

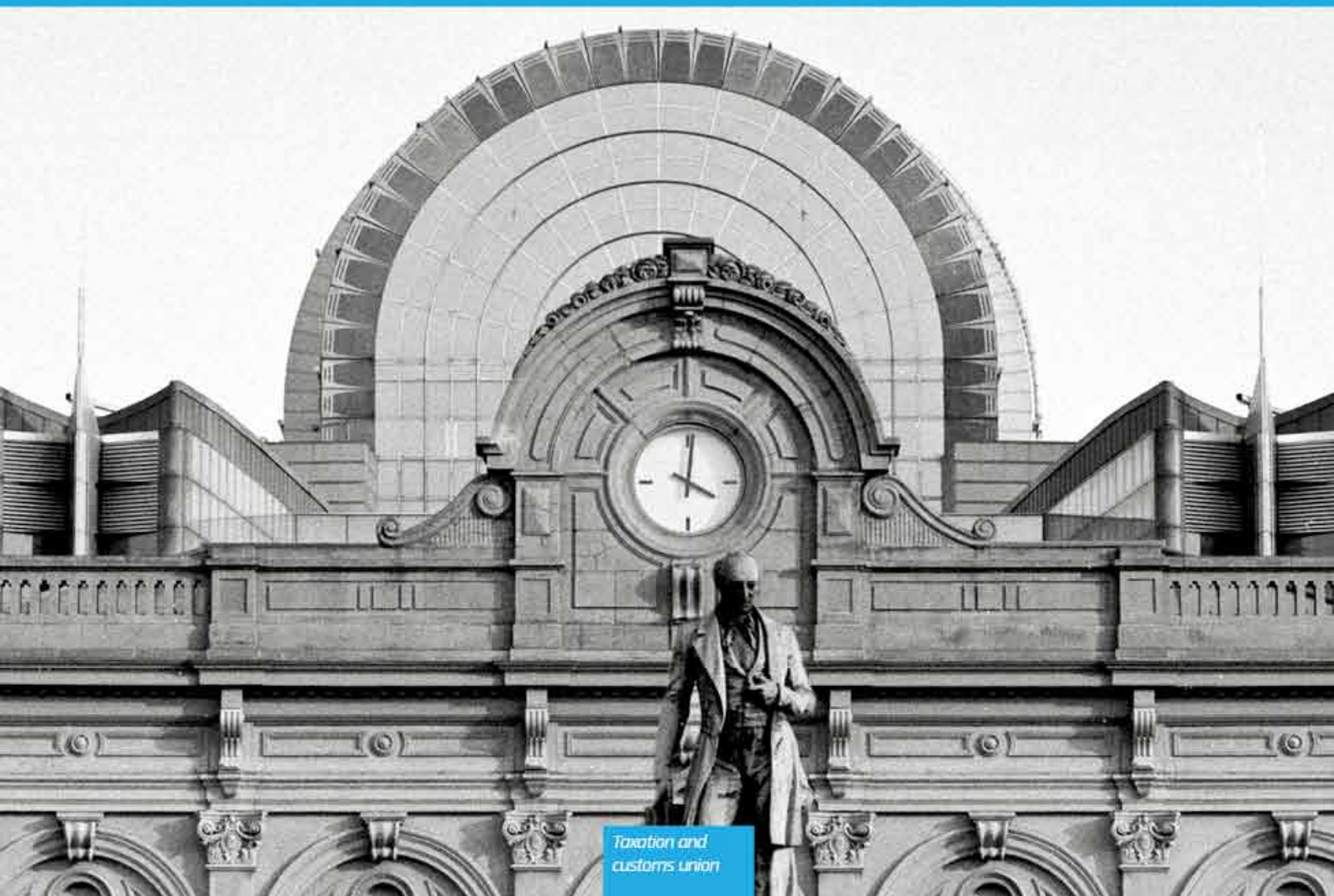


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Behavioural Economics and Taxation



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Abstract

Most traditional tax policies have been based on classical economic models of tax payers as decision makers. As in many fields where humans make decision, however, more integrated behavioural economic models, that is, models that take into account both psychological and purely economic factors can provide further insights. Therefore, a large literature in the field on the behavioural economics of taxation exists. This report summarizes central parts of this literature, reviewing mainly experimental and observational studies in the academic literature to be informative for policy-makers. It also provides a potential agenda for future research and application of behavioural economic policies with regard to tax compliance.

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1. Introduction

In the light of the current economic, banking and public debt crises, many European countries are rethinking the funding of public services. Taxes are usually the main source of income to finance publicly provided goods and services. Thus, tax compliance directly impacts a country's ability to provide public goods, such as roads, schools, public health services and administration.

This paper contributes to this debate by surveying the existing literature on tax compliance, with a focus on the insights from behavioural economics. It also draws first policy conclusions and provides a research agenda in the field of behavioural economics with the objective of an improved understanding of the driving factors behind tax compliance. The current research suggests that policy makers should consider behavioural economic policies in practice, for example, the potential of moral suasion in high-compliant countries, the use of the probability perceptions of tax payers (e.g., when taking part in lotteries), or ensuring that taxes serve a public benefit and that tax payers are aware of this fact. Policy makers should at the same time also remember that behavioural economic policies have to be used cautiously, for example due to differences in culture. Furthermore, current research needs to be extended to gain more insights into the interplay of cultural or social norms and tax compliance, effects of behavioural economic policies when com-

pliance levels are already low, and network and feedback effects of audits. Finally, more field experiments are necessary to be able to extrapolate findings observed in laboratories into practice. We hope that this survey can be a first step towards addressing such research and policy agendas.

To systematically approach the field of tax compliance, it may be useful to define the term. However, there is no common definition of what precisely is compliant behaviour. Typically, tax compliance is rather defined simply as the absence of tax evasion. Tax evasion again has to be differentiated from tax avoidance. The OECD defines the term tax evasion as 'illegal arrangements where liability to tax is hidden or ignored'. This contrasts tax avoidance, which is described as an 'arrangement of a taxpayer's affairs that is intended to reduce his liability and that although the arrangement could be strictly legal it is usually in contradiction with the intent of the law it purports to follow'.¹ Similarly, Sandmo (2005, p. 645) defines: 'Tax evasion is a violation of the law: When the taxpayer refrains from reporting income from labour or capital which is in principle taxable, he engages in an illegal activity that makes him liable to administrative or legal action from the authorities.' Hence,

1. The definitions are taken from the OECD Centre for Tax Policy and Administration's *Glossary of Tax Terms*. Available at: <http://www.oecd.org/ctp/glossaryoftaxterms.htm>.

tax evasion is illegal, while tax avoidance is (strictly speaking) legal and would therefore be considered as tax compliance. Although this formal definition makes it straightforward to distinguish compliance from non-compliance, moral judgement might also evaluate tax avoidance as inappropriate—potentially even more than some cases of non-compliance. Hence, behavioural economic policies targeting this moral element may also have a positive impact on tax payments beyond the merely legal realms of tax evasion.

As tax evasion is illegal activity, estimating its precise magnitude poses difficulties; however, some attempts to do so exist. The UK's HM Revenue & Customs provides every year an estimation of the UK tax gap.² The tax gap is defined as the difference between the estimated theoretical tax liabilities and the actual tax revenue. *Figure 1* shows a recent estimation for the years 2010 to 2011. The total net tax gap accounts to about EUR 37 billion (GBP 32 billion, around 2% of GDP) which compares to 6.7% of the estimated theoretical tax revenue. Losses from income tax, national insurance contribution and capital gains tax, as well as losses from the value added tax are with 45% and 30% respectively, the two largest components (HM Revenue & Customs 2012, p. 7). Losses from tax evasion are estimated to EUR 4.6 billion (GBP 4 billion, around 0.3% of GDP) and losses from avoidance to EUR 5.8 billion (GBP 5 billion, around 0.4% of GDP).

2. Here the UK serves as an example because from the EU28 countries Denmark and the UK are the only Member States that publish estimates of the tax gaps on a periodic basis. Other reliable data on the tax gap is currently not available.

Other factors that expand the tax gap are for example errors, non-payment, differing legal interpretations, criminal attacks and the hidden economy (HM Revenue & Customs 2012, p.7).

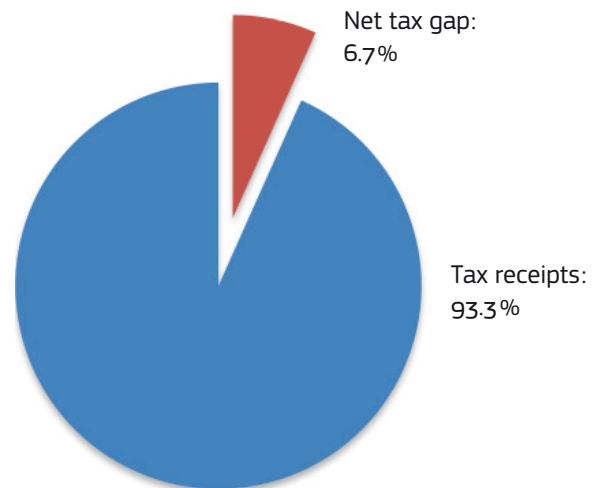


Figure 1: The estimated tax gap in the UK for the years 2010 to 2011 in percent of the estimated theoretical tax revenue. Source: HM Revenue & Customs (2012, p. 6).

The issue of tax compliance is complex, not least as numerous taxes and various kinds of taxpayers are involved. Economic studies of tax compliance predominantly investigate individual income taxes (Alm 2012, p. 53), which self-employed or workers whose income is not directly taxed at the source can evade by understating their true income. Furthermore, for income taxes there is the potential problem of overstated deductibles. Firms can evade taxes by not paying corporate income taxes; however, in such cases detection is likely as companies are audited more frequently than individuals. Sales taxes, retail sales taxes, value-added taxes and property taxes in turn can be evaded by both, firms and individuals, but often require some kind of mutual agreement on tax evasion (Alm 2012). Over-

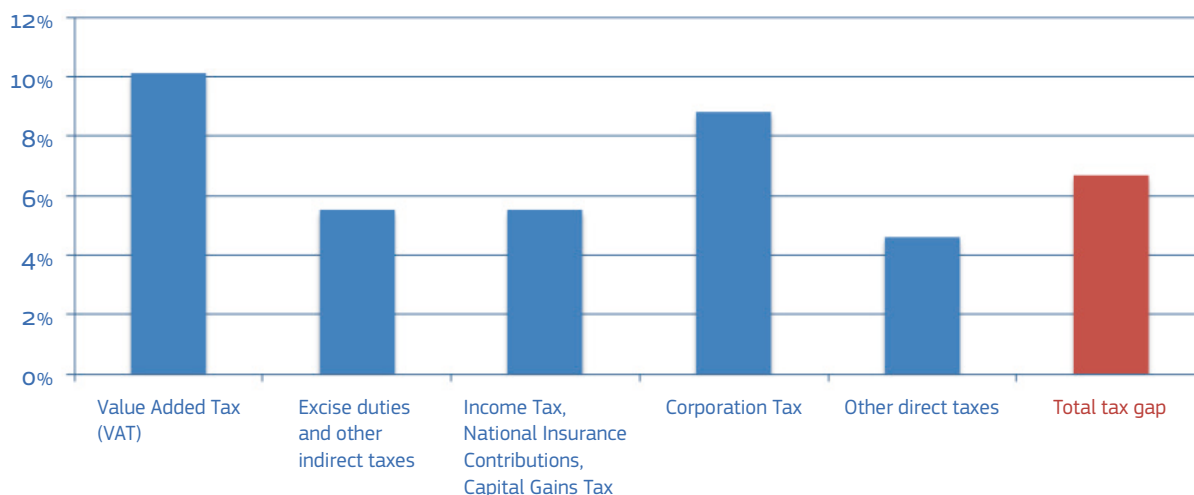


Figure 2: Estimated tax gaps in the UK.

Source: HM Revenue & Customs (2012).

all, this makes it difficult to assess the share of the different taxes in the overall tax gap and consequently publications on this matter are rare. So far, only the annual tax reports of Denmark and the UK break down the tax gap to the different taxes on a regular basis. *Figure 2* shows the estimated shares of the UK tax gap for different types of taxes. Again, the tax gaps are defined as the amount of evaded and avoided tax. The largest tax gaps occur for the value added tax and the corporation tax.

Despite measurement difficulties tax compliance appears to be an intensively researched field in economics, underlying its importance for policy. The relatively large body of literature on neoclassical models of tax compliance is surveyed by Andreoni *et al.* (1998). Recent literature applies findings from the emerging field of behavioural economics to tax compliance. Hashimzade *et al.* (2012) give a comprehensive account of behavioural economic tax compliance models. The following sections build on this survey and

provide an introduction to the field, summarising the measurement problems, traditional tax compliance models and then presenting literature on social interaction and tax compliance. A particular focus in this literature survey is put on experimental studies on tax compliance, as these have the advantage of overcoming classical measurement problems, while being able to model economic incentives in a straightforward way. Doing so, this document focusses on tax compliance of individuals, giving only a brief discussion of the topic of tax compliance by companies. In the end the survey also includes a short outlook of how policy makers can use existing research, for example by using moral suasion in tax collection. It also points to some topics for further research that may be particularly useful for practical application, including further cross-cultural studies, research on increasing compliance when widespread tax evasion is already prevalent, and more field experiments (hence research at the interplay of researchers and administrations).

2 . Measuring tax evasion

Several articles (for example Slemrod and Yitzhaki 2002; Alm 2012; Slemrod and Weber 2012) discuss traditional and more recent approaches to measure tax evasion and its limitations. The central problem is that the criminal nature of tax evasion and threat of punishment cause cheaters to hide their actions. Therefore, tax evasion is generally not

easily observable and hard to measure. Economists have used a number of methods to circumvent this problem. *Table 1* lists the most common approaches and summarises advantages and shortcomings. The first two methods measure tax evasion indirectly, the last four methods allow for a direct measurement of tax evasion.

Method	Advantages and disadvantages
Estimations using shadow economy data	Activity in the (unobserved) shadow economy are not taxed or regulated. Estimates of the size of the shadow economy can be used to calculate evaded taxes (Schneider 2005), for example using the currency demand approach. However, estimations are likely to be unreliable because they use estimates of the unobserved factors which are hidden and therefore estimations suffer from serious measurement problems. Another practical problem is the fact that these approaches assume the velocity of money to be constant (over time and between the official and the unofficial economy).
Consumption-based estimations	The commonly observed overconsumption of self-employed individuals compared to employees can be used to estimate tax evasion. A classic example is included in Pissarides and Weber (1989) who use British food survey data. Recently, Artavanis <i>et al.</i> (2012) used consumer loan data from a major Greek bank to estimate the households' real income. The advantage of this method is that it uses observable factors which are very strongly correlated with true (but unobservable) income.

Table 1: *Different methods to measure tax evasion.*

Method	Advantages and disadvantages
Surveys	Surveys of tax morale and evasion frequently draw on data from the World Value Survey (WVS) or the European Value Survey (EVS) (e.g., Frey and Torgler 2007; Lago-Peñas and Lago-Peñas 2010). The EVS includes a question on people's tendency to justify cheating on tax payments if they have the opportunity to do so. Self-reported tax morale is argued to be correlated with tax compliance. An advantage of survey data is its wide availability for many countries, allowing for cross-cultural analyses. Furthermore, also inner-country analysis can be conducted if regional data is available (as in Feld and Larsen 2012). Drawbacks of studies using surveys are that self-reported attitudes towards evasion might be biased as people may not report honestly on dishonest or illegal behaviour. Furthermore, biases are potentially influenced by culture, rendering intercultural comparisons difficult.
Randomised tax audits	Randomised tax audits provide a more accurate and direct measure of individual compliance. They are, however, very costly and the data is only available for very few countries. Furthermore, even a thorough audit may not detect evasion with certainty. Evidence from the randomised audits is used for example in the study of Schneider (2005).
Lab experiments³	Alm (2012) and Torgler (2002; 2007) discuss arguments in favour and against using laboratory experiments in research on tax compliance. Clear advantages are that compliance is directly measurable, institutional changes are easily testable, it is easier to investigate the causality of effects. Also cultural influences on tax compliance may be identified in cross-cultural studies. On the other hand, the lacking realism of lab experiments can be criticised (for example harsh punishment of

Table 1 (cont.)

3. Levitt and List (2007) provide a general discussion on the validity of experimental methods in economic research.

Method	Advantages and disadvantages
Lab experiments <i>(cont.)</i>	evasion like jail sentences and ostracism of evaders cannot be implemented in the lab) which can lead to reduced external validity. Furthermore, the use of student subjects, as common in experimental economic research, may be problematic because they have little experience with filing tax reports and have a higher education than the average taxpayer.
Field experiments	Compared to laboratory experiments, field studies ensure a high external validity of the results. Like in laboratory experiments, institutional changes can be implemented. A drawback to field experiments is that their implementation appears relatively difficult, as they are costly and time consuming. For example, randomised audits can be used in order to make tax compliance measurable. However, the implementation of randomised audits can be very costly. Examples of field experiments are Slemrod <i>et al.</i> (2001), Kleven <i>et al.</i> (2011).

Table 1 *(cont.)*

An example for a consumption-based estimation approach for measuring the shadow economy and tax evasion is Artavanis *et al.* (2012). They use a dataset on credit recipients from a major Greek bank. The authors find a vast over-consumption of consumer loans in some occupations. The average self-employed borrower spends more than 80% of the declared monthly income on servicing their debt. Some professions spend even more than 100% of the declared monthly income on paying back their bank loans (Artavanis *et al.* 2012, p. 2). Following the bank's common practice, the authors estimate the true income of self-employed individuals.

The authors find that the average self-employed earned 1.92 times the income reported to the tax authority. Consequently, the authors estimate the total tax loss from evasion of self-employed in Greece at EUR 11.2 billion in 2009 (Artavanis *et al.* 2012, p. 21). The strength of this study is surely the unique micro dataset, which accounts for numerous socio-economic variables on a household level and allows for precise estimation of income tax evasion. However, the overall tax compliance even of the individuals investigated in this study, for example considering other taxes, is not accounted for.

3. Traditional models of taxation

The influential article by Allingham and Sandmo (1972) introduces the most commonly used framework to analyse income tax evasion as a risky choice, drawing from the literature on economics of crime, as well as on optimal portfolio choice (Allingham and Sandmo 1972, p. 323). In the model it is assumed that taxpayers are homogeneous and act rationally, money maximising and selfish. Taxpayers can either choose a safe portfolio (truthfully declaring their gross income and paying the full tax liability), or a risky portfolio (evading taxes by under-reporting their gross income). The taxpayers' income cannot be observed by the tax authority unless a tax audit is conducted. Yitzhaki (1974) introduces changes to the Allingham-Sandmo (A-S) model in order to make it more realistic. The penalty of an uncovered tax evader is now calculated as a share of the evaded tax, rather than a levy on undeclared income. The author argues that this is more in line with the American and Israeli tax systems (Yitzhaki 1974, p. 201).

The augmented framework allows for analysing the effects of changes in the probability of being detected, the fine rate and the tax rate. *Table 2* illustrates that a rising probability of being detected and an increasing fine rate reduce the expected payoff from evading taxes, and thus make cheating relatively less attractive. For a change in the tax rate the predictions are somewhat counter-intuitive, as a higher tax rate leads to higher tax compliance.

Additionally the standard A-S model has further been extended by including more realistic elements; while keeping the rational expected-utility framework, for example an additional (potentially moral) cost of evasion has been integrated in the framework. Andreoni *et al.* (1998) discusses some extensions. Furthermore, also a dynamic version has been studied by Engel and Hines (1999).

Variable	Prediction
Audit probability	Positive correlation with compliance: The higher audit probability decreases the expected payoff from tax evasion.

Table 2: Predictions of the Allingham-Sandmo-Yitzhaki model of tax compliance.

Variable	Prediction
Fine rate	Positive correlation with compliance: the higher fine rate decreases the expected payoff from tax evasion.
Tax rate	Positive correlation with compliance for the assumption of decreasing absolute risk aversion: for a taxpayer with decreasing absolute risk aversion, a higher tax rate cuts the safe net income for the case of compliance. Thus, the taxpayer is less willing to take the risk and the tax compliance increases.
Gross income	Negative correlation with compliance for the assumption of decreasing absolute risk aversion.

Table 2 (*cont.*)

The benefits of the model are its straightforward assumptions and its relatively simple and clear predictions. However, the framework also includes the usual limitations of economic models, which abstract from the complex reality that make tax compliance a difficult topic. For example, uncertainties about the real probability of an audit or severe punishments, like imprisonment, are not included in the model. In a comprehensive survey Alm *et al.* (1992b) discuss both strengths of the standard A-S model as well as additional aspects to consider. Apart from this, the model has been criticised in several ways (Hashimzade *et al.* 2012, p. 2):

- Using realistic fine rates, tax rates, audit probabilities and coefficients of risk aversion, the model suggests complete tax evasion.
- Empirical studies have shown that tax evasion increases with a rising tax rate, rather than fall (Slemrod and Yitzhaki 2002, p. 1441).
- The assumption that all income is self-reported to the tax authority is not realistic. Firms often directly report their workers' wages to the tax authority (Sandmo 2005, p. 646).
- The probability of facing an audit is not common knowledge, and ambiguity-averse taxpayers might overestimate the probability of an audit (Snow and Warren 2005, p. 869)
- The framework simplifies the behaviour of economic agents. It does not take psychological effects and moral consideration well into account (Bosco and Mitton 1997, p. 299).
- It has been argued that the use of expected utility, exogenous income and labour sup-

ply, full information (e.g. absolute audit probability), and the framing as a 'game against nature' is unrealistic (Bosco and Mittone 1997 p. 299). The exclusion of important psychological effects, for example perceived injustice or inequality in the tax system, social norms, and public good implications, can be criticised.

Lastly, the taxpayers' utility function used in the Allingham-Sandmo-Yitzhaki model is

clearly based on wrong assumptions on the taxpayers' preferences. It is assumed that taxpayers gain utility only from private income which is decreased by their tax payments. Private benefits from publicly provided goods and services are missing, rendering any payment to the government irrational. Contrasting this assumption, taxpayers clearly benefit from publicly provided streets, schools and healthcare systems which might provide a motive for paying taxes.

4

. Behavioural economics models of taxation

The previous section presented the neoclassical account of taxation, which relies on the assumptions of expected utility theory. This part presents behavioural economic extensions of the classical framework which include more realistic assumptions of taxpayers' behaviour. The survey by Hashmizade *et al.* (2012) gives a systematic account of the various behavioural economic concepts and their application to the field of tax compliance. The authors divide literature in two types of approaches: models using non-expected utility theory and models incorporating social interaction into the traditional framework.

Non-expected utility theory In neoclassical economic models of tax evasion, the taxpayers' compliance decision is usually pictured as a choice under risk with known information on the probability of being detected and fined. Non-expected utility theory can account for taxpayers who overweight the probability of being detected. Dhimi and al-Nowaihi (2007) present a framework of tax compliance which incorporates cumulative prospect theory. Therefore the model accounts for people's tendency to overweight small probabilities and the inclination use a reference income as orientation for decision making (loss aversion). The authors report that this model predicts levels of compliance which are closer to the actually observed compliance rates. Additionally, Hashmizade *et al.* (2012) argue that the probability of

being audited might not be obvious to the average taxpayer. Therefore, they make decisions under ambiguity (uncertainty with unknown probabilities) rather than under risk (uncertainty with known probabilities). The authors refer to the Ellsberg Paradox as an example for people's tendency to avoid ambiguity. Ambiguity-averse taxpayers might be more compliant if the tax authorities conceal specific information on audit procedures and probabilities. Thus, Hashmizade *et al.* (2012, p. 23) conclude that models including these phenomena can make more realistic predictions of the extent of evasion. Furthermore, heterogeneous compliance behaviours across taxpayers are accounted for, if the taxpayers' probability weighting functions differ. This means that in contrast to the standard A-S framework, a model with heterogeneous probability weighting functions can account for differing compliance. However, it remains counter-intuitive also in these models that a rising tax rate is still associated with a reduction of evasion.

Social effects Models trying to incorporate social effects account for the fact that taxpayers' decisions might be influenced by their specific social and cultural environments. They include factors like psychological costs, prestige, fairness, social norms and group effects. The psychological costs connected with tax evasion or financial costs other than the fine can be influential factor that deter people from cheating. For exam-

ple, psychological costs might arise because people fear to be detected or publically shamed (Hashmizade *et al.* 2012, p. 23-24). Hashmizade *et al.* (2012, p. 29) also highlight the influence of fairness on tax compliance: one can distinguish between two concepts of fairness: the fairness towards the government and fairness towards other taxpayers. If government services and publicly provided goods are of poor quality, taxpayers might perceive tax payments as unfair. Similarly, if tax payments vary a lot from one taxpayer

to another, people who are required to pay larger shares might perceive this as unfair. The authors conclude that models including social effects can generally explain the empirical findings better than the standard model or non-expected utility models. They also argue that this shows the importance of social effects in the field of tax compliance (Hashimzade *et al.* 2012, p. 32). The high compliance rate, individual heterogeneity and the reversed effect of the tax rate can be implemented in these models.

5. Experimental evidence

The previous section highlighted the behavioural concepts on a theoretical level. This section turns to empirical evidence on the previously described effects gathered in the laboratory and the field. As the experimental literature on tax compliance is very extensive, no comprehensive literature review is provided. Instead, some studies are highlighted and those studies discussing the important issue of social effects are categorised at the end of the section.

Experiments have advantages compared to theoretical modelling, estimations and survey evidence. Alm (2012, p. 65) argues that experiments, compared to survey evidence, allow for a direct observation of decisions to evade. Theoretical models cannot include all important factors for the taxpayers' decision making without being too complex. Thus, experimental evidence can complement theoretical models. Furthermore, the effects of institutional changes as well as changes in the social environment can be tested. Field experiments yield an increased external validity of the results.

5.1 Measuring social effects: cooperation, social norms and fairness

Experimental research explores the role of social effects for individual decision making in social dilemma situations. Findings suggest that, among others, reciprocity, fairness and social norms potentially shape the

outcome of decisions. Deciding whether or not to pay taxes represents a social dilemma where private and communal interests go against each other, as paying taxes is individually costly but benefits society: taxation is strongly linked to the provision of public goods and services. Governments usually provide these goods for the general public because private individuals would not provide an efficient level of public goods. Taxes are necessary to finance the public provision of these goods and services. Therefore, it seems natural that tax compliance is affected by the quality of publicly provided goods and services. Laboratory experiments have shown that a higher return from public goods leads to increased tax compliance (Blackwell 2007). Social effects have been widely explored in the laboratory using public good experiments. Tax compliance experiments have tested and confirmed these effects. The findings of selected studies are presented below.

Reciprocity Chaudhuri (2011) argues that recent laboratory experiments analysing public good games could identify reciprocity as an important driver of behaviour and conditional cooperation as a relatively stable type of social preferences. Conditionally cooperative individuals cooperate in case they expect their peers to cooperate. On the other hand, they do not cooperate if they expect others to be uncooperative. Of course, the decision in laboratory public

Public good experiments

So called public good experiments are designed to recreate the social dilemma situation associated with a public good in the laboratory. Public goods are characterised by non-excludability and non-rivalry in consumption. These features lead to underinvestment under private provision of public goods.

In a standard public good experiment (for a survey see for example Ledyard 1995; Chaudhuri 2011) an abstract situation of private public good provision is created. Participants are randomly allocated to groups of mostly four participants. Each participant receives a monetary endowment and makes an investment decision: keeping the whole or parts of the endowment or contributing it to a public good. All contributions to the public good are then (for example) doubled by the experimenter and equally split among all group members.

The social dilemma arises because the highest aggregated payoff can be achieved only if everyone contributes all the endowment to the public good. On the other hand, the individual payoff can be increased by keeping the endowment. Standard economic theory would predict free riding of all group members and therefore no contributions to the public good. In contrast, laboratory experiments find substantial heterogeneity in levels of contributions and voluntary cooperation: relatively stable shares of individuals tend to free ride or cooperate conditionally on their peers' behaviour, while others contribute at least conditionally (Fischbacher *et al.* 2001).

Recently, costly peer punishment has been added to the standard game described above and has been shown to increase cooperation (Fehr and Gächter 2000). This framework was used to explore cultural differences in cooperation norms and enforcement (Herrmann *et al.* 2008; Gächter and Herrmann 2009). It has been shown that cooperation norms vary substantially with cultural environment. Initial contributions and punishment behaviour of the participants in the public good games appeared very different across different countries. Interestingly, the norm of cooperation and norm enforcement was shown to be correlated with survey evidence on civic cooperation and the rule of law in the respective countries.

good experiments differs from the taxpayers decisions. The most striking difference is that paying taxes is required by law and evasion is punishable, whereas contributions in the laboratory are voluntary and mostly anonymous. Nonetheless, taxes are usually used to provide public goods and one might presume that taxpayers act conditionally cooperative. This would mean that the voluntary compliance with tax regulations is higher for the case that taxpayers expect others to comply as well and try to engage in higher evasion activities if they expect others to cheat.

Frey and Torgler (2007) confirm the relevance of conditional cooperation for tax compliance. They use an empirical analysis of the European Values Survey from the years 1999 and 2000 to explore conditional cooperation in the field of taxation. The authors report a high correlation between tax morale (justifiability of tax evasion) and perceived level of tax evasion. A drawback to the study is that it solely relies on self-reported data from questionnaires and does not measure actual tax evasion. Furthermore, the direction of the effect (causality) is not entirely clear. Hence, more comprehensive studies might be needed. Bazart and Bonein (forthcoming) find evidence for reciprocal taxpayer behaviour in a laboratory experiment. They report that participants tend to adjust their reported income according to the information about their peers behaviour which they gathered in the previous rounds.

Social norms Herrmann *et al.* (2008) conduct laboratory public good experiments with a second stage of costly punishment in sixteen different countries. The authors find varying punishment patterns across the different subject pools. *Figure 3* illustrates the differences and shows for each subject pool the mean punishment of free riders (pro-social punishment) and the mean punishment of group members who contributed at least as much as the punisher (anti-social punishment). The authors also report a connection between the level of anti-social punishment and the initial level of cooperation in the public good experiment. Herrmann *et al.* (2008 p. 1365-1366) highlight the influence of varying norms of civic cooperation and rule of law for the observed results. Using a regression analysis, the authors show that the respective country's norms of civic cooperation (extrapolated from the World Values Survey) and rule of law (taken from the World Bank Governance Indicators) are both positively correlated with anti-social punishment in the experiments.

Social norms may also influence the compliance decisions of taxpayers. For example, Traxler (2010) develops theoretically how conditionally cooperative taxpayers may condition their decisions on the social norm of paying taxes. However, as shown by Wenzel (2004), the social norm of paying taxes can both increase and decrease payment behaviour of individuals depending on whether they feel belonging to a society (with a particular norm) or not. In another experiment Wenzel (2005) also shows that norm perception may play an important role and hence

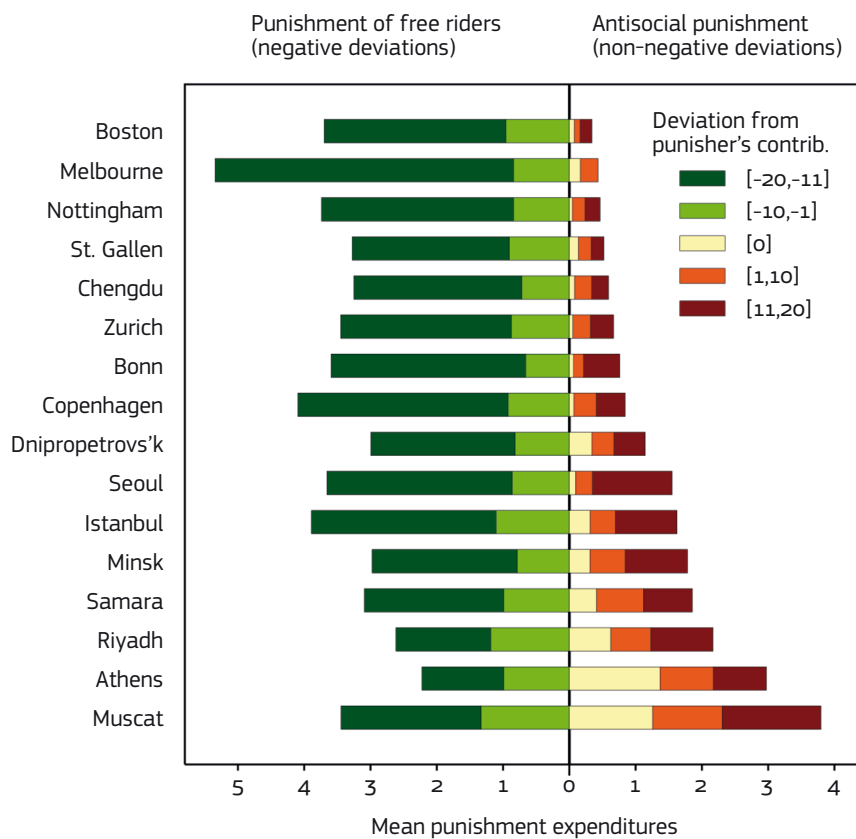


Figure 3: Punishment patterns in different countries.

Source: Herrmann *et al.* (2008, p. 1363).

providing information on the norm may change behaviour. It has furthermore been shown that compliance norms may differ between cultures. Cummings *et al.* (2001) conduct laboratory experiments on tax compliance in Botswana, South Africa and the United States. They argue that the difference in social norms might explain varying compliance across the three countries because the experiment and procedures are the same in the three countries. The authors also control for differences in the risk attitude that might explain differences in compliance in the laboratory experiment. In a further study also Bobek *et al.* (2007) compare tax compliance norms between different countries.

Fairness The issue of fairness is likely to play a role for tax compliance of individuals. Kirchler *et al.* (2008, p. 219) argue that hereby one has to distinguish three dimensions: redistribution, procedures and sanctions. The first refers to the perceived tax burden of a taxpayers compared to their peers. The second aspect deals with how the tax authority treats the taxpayers. The latter refers to the treatment and sanctioning of cheaters. Frey and Torgler (2007) show that a higher institutional quality is associated with higher tax compliance. Taxpayers might be motivated to pay their fair share of taxes to fund an efficient government. Feld and Frey (2002) argue that trust and respectful treatment of the taxpayers is connected to tax compliance.

5.2 The cross-cultural perspective: differences across Europe

As argued above, social effects influence decision making. Social effects tend to differ from one country to another. Thus, differences in culture and social attitudes across countries may help to explain differing levels of compliance. Unfortunately, few studies take a cross-cultural perspective on tax compliance.

Barr and Serra (2010) report the findings from a laboratory bribery game conducted in the UK with students from 34 different countries. The authors report that for undergraduate students, the behaviour of individuals in the experiment can be predicted by the corruption levels in their countries of origin. The authors argue that these findings show a large influence of cultural environment and social norms for behaviour and highlight the cultural aspect of corruptive behaviour. They also find that graduate students who have been living in the UK for longer than the undergraduates adapt their behaviour such that corruption levels in their country of origin cannot proxy the behaviour any more. The authors argue that during the time in the UK students may have adopted the domestic set of values. Similar cultural effects might influence individuals' tax compliance.

5.3 Group identity: patriotism, conflicts and fiscal propaganda

As discussed in the previous sections, social effects influence tax compliance. These effects might be more pronounced for members of a certain peer group. Konrad and Qari (2012) find a strong link between patriotism and tax compliance using an empirical analysis of data taken from the International Social Survey Programme. The survey includes questions on whether one perceives tax evasion as legitimate, which serves as a proxy for tax compliance. The authors aggregate several questions on national pride to a patriotism variable and report a significant positive correlation between patriotism and tax compliance.

Slemrod (2007) discusses the impact of nationalism on taxation. The author points out that appealing to patriotism has been used during wartimes to finance armed conflicts, for example, the United States Secretary of Treasury during the First World War who described the goal of these measures as 'capitalizing patriotism' (Slemrod 2007, p. 40). Therefore, the norm to pay taxes seems to be subject to big variations and largely dependent on their context: during a conflict, a norm of increased tax compliance seems to emerge due to increased patriotism. As mentioned before, governments might of course try to promote patriotism and compliance in such situations.

The implications of conflicts have also been studied in the laboratory. Abbink *et al.* (2010) extend classical individual contest

games by introducing a group contest game with punishment opportunities of non-contributors. They find high levels of inefficient investments into a group contest if non-contributors can be punished compared to an individual contest game. Additionally, inefficient investments in group contests with punishment exceed that of group contests without punishment, which are in turn higher than investments in individual contest games. The authors argue that these findings might shed light on conflicts between political groups: groups of people (even consisting of anonymous individuals randomly allocated in the lab) are prepared to overinvest in rivalries (Abbink *et al.* 2010 p. 438). These findings might be connected to people's increased contributions to conflicts through war bonds and voluntary tax compliance. Furthermore, also the studies by Wenzel (2004, 2005) as discussed above shed light on the issue of group identity.

5.4 Laboratory experiments

As described above, economic experiments have been argued to be especially suitable to explore the field of tax compliance. Hence, non-surprisingly the experimental literature in the field of tax compliance has been increasing in recent years. This subsection sums up the latest advancements in this field.

The standard framework of a laboratory experiment on tax compliance and enforcement (Blackwell 2007; Alm 2012) can be described as follows. Participants receive or earn an income and are asked to declare this income to a tax authority. There is, however,

no automatic test whether the declaration made is correct. Participants pay taxes on the declared income and face a certain probability of an audit. When audited, taxes on undeclared income and a fine have to be paid. This standard framework can be easily altered to test theoretical frameworks, explore the effect of institutional changes, or develop new interventions to increase compliance.

The Allingham-Sandmo-Yitzhaki model of tax compliance, introduced above, makes a counter intuitive prediction on how a rising tax rate would affect compliance. Experiments were used to investigate this issue. Blackwell (2007) conducts a meta-analysis of twenty laboratory experiments, which were carried out between 1987 and 2006. The aggregated data is used to test the influence of a change in the tax rate, the fine rate, the probability of an audit and the per capita return of a public good on tax evasion. For all but the tax rate, the author reports a significant positive effect on tax compliance. Thus, the finding on the effect of a rising tax rate contradicts the initial prediction of the A-S model.

Alm (2012) as well as Alm and Jacobson (2007) provide detailed surveys of experiments on tax compliance. The work in this field can be roughly divided into four types of studies:

1. *Testing theory*: Fines and audit probabilities do not change much in reality. However, people's reaction to changes can be explored with experiments. Alm (2012, p. 66) and Blackwell (2007) show that higher tax rates might lead to less compli-

- ance (mixed evidence), while higher audit probabilities lead to more compliance.
2. *Testing biases in individual decision making:* Taxpayers tend to overweight the probability of an audit (Alm 2012, p. 66).
 3. *Testing the scope of social influences:* Public goods, fairness, social norms, reputation or public shame may influence decisions. A higher marginal per capita return of a tax-financed public good leads to more compliance (Blackwell 2007), publicly announcing the result of an audit can act as an additional punishment (Alm 2012, p. 66) and individual as well as group rewards in case the audit indicates full compliance can increase compliance (Alm 2012, p. 66).
 4. *Developing and testing new measures:* Audit selection rules (e.g. probability depends on the deviation from median reported income).

The standard framework of laboratory experiments widely used to explore taxpayers' compliance decisions, however, also has two central shortcomings. Numerous experiments neglect the positive returns as well as positive externalities of paying taxes which naturally occur through the public provision of goods and services. The aspect that taxpayers receive a return on their payments was shown to increase tax compliance in laboratory experiments (e.g. Alm *et al.* 1992a).

Furthermore, Kirchler *et al.* (2008) describe the 'slippery slope' framework of tax compliance as an insightful way to bring together the evidence gathered in numerous experimental studies. The authors argue that

compliance depends on the power of the authorities and the trust in authorities (Kirchler *et al.* 2008, p. 211). One extreme case of where the 'slippery slope' can lead to is described as the 'cops and robbers' scenario, where the tax authority sees the taxpayers as cheaters who would try to evade if they can. The taxpayer would feel distrust towards the authority and evade whenever it pays off to do so. The opposite is called 'service and client' approach, where the taxpayers feel it is their duty to pay taxes and perceive the authority as a service provider to society (p. 211). The authors suggest that the situation might be different across countries and is typically located between these two extremes. This approach also allows for a cross-cultural comparison of the interaction between the social norms of tax compliance and tax collecting and spending institutions. The framework appears particularly interesting for policy makers, as it can be used to derive policy recommendations depending on the prevailing norms and social environment.

5.5 Field experiments

As mentioned earlier, field experiments promise a high external validity of the results because they take place in a natural setting where subjects are not necessarily informed about participating. This natural environment of tax compliance cannot possibly be modelled by laboratory experiments. On the other hand, similar restrictions like those for observational studies apply. For example, the reliable measurement of tax compliance is difficult and costly. This might be a reason for field experiments in tax compli-

ance being rare. However, some studies exist and further are currently being carried out. This sub-section presents evidence from four recent field experiments investigating tax compliance.

Slemrod *et al.* (2001) describe one of the first field experiments in tax compliance. The authors explore the effect of differences in perceived audit rates by sending a letter to a group of taxpayers in Minnesota. The letter announced a close examination of the tax report which the respective taxpayers were about to file. The tax payments were compared with that of a control group which consisted of taxpayers who did not receive a letter. The authors report that the effect of the letter varies with opportunities to evade as well as with income. Low and middle income groups raised their amount of reported income compared to the control group whereas the high income group did not. The authors report a number of drawbacks to their experimental design such as the relatively small size of the treatment group with 1724 taxpayers and the lack of measuring differences in real evasion and avoidance rather than reported income.

Kleven *et al.* (2011) conduct a large scale field experiment in Denmark to test the effect of audits and threat-of-audit letters on individual income tax compliance, using a representative stratified sample of 42800 taxpayers. The authors argue that their experiment allow them to test the predictions of an augmented classical tax compliance model including third party reporting. The authors argue that this model predicts the

findings of their experimental study reasonably well. The treatments were conducted in two stages. In the first year, half of the sample was randomly selected for an unannounced tax audit. In the second year, taxpayers from both groups were randomly allocated to three treatment groups. The first received a threat-of-audit letter stating that everyone in this group will be audited, the second group received a letter announcing random audits to half of the group and the third group did not receive any letter. An interesting approach of the study is to compare compliance of people subject to third-party reporting and that of self-reporting taxpayers. The authors argue that most taxpayers are subject to third-party reporting and thus might comply with tax regulations because they do not have the possibility to evade taxes. The authors report widespread tax evasion among self-employed, but nearly no evasion for taxpayers subject to third-party reporting. Additionally, they find a small marginal effect of tax rate on evasion for self-employed. Furthermore, they report that previous audits and threat-of-audit letters have a significant effect on self-reported income.

Torgler (2012) explores the influence of moral appeals on tax compliance in a field experiment using a sample of 578 taxpayers from Switzerland. Half of the sample was randomly selected to receive the standard tax form followed by a letter highlighting the moral obligation to pay taxes. It is reported that the letter has a positive effect on tax compliance, although it is not significant. The author points out that using a sample

of taxpayers from a small commune might bias the effect of moral suasion upwards. Therefore, the author concludes that the influence of the messages on tax compliance is very limited.

Hallsworth *et al.* (forthcoming) look at the propensity of taxpayers to pay their outstanding taxes and how norm and fairness messages affect payments. The authors argue that the decision to pay taxes is the second stage of tax compliance which has been significantly less explored than the first stage, the declaration decision (Hallsworth *et al.* forthcoming, p. 5). Another beneficial aspect appears to be that in contrast to tax evasion, the payment of outstanding tax debts is easily and directly observable. Hallsworth *et al.* (forthcoming) describe two large scale field experiments in the UK conducted in 2011 and 2012 using a subject pool of more than 100000 individuals in each of the experiments. In the first experiment, the authors test two fairness and three normative messages which are added to the standard reminder letter for late payment of taxes. The authors report the largest effect for a normative message ('Nine out of ten people in the UK pay their tax on time. You are currently in the very small minority of people who have not paid us yet.'). People in this treatment group were 5.1% more likely to make a payment towards their debts within 23 days after receiving the reminder letter compared to the control group (Hallsworth *et al.* forthcoming, p. 16). The second experiment is implemented the same way and tests for the psychological distance of normative messages as well as the effect of descriptive and in-

junctive norms. General descriptive norms were shown to have a larger effect compared to general injunctive norms. The psychological distance or the normative messages was varied by describing the behaviour of others in the same region ('The great majority of people in your local area pay their taxes on time.')

or in a similar situation ('Most people with a debt like yours have paid it by now.'). More specific norms were shown to have a larger effect. The authors argue that because including normative messages in the reminder letters is relatively cheap, also small effects can be cost effective.

Another interesting study has been conducted by Gangl *et al.* (2013), in which not individual tax payers have been subject to a field experiment, but companies. More specifically, in this study small enterprises in Austria were randomly selected and contacted by a tax auditor. The companies were (relatively) small, began their operations in 2011 and were active in sectors deemed to be prone to tax non-compliance. Companies in the treatment group were approached by a 'friendly' tax auditor and closely audited throughout the year. The control group was neither approached nor audited closely. The study shows two main results: one is that audits reduced the willingness to pay taxes on time, potentially crowding out other motivations to pay. They did, however, reduce the amount due after the official payment date, indicating a two-way effect of the policy.

Concept	Effect	Approach	Author(s)	Evidence
Expected utility theory	Fine rate, audit probability, per capita return of public good	Meta-analysis of laboratory experiments	Blackwell (2007)	The fine rate, audit probability and the per capita return of a public good have a positive impact on tax compliance.
	Opportunities to evade	Field experiment	Kleven <i>et al.</i> (2011)	The compliance rate for income subject to third party reporting is higher compared to self-reported income.
Cognitive biases	Overestimating small probabilities	Theoretical framework	Dhimi and al-Nowalhi (2007)	Incorporating people's tendency to overestimate small probabilities can increase the framework's predictive power.
	Perceived probability	Field experiment	Slemrod <i>et al.</i> (2001)	A higher perceived audit probability generated through a threat-of-audit letter can lead to higher compliance.
		Laboratory experiment	Konrad <i>et al.</i> (2012)	Face-to-face contact with a customs officer increases the perceived audit probability and increases the compliance rate of individuals by 15-20 %.
Social effects	Ambiguity aversion	Laboratory experiment	Dai <i>et al.</i> (2013)	An ambiguous audit environment with unknown probabilities can increase compliance.
	Psychological costs	Laboratory experiment	Coricelli <i>et al.</i> (2010)	Emotions and public exposure can increase the perceived costs of non-compliance.
		Laboratory experiment	Coricelli <i>et al.</i> (forthcoming)	Public shaming can reduce non-compliance if cheaters are reintegrated immediately, compared to a situation where cheaters are being stigmatised.

Table 3: Selected articles on tax compliance.

Concept	Effect	Approach	Author(s)	Evidence
Social effects (<i>cont.</i>)	Moral appeals	Field experiment	Torgler (2012)	The effect of a letter appealing to the taxpayers' moral obligation to pay taxes has limited effects.
	Social norms	Survey evidence	Bobek <i>et al.</i> (2007)	Social norms help to explain the outcome in a hypothetical compliance decision which was part of a survey conducted in Australia, Singapore and the US.
		Laboratory experiment	Lefebvre <i>et al.</i> (2011)	Examples of low compliance erode compliant behaviour whereas good examples do not influence tax compliance.
		Field experiment	Hallsworth <i>et al.</i> (forthcoming)	Reminders letters including a statement that the majority of people already paid taxes were more effective than standard letters.
	Fairness (redistribution)	Laboratory experiment	Alm <i>et al.</i> (1990)	Tax amnesties might have a negative impact on tax compliance if taxpayers perceive amnesties as unfair.
	Fairness (procedural)	Laboratory experiment	Fortin <i>et al.</i> (2007)	Tax compliance might be increased by ensuring a fair and equitable taxation system.
		Survey evidence	Frey and Torgler (2007)	Tax morale is linked to the perceived quality of the institutions.
		Survey evidence	Feld and Frey (2002)	It is argued that tax compliance is higher for Swiss cantons with a higher participation of the voters and that tax authorities of these cantons treat taxpayers more respectfully.

Table 3: (*cont.*)

Concept	Effect	Approach	Author(s)	Evidence
Social effects (<i>cont.</i>)	Reciprocity	Survey evidence	Frey and Torgler (2007)	Tax morale is linked to perceived prevalence of tax evasion.
		Laboratory experiment	Chaudhuri (2011)	Extensive evidence from public good experiments suggests that conditional cooperation is a relatively stable type of social preferences.
		Laboratory experiment	Bazart and Bonein (forthcoming)	Participants adjust their reported income according to the information provided on other people's behaviour.
	Cultural environment	Laboratory experiment	Herrmann <i>et al.</i> (2008)	The cultural environment affects social norms and shapes the outcome in social dilemmas with constant institutions.
			Cummings <i>et al.</i> (2001)	Cultural effects explain differences in compliance in a tax evasion game conducted in Botswana, South Africa and the US.
		Field experiment	Gangl <i>et al.</i> (2013)	Crowding out of intrinsic compliance behaviour in terms of due payments in presence of a 'friendly' auditor; however, lower amounts due at payment date.
	Group effects	Survey evidences	Konrad and Qari (2012)	Strong link between tax compliance and patriotism.
		Laboratory experiment	Abbink <i>et al.</i> (2010)	In group contest games participants tend to overinvest in winning a group rivalry.

Table 3: (*cont.*)

6. Firms: corporate income tax and third party reporting

As described above, most literature in the field of tax compliance focusses on declaration of individual income and payment of individual income tax. The literature on tax compliance of firms is, however, relatively small. There are several reasons for this. One is based on the fact that the main effect of behavioural economics can be found in fields where economic and non-economic factors (psychology, morality) interplay. However, this non-economic element is assumed away for companies, unless the company or entrepreneur is essentially composed of an individual. However, such small (or medium) entrepreneurs again behave similarly to normal (self-declaring) taxpayers. For example, Hibbs and Piculescu (2010) point out that compared to individuals, firms are not influenced by social effects like guilt or shame. However, the authors present a model of tax evasion on the firm level that can explain the frequently observed different levels of evasion in the same institutional environment. The authors argue that depending on the perceived usefulness and quality of goods and services provided by the government, the firms will tolerate taxes. The perception might vary across firms and therefore firms might differ in their tax compliance. Nevertheless, empirical evidence on this reasoning is not available.

The other element is the purely economic side of tax evasion. Although tax audits are much more common for companies than for individuals, it might hence be profitable for companies to evade taxes. However, the problem here is that evasion would have to be carried out by individuals in the company; but this activity is not contractible between the owners of a company and its managers or other subordinates. For example, Kleven *et al.* (2009) describe a model of third party reporting of taxable income. The authors argue that for firms with a large number of employees cheating is not profitable even for a low probability of an audit and low fines. This might be due to the threat of whistleblowers in the company. Therefore, it is difficult for companies to evade taxes, which is illegal activity. Companies can, however, try to reduce the taxes paid within the legal framework—but this activity is tax avoidance, not tax evasion. How tax avoidance could be addressed is not the focus here, although solutions may be found in behavioural economic approaches. The reason for this is that there is almost no literature available on this topic.

It hence remains to investigate the behaviour of small companies who may act similar to self-employed individuals. However, these are already embraced by much of the research on ‘voluntary’ tax payments discussed in the preceding sections.

7 . Discussion

The text introduced the latest evidence from studies exploring the field of tax compliance with behavioural economic and experimental methods. After presenting the problem of measuring tax evasion and non-compliant behaviour, different approaches to circumvent measurement problems were highlighted. Next, neoclassical economic models of tax compliance with their strengths and weaknesses were presented. The extension of the classical model by behavioural economic elements was mentioned, that is, mainly non-expected utility theory moral considerations and social effects. Furthermore, recent empirical evidence from experimental economic research was discussed. Much of this empirical literature is based on questionnaire-based observational as well as on experimental studies. Many of these studies investigated the impact of factors such as norms, fairness or peer pressure, indicating that may have a significant influence on tax compliance by individual tax payers.

Additional insights may also be gained by considering cultural effects, which could be driving differences of compliance levels between countries. For example, experiments on tax compliance can be used to test theoretical models and novel institutions, but also for measuring cross-cultural differences.

Summarising main results of the research surveyed here, the literature has identified behavioural economic tools that influence

compliance. These translate into the following promising approaches which tax authorities might adopt to boost voluntary compliance:

- Signing honour codes and tax self-reports at the beginning, before filling in the details to trigger more compliant behaviour. It was argued that this reminds people of their moral concepts and self-perception as an honest and law-abiding citizen (Shu *et al.* 2012).
- Higher institutional quality is associated with an increased intrinsic motivation to pay taxes (Frey and Torgler 2007).
- Trust in governments and tax authorities can help to maintain a high level of compliance (Torgler 2003).
- Promoting social norms on tax compliance can be vital.
- A shift from an enforcement oriented tax authority to a more service oriented approach, providing information and assistance to taxpayers can increase tax compliance (Traxler 2010).
- Cultural effects should be taken into account when shaping policy measures to boost tax compliance.

After discussing potential positive influences of social effects on tax compliance and potential intervention to benefit tax compliance, a caveat connected to tax compliance should be addressed as well. Torgler *et al.* (2003, p. 376) discuss the effects of tax am-

nesties which are in place in many European countries. The authors conduct laboratory experiments in Costa Rica and Switzerland and find that regular amnesties decrease tax compliance in the long run. It is argued that amnesties can decrease the government's credibility and the taxpayers' intrinsic motivation to comply. Still, systematic evidence on the effects is still missing. One can argue that if tax amnesties reveal that a high share of people evaded taxes, norms of voluntary compliance can be affected. This is especially the case for conditionally cooperative taxpayers whose compliance decision depends on the actions of other taxpayers. Furthermore, compliant taxpayers might perceive

their tax burden as unfair compared to others if they learn that evasion is prevalent. Alm *et al.* (1990) conduct a laboratory experiment on tax amnesties and come to a similar conclusion. The perceived fairness of the amnesties plays a big role; only well designed tax amnesties accompanied with higher enforcement might not impact general tax compliance. Another paper showing that not all behavioural economic policies promote tax payments in the long terms is Coricelli *et al.* (forthcoming). Here the authors show that putting individuals into a shameful situation after being caught evading taxes has a detrimental effect if shaming persists for several rounds.

8. Conclusion and Outlook

Taking together results presented in this survey, the general statement is hence that behavioural economic factors can significantly influence tax compliance, and if well applied, usually cause an increase in compliance. However, there does not appear to be a uniform, one-size-fits-all approach of using insights from behavioural economics. Besides this very broad and general conclusion, what can be gained for policy-makers and where would more (applied) research provide most promising additional insights? For policy-makers and administrations such recommendations could include:

- Consider the use of moral suasion in tax collection efforts if the number of non-compliers is originally low in the population.
- Use the potential overestimation of individuals to be audited or the willingness of people to participate in lotteries.
- Also consider that culture is an important factor and that good government, that is, the public benefit character of the state is a main motivator for tax compliance.
- Use behavioural economic measures with caution, and pre-test them (including a scientific evaluation) in the field.

The following elements seem of particular relevance (again from the demand side of tax administration and policy-makers) for the research we intend to conduct in this area:

- While cross-cultural effects appear very likely to exist in the area of tax compliance (transferring from more general insights gained through economic experiments) further studies with similar or the same design across cultures could prove to be very fruitful.
- Most research has been conducted in countries and experimental frameworks where tax compliance is relatively high. It would be interesting to also understand the effects of behavioural economic policies when tax compliance is originally low in a culture (or in an experiment).
- The effects of peer feedback, for example when auditing particular groups of taxpayers, appear interesting and practically highly relevant.
- More field experiments are warranted to increase the external validity of existing research.

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