of respondents conceding that they had carried out undeclared work in the survey by Mummert and Schneider (2001) is double the proportion of people admitting that they conducted undeclared work for payments in cash or in kind in the survey by Pedersen (2003) and Feld and Larsen (2005). According to the information given in the survey on the number of black hours and the actual wages paid for undeclared work, this amounts to only 1.3 percent of GDP for Germany as a whole in 2001 and 1 percent in 2007. When the size of the shadow economy is measured assuming that labor productivity in the official and in the shadow economy is the same, the shadow economy decreased from 4.1 percent in 2001 to 3.2 percent in 2007. In line with the indirect methods, the survey method thus indicates a decline of the shadow economy in recent years like the estimates by Schneider (2006). The strong differences in the size of the shadow economy across approaches can be attributed to differences in the methods, but also to the fact that the surveys conducted up to now are focused on a smaller part of the shadow economy in the first place. They only ask households and dismiss any undeclared work between firms. Moreover, other illegal behavior or transactions than black work are not captured.

A similar development across time can be found for the assessment of tax morale using the WVS. Torgler (2003a) compared tax morale between East and West Germans after reunification. In his analysis for 1990, 67.2 percent of the East Germans stated that tax evasion is never justifiable, while at the same time only 40 percent of West German were of that opinion. In a subsequent study, Feld and Torgler (2007) use the most recent WVS data and find that tax morale in East and West Germany in 1999 is still significantly different from each other. They further provide evidence that the convergence in tax morale of both parts of Germany cannot be attributed to deterrence, but is the result of the East Germans' willingness to support the West

German welfare state. The share of respondents replying that tax evasion is not acceptable at all declined considerably during the 1980s, by more than 20 percent. Tax morale continued to increase again remarkably until the end of the 1990s. If this translated into a smaller amount of undeclared work or a higher tax compliance, perhaps after a time lag, as might be cautiously guessed from the slight decline in the shadow economy suggested by Schneider's (2004, 2006) recent estimates, it adds to the main stylized fact that needs to be explained: steady decreases in tax compliance until the end of the 1990's or beginning of the new millennium that appear to turn around afterwards.

If we try to sum up our survey about the investigation into the German shadow economy and tax compliance, we state a first stylized fact regarding the underground economic activity:

*Fact 1: The shadow economy and undeclared work in Germany steadily increased until the beginning of the new millennium and decreased afterwards, while tax morale in Germany declined and rose in about the same period.*

### **3 Fines and Punishment**

According to the prominent theoretical models in the literature, a reduction in the size of the shadow economy, if it indicates a trend reversal, could be the result of increased deterrence, tax or social policy reforms, or additional pressure from social norms. As the last of these develops slowly over time and is influenced by more important institutional changes, such as a shift in the tax authorities' treatment of taxpayers (Feld and Frey 2002a) or the introduction of direct democracy (Weck-Hannemann and Pommerehne 1989), we leave this possible explanation aside. The second explanation is difficult and complex to capture empirically. Here we will center on changes in deterrence. This is, however, rather difficult to do as well, because the administration of the German tax system is not uniform across the country, due both to the strong role that the state (*Länder*) administrations have in auditing and tax investigations and to the differences in the sentences imposed by the courts in different states. Nevertheless, we will try to put things into perspective, by first portraying the criminal tax code and the involved institutions and second by delivering facts and data about its developments over time.

#### **3.1 German criminal tax code in a nutshell**

The prosecution of tax evasion is legally founded in the eighth chapter (§§369-412) of the Abgabenordnung (general fiscal code; abbr. AO). There, tax offences are distinguished into tax

crimes and tax misdemeanors.<sup>3</sup> Tax crimes are distinct from tax misdemeanor by the deliberate act of tax evasion. Additionally, if not ruled differently in tax laws, the general criminal code (Strafgesetzbuch, abbr. StGB), the code of criminal procedure (Strafprozessordnung, abbr. StPO) and the regulatory offences act (Ordnungswidrigkeitengesetz, abbr. OWiG) apply. Underneath this level of statute law the administrative instructions for the crimes departments and the case law based on decisions of the Federal Finance Court (Bundesfinanzhof, abbr. BFH), which functions as appellate court, are of importance.

The main offence within the category of tax crimes is tax evasion (§370 AO). Tax evasion is committed by a) a misrepresentation or concealing of relevant information for taxation to tax authorities, by b) neglect of tax disclosure duties or by c) refraining from compulsory use of tax stamps. Tax evasion must be committed deliberately and the attempt is liable for prosecution also. The statutory limitation period for prosecution of tax crimes is 5 years (§78 StGB). But the limitation period for back duties is 10 years, and for back duties 6% interest per year is added.

Possible sentences for tax evasion range from a penalty to a prison sentence up to 5 years. In serious cases of tax evasion in combination with abuse of an evader's official authority or with fraudulent counterfeit the possible sentence ranges from a minimum of 6 months up to 10 years of imprisonment. If tax evasion is committed professionally or as an organized crime (§370a AO) the possible sentence is a minimum of 1 year up to 10 years of imprisonment. The sum of penalty depends on the amount of taxes evaded, the cooperation in the proceedings and the individual daily net income of the tax evader. Imposable penalties start at the equivalent of 6-times the daily net income of the tax evader and can be imposed up to 360-times the daily net income (while the accountable part of daily net income ranges from 1€ to 5.000€). For a more severe sentence the judge must impose a prison sentence.<sup>4</sup>

The Regional Tax Offices (Oberfinanzdirektion, abbr. OFD) have developed sentence tables for standard cases of tax evasion. They serve as basis for their demand of penalty by the crimes departments of the tax authorities in the proceedings. While the final sentence is decided by a judge and based on individual guilt and circumstances, the demand of the crimes department provides the framework for penalty sentences in case of conviction. In *Figure 2*, we show six examples for mild, average and severe sentencing demands.

**Figure 2 about here**

The main offence within the category of tax misdemeanors could be literally translated into tax

shortening (§378 AO). In comparison to tax evasion, tax shortening is not enacted deliberately but grossly negligent. Gross negligence is e.g. presumed, if the taxpayer does not hand in a tax return, does not inform himself about his tax duties or does not scrutinize the tax statement of his tax advisor. Tax shortening can also be conducted by tax advisors or accountants if they do not pay the necessary professional attention. In contrast to the Anglo-Saxon system tax misdemeanors in Germany can only be fined. For tax shortening a possible fine up to 50.000 € can be imposed. The statutory limitation period for prosecution of tax misdemeanors is 5 years (§384 AO). Other tax misdemeanors are the different acts of preparation of or assistance to tax evasion (§372-382 AO). Liable for prosecution are acts like fraud of documents adequate to achieve tax allowable expenses, violation of legal obligations to keep records, violation of obligations to notify foreign business transactions or opening accounts under wrong identity to camouflage transactions. For those preparation acts a possible fine up to 5.000 € can be imposed. It is important to note, that the fined person does not need not to be the tax evader. Finally, illegal trade with tax refunds (§373 AO) can be fined with 50.000€.

### **3.2 Involved Authorities, Investigation and Criminal Proceedings**

In general in case of criminal proceedings the prosecution authority is responsible for the investigation procedure of criminal offences (§§160, 161 StPO). Notwithstanding, in cases of pure tax offences the tax authorities are in charge of the investigation. Regularly, responsibility is only re-assigned to prosecutors if a) other non-tax-offences are connected or become revealed or b) a warrant of arrest has to be decreed. In addition, prosecutors are entitled to retract the investigation from tax authorities or to delegate back to them at any time. Within the tax authorities, professional tax crimes and fines departments take the lead of the investigation and tax crime investigators perform them. Starting point of the criminal proceedings is the opening of an investigation procedure. Such an investigation is mandatory if an authority gains knowledge of an offence. The investigation may have three possible outcomes: First, the authorities can decide to close the proceedings (§§386, 389 AO), second they can enact a penalty order (§§400, 407 StPO), and third if sufficient evidence is collected, the prosecutor can go to court and charge the suspect for tax evasion (§170 StPO).

A closure of the proceedings is chosen if the suspicions could not be approved. In case of weak evidence or minor severity the authorities are also entitled to offer a closure of the proceedings. In this case the closure is combined with a payment of the accused to avoid prosecution (§153a StPO). Penalty orders are also used to abbreviate the proceedings, and are possible for sentences

to penalties and for sentences up to one year of imprisonment. They are requested by the prosecutors and enacted by a judge. If a sentence per penalty order is accepted by the accused, no court trial will take place and the sentence becomes legally binding after two weeks. In cases of sufficient and severe evidence for tax evasion or if the accused rejects a sentence per penalty order, a court trial will take place.

The proceedings for misdemeanor remain under the competence of tax authorities. In contrast to criminal proceedings the authorities can decide discretionary whether they pursue an offence or not. The investigation procedure is organized similar to criminal investigations. Here, the completion of investigation may have the following results: First, tax authorities can close the investigation in case of insufficient proof. Second, even in case of probable cause tax authorities can close because of negligibility (regularly if the sum of evaded taxes is less than 1.533€ or the sum forged expense vouchers does not exceed 2.556€). Third, if evidence of criminal offence or connected criminal offences is secured, tax authorities may transfer the proceedings to the prosecution authorities. Fourth, in case of affirmation of the reproaches the tax authorities can impose a fine on the tax evader. If done so, the tax evader is entitled to submit an appeal within two weeks time. Then the department has to decide whether the reason of the appeal is accepted or not. If not, the procedure is transferred to the prosecution authority. If the prosecution authority decides to pursue the issue, it will be negotiated at a municipal court.

### **3.3 Amendments to the Criminal Tax Code**

Germany's general criminal tax code, the sixth chapter of the Abgabenordnung, remained relative constant after its predecessor, the Reichsabgabenordnung, was revised fundamentally and enacted as AO on 01. January 1969. Beside editorial revision since then only four changes seem relevant to be noted: First, in 1993 taxes and custom duties of the European Union (EU) fiscal code became taxes in the sense of the German criminal tax code. Second, in 2001 the maximum fine for evasion of withholding taxes was expanded from 5.000€ to 25.000€. Third, in 2002 the possibility to hand in amended returns was applied to tax evasion committed professionally or as an organized crime (§370a StGB). This change intends to support whistle-blowing in criminal organizations. As a result a person handing in amended returns can only be sentenced to half of the usual sentence (a maximum of 5 years instead of 10 years). Fourth, the Bundesgerichtshof, as the highest federal court below the federal constitutional court, decided in 2008 to establish minimum sentences for particular severities of tax evasion. Tax evasion of 100.000€ and above must be punished by prison sentences. In severe cases of more than one

million Euros of concealed taxes, no agreement between the state and the taxpayers outside the court can be concluded anymore.

From 1982-2002 the developments of case law due to decisions of the Finance Courts, especially the BFH, are collected by Peter Bilsdorfer (e.g. 2003): Basic principle of sentencing must be the individual extent of guilt and the amount of taxes evaded. Besides, conviction effects on the evader's status in society should be taken into account. The evader's actions after the commitment of the offence have to be considered. Hereby, disclaims of the evasion in defense at court cannot result in a severe sentencing. In contrast, sentencing should be milder if the evasion was stopped deliberately, encouraged by authority officials or police informers or if the proceedings are delayed by the actions of the prosecution authorities. Furthermore, for prison sentences to one up to two years, a general release on license should be generously considered and additional legal obligation to keep records like a business can be considered. While some norms have been interpreted more precisely, general amendments of the statute law were not made by the courts.

Finally, the administrative instructions for the crimes departments of tax authorities have undergone three important revisions. First published in 1983, new editions were enacted in 1991, 1995 and finally in 2004. Nevertheless, Part 6 of the instructions, which is dealing with the sentencing, remained the same, reflects the court decisions described above and binds the administration to them.

### **3.4 Developments in Sentencing Practice**

While statutory law has not changed dramatically during the last decades, sentencing practice reveals stronger changes of deterrence. Thus, we have a look at the development of long time-series of central indicators of sentencing practice.

Considering the developments of the overall number of sentences and fines imposed for tax evasion in criminal proceedings in long time-series (*Figure 3*), i.e. the number of cases that were actually prosecuted, the figures show peaks in severe punishment at the beginning of the 1980s as well as in the mid and late 1990s. The changes in the 1990s mainly result from offences in VAT, customs duties and excise duties (*Figure 4*), and thus reflect the change in the law in 1993. With regard to the punishment of minor and major offences, it seems evident that the number of cases with fines for minor tax offences decreased a lot more than the number of those with prison sentences or penalties for major tax offences.

**Figures 3 and 4 about here**

Since the beginning of the 1970s, a steadily increasing trend can be observed for the sum of nominal penalties imposed for tax evasion (*Figure 5*). For the sum of prison sentences (*Figure 6*), i.e. in more serious cases of tax evasion, there is a decline which is first observable in the beginning of the 1980s and which became steeper during the end of the 1980s. When offences in cases of indirect taxation are excluded, the figures show a steady increase. This could of course reflect the fact that the extent of tax evasion and the shadow economy has increased over time as well. But taking these figures together with those shown in *Figures 3 and 4*, it becomes clear that the lower number of offences punished with prison and fines was more than weighed up by more severe sentences (higher fines and longer imprisonment).

**Figures 5 and 6 about here**

**3.5 Amendments at the recent margin: The “Black Activities’ Act”**

In 2004 the “Law to intensify the fight against black activities and accompanying tax evasion” (SchwarzArbG, Bundesrats-Drucksache 155/04a) passed legislation to intensify deterrence. This law has provided for a uniform framework to investigate and sanction undeclared work and the shadow economy. It linked several different legal aspects of undeclared work from tax laws regarding tax evasion and fraud to social security or social assistance regarding social benefit fraud. Moreover, it mainly comprises of paragraphs which punish acts of concealment rather than acts of evasion and focuses on employers. Misdemeanors for offences against declarations and duties which favor ostensible self-employment are defined and fined up to 300.000 € by law. A fine for resistance against or neglect of audit duties up to 50.000 € is enacted and illegal employment of foreigners can be sentenced by penalty or prison from one up to six years depending on the severity of the offence and circumstances.

**4 Detection by Tax Auditing and Investigations**

While in the U.S., the differentiation between auditing and investigation is not common, in Germany a difference is made between regular auditing without suspicions of tax evasion and precise investigations in case of suspicions. Contrary to punishment, the intensity of control cannot easily be inferred from the statistics. *Figure 7* contains information on the average number of firms per auditor. The figures reveal that tax auditors have had to audit more and more firms on average since the beginning of the 1990s. This results in a decreasing probability

of detection. However, this trend stopped at the end of the 1990s, due to the allocation of more and more customs officials to the investigation of undeclared work as indicated by *Figure 8*. The number of tax investigations thus considerably increased in the end of the 1990s.

### **Figures 7 and 8 about here**

The “*Black Activities Act*” put this practice on a new legal basis. The financial control unit for undeclared work (Finanzkontrolle Schwarzarbeit, FKS) as part of the customs regularly informs about its activities. These statistics are presented in *Table 2* revealing an increased intensity of control at the individual level across time while the control intensity of employers decreased. The number of concluded investigations first went up until 2007 and then slightly decreased. Overall, the sum of penalties and fines in million Euros and the sum of prison sentences in years rose steadily indicating the considerable increase in deterrence the new law and the new investigation unit brought. The FKS mainly concentrates on professional forms of undeclared work, for example, in the construction sector where the phenomenon is not infrequently accompanied by illegal immigration. Thus, the statistics in *Table 2* also give a flavor as to how widespread undeclared work is in Germany. Overall, deterrence in Germany can be characterized as having increased mainly due to the *Black Activities Act*.

### **Table 2 about here**

Taking the two variables punishment and audit capabilities together, it becomes obvious that deterrence as the product of these two variables generally increased from the mid 1980s until recently in Germany. This leads us to state a second stylized fact regarding deterrence policy:

*Fact 2: Deterrence has increased in Germany from the mid 1980s until 2001.*

## **5 A Time Series Analysis**

As our two stylized facts indicate, there is first an increasing trend of the size of the shadow economy since the 1970s until the beginning of the new millennium and, second, deterrence has increased either though less steadily and from the mid 1980s only. This could imply first that the shadow economy increased despite deterrence efforts, second that increases in deterrence led to a crowding effect, as proposed by Frey (1997a), and thus increased the shadow economy, or third that increases in the shadow economy induced an increase in deterrence measures. In order to investigate these relationships, we propose to test Granger causality using the data of tax compliance and deterrence that are available as time series. As outlined above, the only measure

of tax compliance that is available on a time series basis is the size of the shadow economy as measured by the MIMIC cum currency demand approach (Schneider 2006). These data are available from 1970 until 2005. Deterrence is measured by four different variables. Penalties per investigation, prison sentences per investigation and fines per investigation are used as measures of punishment, while the number of firms per audit supposedly captures the probability of detection. Due to data availability problems, we have to restrict the period of analysis to the years 1974 to 2001. We could thus unfortunately not capture the turn in the trend of the German shadow economy. The results of our tests are reported in *Table 3*.

### **Table 3 about here**

The results of the Granger causality tests are at best mixed. Only two times can the null hypothesis that no causal relationship exists be rejected at the 5 percent significance level. Both results are contradicting each other, however. First, the hypothesis that penalties per investigation do not Granger-cause the shadow economy cannot be rejected on any conventional significance level, while the hypothesis that the shadow economy does not Granger-cause penalties per investigation is rejected at the 5 percent level. Prison sentences per investigation and the shadow economy are not Granger-causing each other according to our results. However, in the case of fines per investigations, the hypothesis that they do not Granger-cause the shadow economy can be rejected at the 5 percent significance level, while the reverse causality is not supported by the test statistics. Finally, firms per audit and the shadow economy are not causing each other according to the test statistics. Thus, there is one precedence relationship from the shadow economy to penalties per investigation and another from fines per investigation to the shadow economy. Moreover, it should be noted that the time series of fines per investigation follow a more cyclical pattern with local maxima in 1980, 1986, 1997 and 1999.

In sum, these results imply that the impact of punishment measures on the size of the shadow economy is ambiguous while the probability of detection as measured by the number of firms per audit does not have any impact on the size of the shadow economy. Unfortunately, our data set does not cover the turning trend in the shadow economy numbers, nor are data on the number of investigations available for a longer time period than the 1990s. We can thus only present this evidence as preliminary.

## **6 Conclusion**

In this paper, we have investigated whether tax compliance as measured by the size of the

shadow economy, undeclared work or tax morale is actually negatively affected by deterrence as supposed in the seminal analysis of Allingham and Sandmo (1972) and a lot of the follow-up literature as in practice as well. The unique descriptive data presented in this paper indicate that the size of the shadow economy follows a steadily increasing trend from the beginning of the 1970s until the beginning of the new millennium and drops afterwards. Similar inferences can be drawn from survey data on undeclared work or tax morale though no continuous time series are available. The more diverse picture of deterrence in Germany since the beginning of the 1970s also allows for the conclusion that deterrence has increased in Germany from the mid-1980s to the beginning of the new millennium. With two steadily increasing time series, simple OLS regressions are not useful. With Granger causality tests, we find that the shadow economy Granger-causes penalties per investigation, while fines per investigation Granger-cause the shadow economy. Investigation in terms of number of firms per auditor does not have any impact on the shadow economy.

In a further step with first simple OLS regressions (not reported here), no significant effect of deterrence on the size of the shadow economy could be found. Our analysis has an additional drawback: the data period for the more systematic analysis only covers the years 1974 to 2001 such that the most interesting turning point in the trend of the shadow economy may not be captured sufficiently by the data yet due to time lag properties. Nevertheless, our analysis casts some doubts as to the usefulness of a pure deterrence policy to fight the shadow economy.

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## Tables

**Table 1: The size of the shadow economy and the extent of undeclared work in Germany (relative to official GDP) according to different methods and definitions**

<b>Methods and sources</b>	1970	1975	1980	1990	2000	2001	2003	2004	2005	2006	2007
<b>Survey</b>											
IfD Allensbach (1975)	–	3.6	–	–	–	–	–	–	–	–	–
Lamnek et al. (2000) <sup>1)</sup>	–	–	–	–	29/16	–	–	–	–	–	–
Mummert and Schneider (2001) <sup>2)</sup>	–	–	–	–	25/13	–	–	–	–	–	–
Feld and Larsen (2010) <sup>3)</sup>	–	–	–	–	–	4.1	–	3.1	3.6	1.8	3.2
West Germany	–	–	–	–	–	4.1	–	2.8	3.2	1.8	2.8
East Germany	–	–	–	–	–	4.3	–	4.4	4.8	2.5	4.4
Enste et al. (2009) <sup>4)</sup>	–	–	–	–	–	–	–	–	–	6-7	–
<b>Income Gap<sup>5)</sup></b>											
Lippert and Walker (1997)	11.0	10.2	13.4	–	–	–	–	–	–	–	–
<b>Physical Input</b>											
Schneider and Enste (2000) <sup>6)</sup>	–	–	–	14.6	–	–	–	–	–	–	–
<b>Transactions Approach</b>											
Schneider and Enste (2000) <sup>7)</sup>	17.2	22.3	29.3	–	–	–	–	–	–	–	–
<b>Currency Demand</b>											
Kirchgässner (1983)	3.1	6.0	10.3	–	–	–	–	–	–	–	–
Langfeldt (1984a, 1984b)	12.1	11.8	12.6	–	–	–	–	–	–	–	–
Schneider and Enste (2000) <sup>8)</sup>	4.5	7.8	9.2	11.8	14.7	–	–	–	–	–	–
<b>Hidden Variable Approach<sup>9)</sup></b>											
Frey and Weck-Hanneman (1984)	5.8	6.1	8.2	–	–	–	–	–	–	–	–
Pickhardt and Sardà Pons (2006)	–	–	9.4	11.4	16.3	–	–	–	–	–	–
Schneider (2010)	4.2	5.8	10.8	12.2	16.0	16.0	17.1	16.1	15.4	15.0	14.7
<b>Soft modeling</b>											
Weck (1983)	–	8.3	–	–	–	–	–	–	–	–	–

Notes: 1970-2000: <sup>1)</sup> Refers to 1997; 18 years and older. <sup>2)</sup> Refers to 1998; 14 years and older. Proportion of the interviewed which has ever carried out undeclared work. <sup>3)</sup> The shadow economy (“Schwarzarbeit”) relative to official GDP calculated on the basis of hours worked by the 18-66-year-olds and the wages pertaining in the official economy. Data for 2001 were first published in Pedersen (2003). <sup>4)</sup> The shadow economy (“Schwarzarbeit”) relative to official GDP calculated on the basis of hours worked and the wages pertaining in the official economy. 18 years and older. <sup>5)</sup> Discrepancy between expenditure and income. <sup>6)</sup> Physical input: electricity consumption. Refer to work by Mariá Lackó. <sup>7)</sup> Refer to work by Edgar L. Feige. <sup>8)</sup> Refer to work by Vito Tanzi. <sup>9)</sup> (DY)MIMIC estimates, a combination of the currency demand approach and the Multiple Indicators Multiple Causes (MIMIC) method.

Sources: Feld and Larsen (2010).

**Table 2. Results of the work of the federal financial investigation unit (Finanzkontrolle Schwarzarbeit FKS), 2005 – 2008**

	2005	2006	2007	2008
Controls of individuals at the workplace	355,876	423,175	477,035	488,996
Control of employers	78,316	83,258	62,256	46,058
Concluded investigations in criminal proceedings	81,290	91,820	117,441	106,960
Concluded investigations of misdemeanors	53,852	54,087	72,969	63,274
Sum of penalties in million Euros	67.1	46.4	51.9	56.7
Sum of damages according to investigations in criminal proceedings by FKS in million Euros	562.8 <sup>1</sup>	603.6	561.8	549.7
Sum of damages according to investigations in criminal proceedings by tax investigators of the Laender induced by intelligence of the FKS in million Euros <sup>2</sup>			37.0	39.1
Sum of fines in million Euros	21.2	19.8	25.4	33.9
Sum of prison sentences in years	995	1,123	1,398	1,556

<sup>1</sup> 37 Million Euro of it by special commissions

<sup>2</sup> in 2005 and 2006 not separately recorded.

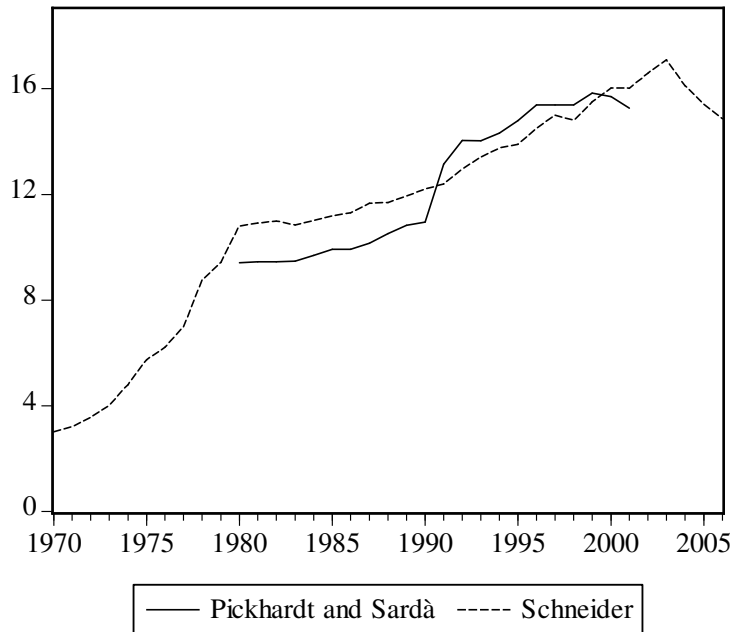
Source: BMF (2009), Entwicklung der Bekämpfung der Schwarzarbeit und der illegalen Beschäftigung, 11. Bericht der Bundesregierung, Monatsbericht, September 2009, p. 68.

**Table 3 Tests of Granger Causality for Deterrence and the Size of the Shadow Economy, Germany, 1974 – 2001, 4 lags**

y	x	F (y ← x)	F (y → x)
Shadow Economy	Penalties per Investigation	1.047	4.027**
Shadow Economy	Prison Sentences per Investigation	1.156	0.555
Shadow Economy	Fines per Investigation	3.359**	0.501
Shadow Economy	Firms per Auditor	1.207	1.374

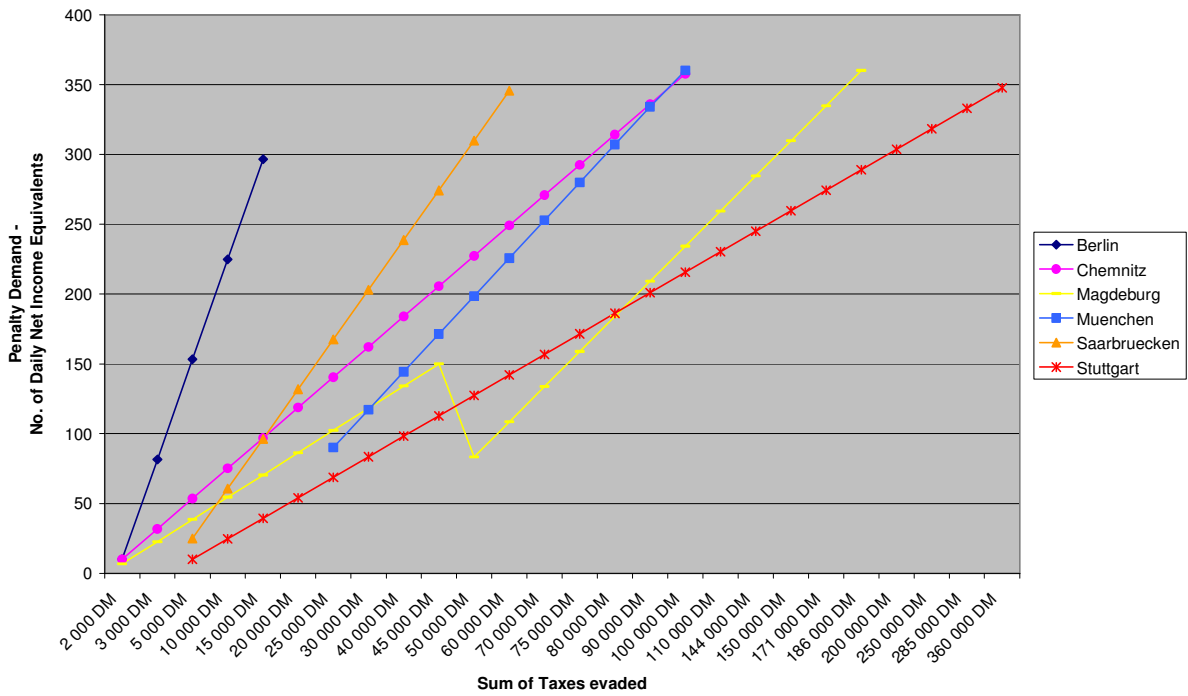
‘\*\*\*’, ‘\*\*’, ‘\*’ or ‘(\*)’ indicate that the null hypothesis of no causal relationship can be rejected at the 0.1, 1, 5, or 10 percent level, respectively.

**Figures**

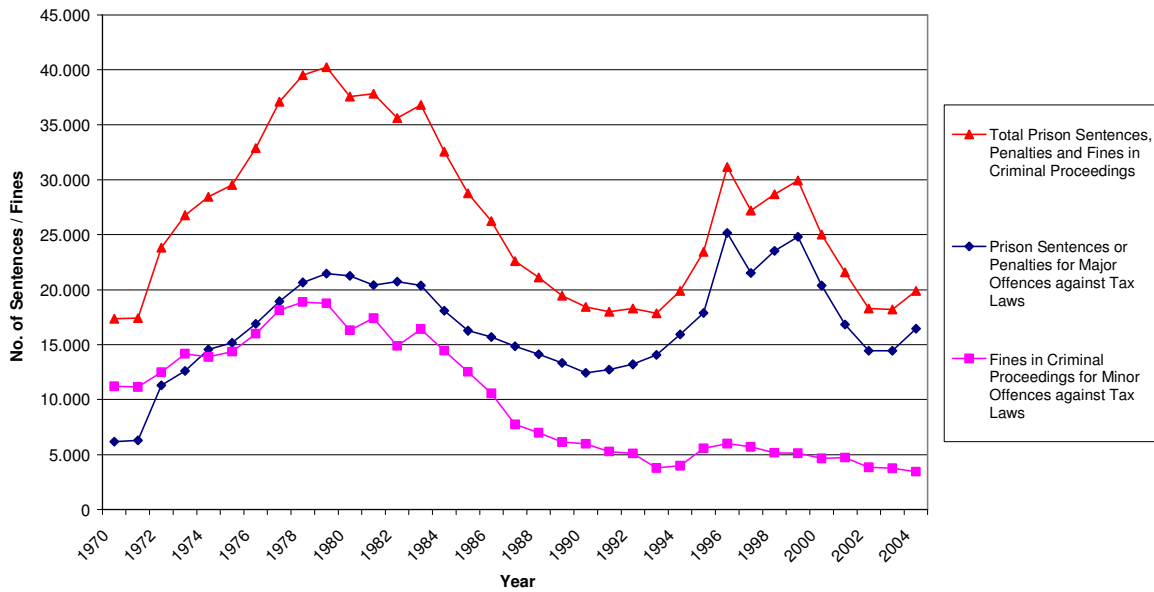


**Figure 1** The Size of the German Shadow Economy, 1970 to 2006 (in Percent of the Official Economy)

Source: Pickhardt and Sardà (2006) and Schneider (2006)

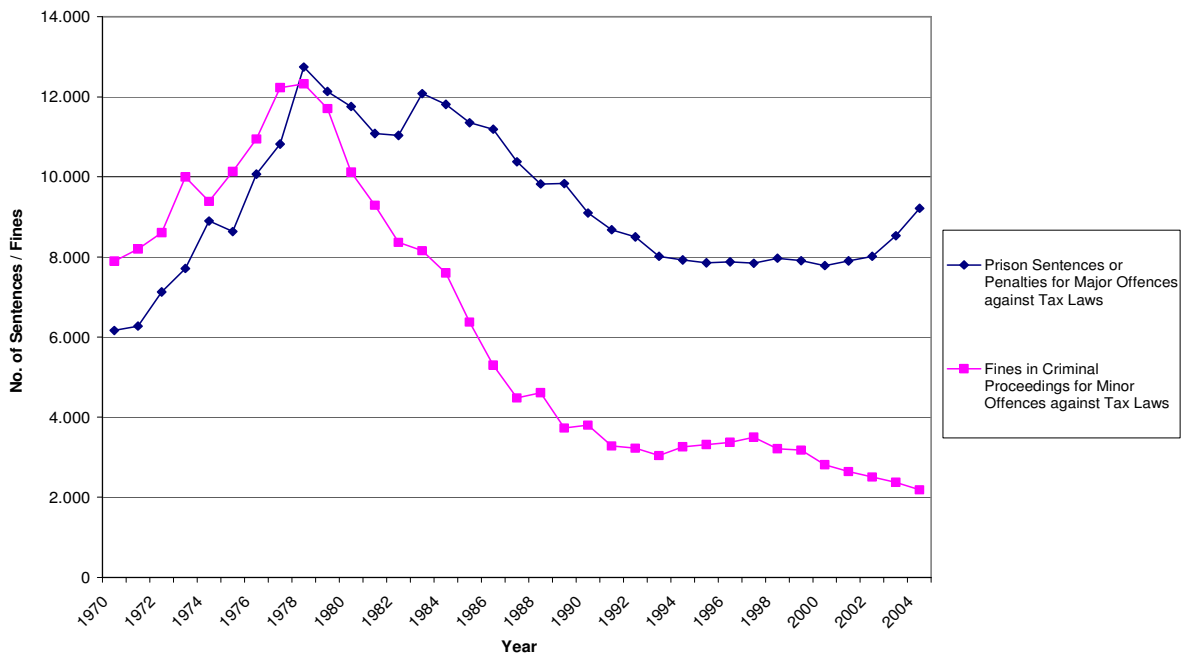


**Figure 2** Penalty Demands for Tax Evasion Acc. to Administrative Instruction Tables of Different Regional Tax Offices (Source: INF. Informationen fuer Steuern und Wirtschaft, 1998, 11, pp. Vf., own calculations.)



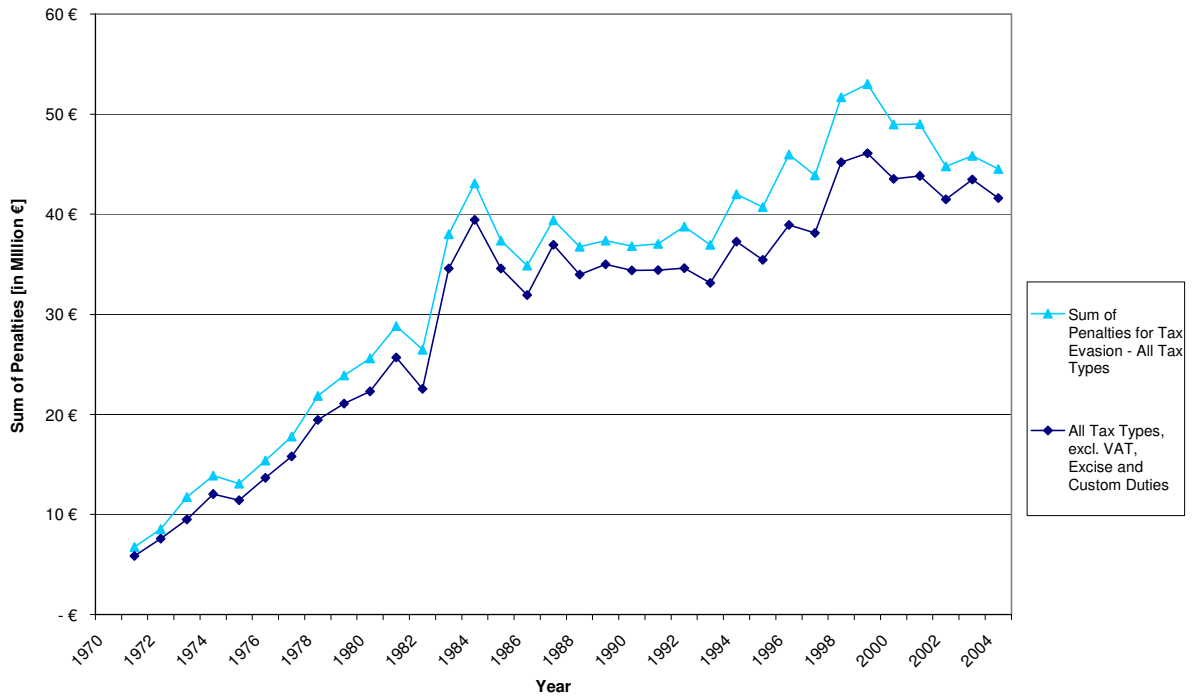
**Figure 3** Sentences and Fines in Criminal Proceedings for Tax Evasion (All Tax Types)

Source: German Tax Offences Statistic, BMF (1970-2005).



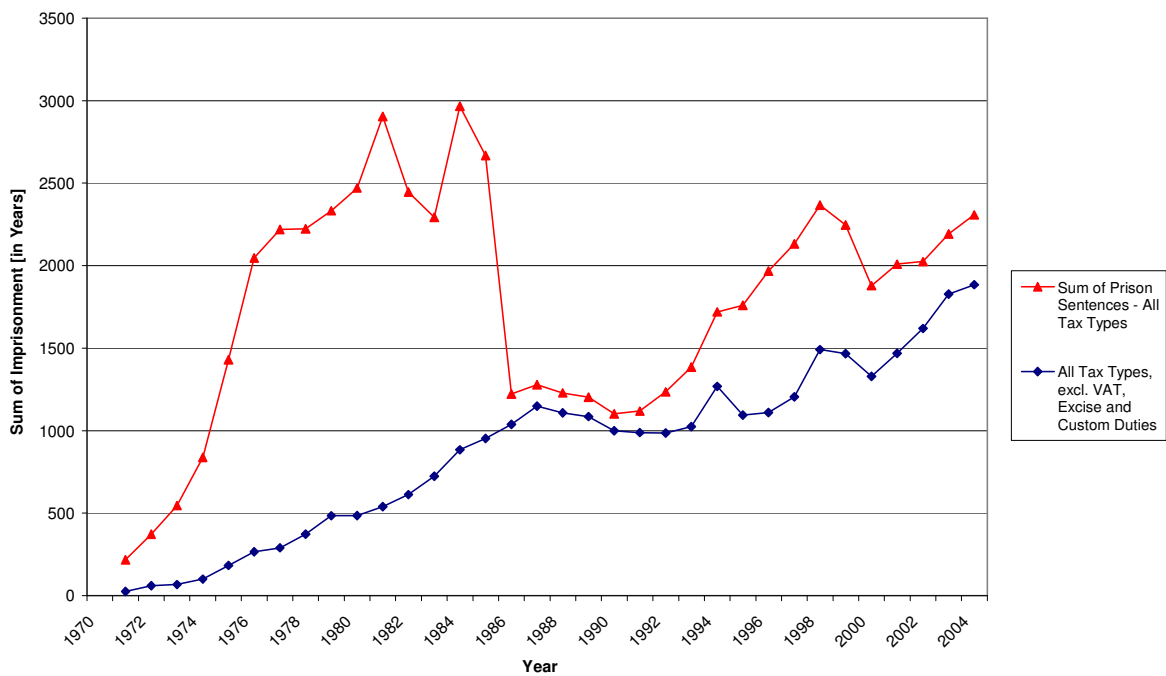
**Figure 4** Sentences and Fines in Criminal Proceedings for Tax Evasion (Excluding VAT, Excise and Custom Duties)

Source: German Tax Offences Statistic, BMF (1970-2005).



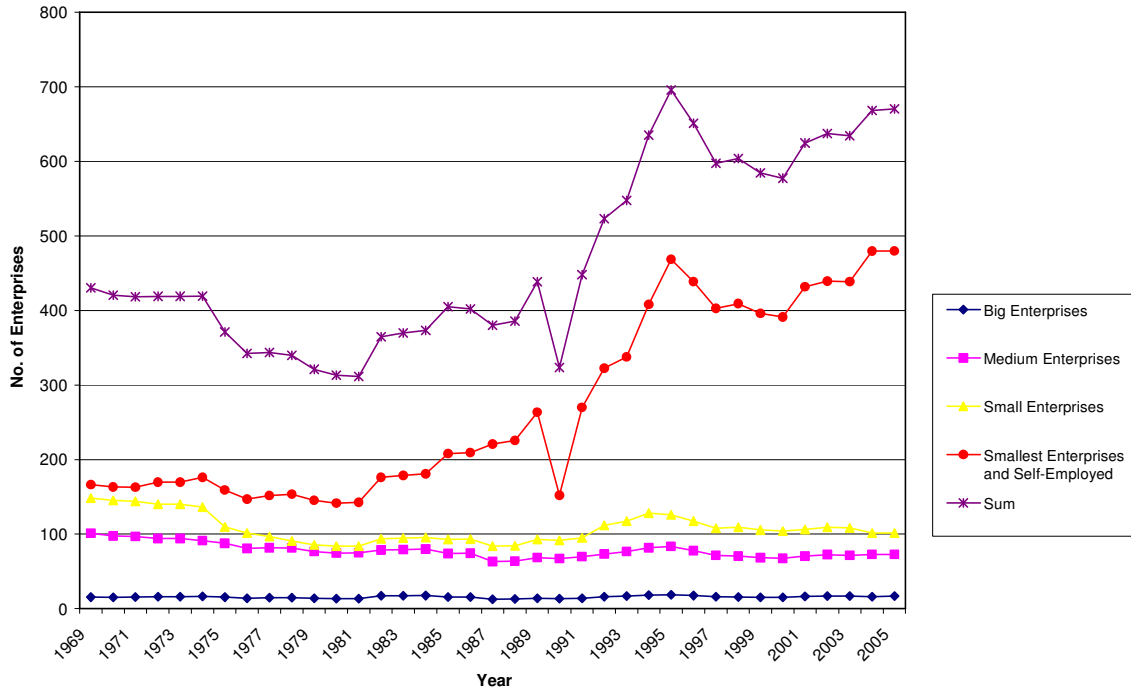
**Figure 5** Sum of Penalties Imposed for Tax Evasion (all Tax Types, and excluding VAT, Customs and Excise Duties)

Source: German Tax Offences Statistic, BMF (1970-2005).

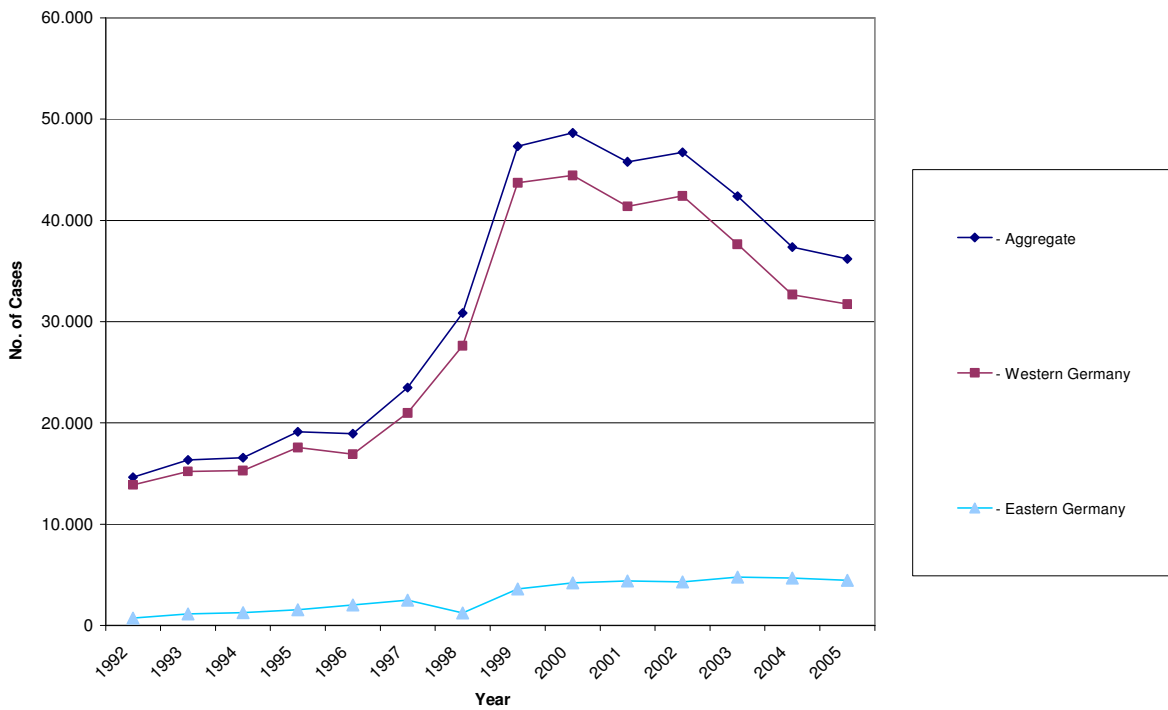


**Figure 6** Sum of Prison Sentences (all Tax Types, and excluding VAT, Customs and Excise Duties)

Source: German Tax Offences Statistic, BMF (1970-2005).



**Figure 7** Audit Capabilities (On-Site-Inspections)  
Average No. of Enterprises per Auditor  
Source: German Tax Audits Statistic, BMF (1970-2005).



**Figure 8** Tax Investigations and Administrative Assistance of Tax Investigators  
- Eastern, Western Germany and Aggregate -

Source: German Tax Investigation Statistic, BMF (1970-2005).

## Notes

- <sup>(\*)</sup> Lars P. Feld gratefully acknowledges a grant from the German Science Foundation (DFG SPP 1142).
- <sup>1</sup> Veit (1927) and Schmolders (1932) already argued that tax compliance is shaped by the relationship between citizens as taxpayers and the state. See Schöbel (2005).
- <sup>2</sup> See FORES (1977, 1987, 1997). Additionally two studies about the taxpayers' reactions in small and medium sized companies were conducted (FORES 1963, 1982). Another study about tax simplification completes their efforts (1994).
- <sup>3</sup> By definition, in the U.S., misdemeanors are punished by fines, penalties or less than a year of imprisonment. In Germany only tax crimes can be punished by penalties and imprisonment.
- <sup>4</sup> Furthermore the breach of import and export ban (§372 AO), organized contraband crime (§373 AO) and fence with contraband or non-taxed goods (§374 AO) are liable to prosecution.