Journal of Economic Psychology xxx (2013) xxx-xxx



Contents lists available at ScienceDirect

Journal of Economic Psychology

journal homepage: www.elsevier.com/locate/joep



Review Behavioral dynamics of tax evasion – A survey

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ARTICLE INFO

Article history: Available online xxxx

JEL classification: H26

PsycINFO classification: 2960 3020 3040 2360 4270

Keywords: Tax evasion Theoretical models Psychological and economic experiments Agent-based models

ABSTRACT

Since the 1950s (Schmölders, 1959) it is well known that behavioral aspects have an influence on tax evasion or tax compliance. In particular, interactions among the various entities involved in the taxation process (e.g. taxpayers, law makers, tax practitioners, tax authorities, etc.), and the dynamics that these interactions may generate, seem to play an important role for the actual level of tax compliance. However, the mainstream neoclassical approach to tax evasion (Allingham & Sandmo, 1972) cannot account for such interactions and dynamics. Therefore, during the last two decades new approaches (e.g. lab experiments, agent-based modeling, etc.) have been developed with a view to model how behavioral dynamics may foster or prevent tax evasion. In addition, empirical evidence has been generated that supports a role for such interaction dynamics. In this contribution we survey the main developments in this research area and provide some suggestions for further research.

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[†] Shortly before this paper could be finished, Michael Pickhardt deceased on October 2, 2012.

0167-4870/\$ - see front matter © 2013 Elsevier B.V. All rights reserved. http://dx.doi.org/10.1016/j.joep.2013.08.006

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1. Introduction

Analyzing non-compliance with taxation duties goes back to the seminal contributions of Allingham and Sandmo (1972), Srinivasan (1973)¹ and Yitzhaki (1974). Since then the topic has received an ever growing interest and today, issues of tax evasion and related aspects such as corruption, money laundering and the shadow economy are relevant for many of the present economic problems.

This notwithstanding, important elements of the decision leading to individual non-compliance with taxation schemes have only recently received some attention. In particular, this is true for the interaction of agents involved in the taxation process and the dynamics which these interactions may generate. Therefore, this contribution is devoted to survey the literature on behavioral dynamics of tax evasion with a view of summarizing its findings and suggesting a future research agenda.

A particular point is noteworthy just at the beginning of this paper. Most studies on tax evasion do not differentiate either with respect to the kind of tax – i.e., whether it is income tax, VAT or any other tax – or with respect to the person or organization evading the tax. In a certain sense, almost always a kind of income taxation seems to be implicitly supposed. In addition, an individual decides whether and how much to evade, which is especially true for laboratory experiments. However, as pointed out by Alm (2012a), p. 55, tax evasion and avoidance is similarly possible with other taxes too. Consequently, research results are relevant for all taxes.

This contribution is organized as follows. In Section 2, we structure the behavioral dynamics of tax evasion as a tax 'game', i.e., the focus is on the interactions between subjects and institutions. In this way, crucial links between these persons and institutions will emerge in a 'natural' way, defined by the institutional setting and the socio-economic embeddedness of taxpaying. Section 3 contains the main results of the various disciplines and approaches of tax compliance research. The discussion in Section 4 is intended to consolidate the main findings and to hint at blind spots and holes of research. Section 5 concludes.

2. Tax evasion and the modeling of behavioral dynamics

2.1. Tax game: the big picture

In this section, the structure and interdependence of the relationship between taxpayers, tax authorities and tax practitioners² are analytically described. This depiction is a kind of upshot of the existing literature on tax evasion and compliance. To present the whole picture and to avoid the risk of missing the main points because of too many details, we deliberately abstain from quotations to a very large extent. Nevertheless, in Section 3 those contributions are quoted which have been so far crucial for our view of the subject matter.

Tax compliance as well as tax avoidance and evasion are processes in which individuals interact directly or indirectly with each other. However, since taxation is a highly structured process of institutionalized entities like 'taxpayers', 'tax authorities', 'tax practitioners' up to 'tax lawmakers', individual tax behavior is embedded in and influenced by social structures norms and roles (see also Alm, Kirchler, & Muehlbacher, 2012; Alm, Kirchler, Muehlbacher, Gangl et al., 2012; Kirchler, Muehlbacher, Kastlunger, & Wahl, 2010).³ It is to be expected that there exist certain role-models of taxpayers as well as of the other players in the game of taxation.

Fig. 1 represents the institutional infrastructure of the players and their (actual as well as potential) interactions (depicted by lines between the players).⁴ For sake of readability, three kinds of lines are employed: bold lines represent direct (and legally structured) interactions, simple lines indicate actual and/or potential contacts and dashed lines signify indirect (actual or potential) influences. To start with, taxpayers may interact with each other by exchanging information about the behavior of tax authorities, by giving informal advice in tax matters, by cooperating in tax evasion (e.g., by working in the shadow economy) and in many other ways. Their connections are depicted by simple lines. In the same way interactions of taxpayers and tax practitioners are shown in Fig. 1 since taxpayers may consult the latter for filing tax returns or for professional advice in tax matters.

¹ Note that the paper of Srinivasan was submitted earlier than the Allingham-Sandmo paper, but published later; see Hokamp (2012), p. 9, footnote 6.

² There exist different notions for persons who professionally consult and advise persons in tax matters: tax advisers, tax practitioners, tax preparers, tax consultants, tax accountants. In the following, 'tax practitioners' is used for these persons.

³ A general sociological theory which fits well to capture the kind of social interactions and embededdness considered here is presented in Durlauf (2001); see also the "wider context", i.e., "the tax system as a whole and the environment in which it has to operate", James & Edwards, 2008, p. 35. For social interactions in economics see Manski (2000). Nerré (2008) suggested "tax culture" as an idea to include the "national tax-cultural diversity" in an "embeddedness approach" (Nerré, 2008, p. 153). Ho and Wong (2008) review literature on ethical attitudes and tax compliance. For major research on tax morale see Torgler (2002, 2007), Torgler and Schaltegger (2006), Alm and Torgler (2006, 2011), Frey and Torgler (2007), Demir, Macintyre, Schaffner, and Torgler (2008), Cummings, Martinez-Vazquez, McKee, and Torgler (2009), Alm and McClellan (2012), Pope and McKerchar (2011) and McKerchar, Bloomquist, and Pope (2013).

⁴ Note that tax courts are not represented in Fig. 1 although their decisions may have a strong influence on the behavior of both taxpayers and tax authorities.



Source: Own depiction.

Fig. 1. The tax game.

The most important interaction, however, is the contact between taxpayers and tax authorities (indicated in Fig. 1 by bold lines). This interaction is hierarchically structured insofar as the tax authorities can enforce tax laws and punish deviant taxpayers. Therefore the taxpayer and tax authority interaction is at the core of the taxation game. Not surprisingly, it attracted by far the most attention of research in economics as well as in psychology.

The role of tax practitioners in the tax game is interesting in itself. On the one hand they are allies of taxpayers, on the other hand they have a legal obligation to obey tax laws when professionally advising taxpayers. In this way they have direct contacts with tax authorities (bold lines in Fig. 1). It is to be conjectured that professional advisers may help taxpayers to minimize their tax burden which might be interpreted as support for tax avoidance. Because tax practitioners interact on a regular basis with tax authorities, they might know the strategies of the authorities better than individual taxpayers.

Also the interaction of tax authorities, tax practitioners and even taxpayers with tax lawmakers is noteworthy (indicated in Fig. 1 by dashed lines). Although there should be strict separation of lawmakers from tax authorities and tax practitioners, it would be a serious mistake to assume that there might be no significant interaction. The reason is that – in all developed countries at least – tax laws are a very complicated subject matter which requires a lot of knowledge to be understood. As a consequence, without support from tax authorities as well as tax practitioners lawmakers might be lost in the complexity of their own tax laws. It seems not too farfetched to argue that the more complex tax laws grow the more important becomes the influence of the tax authorities, tax practitioners and even big taxpayers as, e.g., large firms and diverse lobbies.

To sum up, the game of taxation consists of strategic interaction of taxpayers, tax practitioners, tax authorities and tax lawmakers. At the core of the game, tax authorities interact with taxpayers in a hierarchical and highly formalized manner. Beside tax compliance, tax evasion is also a strategy of taxpayers in this game. Important research questions are when, how and why taxpayers do or do not comply with tax laws.

2.2. Subgames of the tax game

The tax game as a whole may be decomposed into four subgames: (1) taxpayers vs. taxpayers, (2) taxpayers vs. authority, (3) taxpayers with practitioners vs. authority, and (4) tax lawmakers vs. taxpayers. These subgames are crucial for the understanding of the behavioral dynamics of tax compliance as well as tax evasion. As will be argued in Section 2.3, research progress concerning the decision to pay or not to pay taxes fully has been generated to a very large extent by two factors: (i) the inclusion of tax-related psychological and social psychological behavioral aspects due to the rise of behavioral economics and (ii) to a specific dynamic theoretical modeling in economics with agent-based methods.

For the subgame (1) between taxpayers, *individual characteristics* of taxpayers, as well as their *social interactions* and their *social embeddedness* play a crucial role. On the individual's side, personality, age, gender, education and personal norms ('tax morale') prepare the stage. Networks, cliques and communities of taxpayers are the relevant categories for social interaction of taxpayers because they describe how groups of otherwise isolated individuals may be formed (Borgatti, Mehra, Brass, & Labianca, 2009). In this respect, 'network' is the superordinate concept for a large group of people who are directly and indirectly connected to each other, e.g., the population of taxpayers in a country; 'communities' are (probably overlapping) subgroups of taxpayers, e.g., by employing the same tax practitioner (see for general definitions of these notions Girvan & Newman, 2002; Newman, 2010; Palla, Derényi, Farkas, & Vicsek, 2005; Porter, Onnela, & Mucha, 2009, pp. 194 f., 354 ff.). Social embeddedness, finally, propagates social norms in ways of social 'contagion' (Lefebvre, Pestieau, Riedl, & Villeval, 2011; Mason, 1987; Bazard & Bonein, 2013) where the structure of personal networks may play a crucial role. Therefore, individual characteristics, social interactions and social embeddedness are apparently decisive elements for the dynamics of tax evasion and compliance.

The subgames (2) between taxpayers and authorities are dominated by three aspects: the employment of '*power*' (i.e., detection probabilities and fines for tax fraud) and '*services*' (i.e., providing information and assistance to taxpayers) as well

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as the level of '*trust*' (i.e., to assume generally on the side of tax authorities that taxpayers are honest and on the taxpayers' side that tax authorities are fair; for trust in relation to taxation see Chorvat, 2006) between taxpayers and authorities. These three aspects determine to a large extent whether taxpayers and authorities behave cooperatively or non-cooperatively. Most important, however, is the fact that 'trust' is a bilateral relation for it exists only if taxpayers are trusting authorities and vice versa. However, according to Kirchler, Hoelzl, and Wahl (2008), the emphasis on 'power' and 'trust' may depend on taxpayers' characteristics; 'evasion-minded' taxpayers will presumably react on 'power' whereas for 'compliance-minded' ones 'trust' might be of crucial importance (Prinz, Muehlbacher, & Kirchler, 2013).

Tax practitioners may also play a major role concerning tax evasion and compliance, as indicated by subgame (3) above. As a profession, tax practitioners are located in-between taxpayers and authorities as they know the tax laws and are obligated to abide these laws. Nonetheless, they know how to avoid taxes and to circumvent tax laws. As a consequence, they *inform* taxpayers and they may be able to *coordinate* taxpayer behavior with respect to both tax evasion as well as compliance.

Subgame (4) between taxpayers and tax lawmakers is the most indirect game whereby taxpayers cannot know to what extent they may influence tax laws. Tax laws provide the '*rules of the tax game*'. Since these rules constitute the framework of taxation, they are highly relevant for the outcome of tax games, but also for the atmosphere between taxpayers and the authorities. Because of the outcome relevance and the complexity of tax laws in developed countries, tax lawmakers are relatively easy targets of *lobbies* and *interest groups*. As a consequence, tax lawmakers may depend to a large extent on expert's tax knowledge provided by tax authorities as well as industrial associations and taxpayers' unions, for instance. Tax laws as well as the attitude of tax authorities to taxpayers are determining the atmosphere in taxpaying as they define whether and to what extent cooperation between taxpayers and authorities may be possible. It is noteworthy to add that cooperation between taxpayers as well as authorities are playing roles assigned by tax laws, but in a way that both sides trust each other in the sense that the relationship is free of suspicion and exploitation.

2.3. Research and modeling strategies of the tax game

Given the strategic nature of the social interactions between all players in the tax game, the subject matter of research in tax evasion shows a complexity which mirrors the complexity of taxation. Over a time span of at least 40 years, several academic disciplines conducted research on tax evasion and compliance. Table 1 gives an overview on involved academic disciplines.

Note first that law as an academic discipline is not represented in Table 1. Although law is a very important academic discipline for understanding and interpreting tax laws, it seems not to present an idiosyncratic research approach to tax evasion that is not represented by the other academic disciplines. Therefore it is not contained explicitly in Table 1; moreover, we do not review specific law papers on tax evasion. Additionally, it should also be emphasized that tax evasion and compliance by firms and corporations is not considered here either.

The academic disciplines (defined here is the same way as they are in contemporary university departments; the tools and methods they apply are discussed below) with important contributions to research on tax evasion and compliance considered relevant here are then economics, (social) psychology, sociology and econophysics (a recently developed discipline in physics where methods from statistical physics are applied to economic phenomena; see, e.g., the textbook of Sinha, Chatterjee, Chakraborti, & Chakrabarti, 2011). In economics, modern research on tax evasion started with Allingham and Sandmo (1972) as well as Srinivasan (1973) and Yitzhaki (1974) by applying the neoclassical Becker (1968) model on criminal activity - the so-called SMORC (Simple Model of Rational Crime; Ariely, 2012, p. 11) - to tax evasion; the standard economic approach of tax evasion is also dubbed the ASY (Allingham-Sandmo-Yitzhaki) model.⁵ As indicated by Kirchler (2007), p. 1, psychological research on tax behavior began to gain ground after 1980 with increasing numbers of publications. Emphasized by sociologists, social interactions and social embeddedness are crucial for a comprehensive understanding of tax evasion, as is the relation of state and society (Leroy, 2008, 2011). Many interdisciplinary and multidisciplinary studies recognized this and incorporated social aspects into their research design. Moreover, recently a 'new fiscal sociology' has been established (Martin, Mehrotra, & Prasad, 2009) although there are important contributions to fiscal sociology in the first half of the 20th century (see the contributions in Backhaus, 2005, for a comprehensive survey; for an overview on 'tax sociology' see Leroy, 2008, and the literature quoted therein; for an understanding of the connection between the state and individual preferences see Wagner, 2007). Even more recently, the newly created discipline of econophysics began to apply its methods to tax evasion with papers of Lima and Zaklan (2008), Zaklan, Lima, and Westerhoff (2008) and Zaklan, Westerhoff, and Stauffer (2009).

As shown in Table 1, the approaches to analyze tax evasion can be classified as follows: First of all, disciplines developed own modeling strategies of tax evasion whereby the modeling in (social) psychology and sociology is in most cases not formalized mathematically. Economics started with rather static neoclassical models and advanced later to dynamical models. In contrast, (social) psychology, sociology as well as econophysics provided dynamic approaches just from the start. However, since behavioral economics – the incorporation of psychological effects into economic models – was fully accepted in economics, the economic theory of tax evasion also became dynamic.

⁵ For more complete overviews on recent developments in the economics of tax evasion see Slemrod and Yitzhaki (2002), Sandmo (2005, 2012), Slemrod (2007), Kornhauser (2007), Torgler (2007, 2008) and Alm (2012a).

Please cite this article in press as: Pickhardt, M., & Prinz, A. Behavioral dynamics of tax evasion – A survey. *Journal of Economic Psychology* (2013), http://dx.doi.org/10.1016/j.joep.2013.08.006

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Table 1

Academic disciplines and research approaches in tax evasion and compliance. Source: Own depiction.

$ \begin{array}{c} \text{Approach} \longrightarrow \\ \text{Subject} \\ \downarrow \end{array} $	Theoretical modeling	Empirical	Experimental	Agent-based					
(Social) Psychology	х	x	X						
Sociology	х	x							
Economics	x	x	×	X					
Econophysics	x			x					
Source: Own depiction.									

In addition to theoretical modeling, economics, (social) psychology as well as sociology have employed empirical tests of their models. The intention was to determine the variables that have a strong impact on tax evasion and to quantify their effects econometrically. To study more intensely individual behavior by being able to control the framing of decisions, laboratory experiments had been first conducted in psychological research. Later on, economic research followed suit. However, the knowledge of individual taxpaying attitudes is not sufficient to predict the social dynamics of all taxpayers in a society. As already said in the previous section, the tax game consists of a huge number of strategic interactions of all players. Groups of players may behave differently in comparison to each taxpayer individually. To study the dynamics of the entire interaction of people in a society new methods are required. Applying methods from statistical physics, computational and evolutionary economics as well as computational physics, behavioral dynamics of all taxpayers in a model society can be analyzed in so-called agent-based models. Of course, model societies are much less complex than real societies. But since it is not yet possible to study real societies in the same way as virtual ones, simulations of agent-based models are used as research tools for the study of tax evasion in economics and econophysics, thereby incorporating components and aspects (social interactions and embeddedness) from psychology and sociology. Last but not least, results from experimental methods and agent-based modeling are being combined in economics recently, for instance by Bloomquist (2011).

Meanwhile tax evasion and compliance are studied interdisciplinary. This is indicated in Table 1 by circles drawn around interdisciplinary approaches in modeling as well as empirical, experimental and agent-based research. In particular, economics and psychology join research forces to a greater extent. The development and acceptance of behavioral economics paved the way for such research. The methods applied are empirical and experimental. Moreover, since econophysics became a new subject matter in physics, there is also interdisciplinary cooperation of economists and physicists. The methods applied are in this case theoretical models as well as agent-based simulation approaches. As a consequence, there exist seemingly two different cultures of interdisciplinary research in tax evasion: cooperation between psychology and economics which is mainly empirical and experimental, and cooperation between physics which is predominantly theoretical and agent-based.

For the survey of the literature conducted here the existing overviews mentioned above as well as an annotated bibliography of James and Edwards (2010) proved very helpful. The criteria for selecting topics and papers were as follows: (1) Papers that document the most recent developments of research in the area surveyed here; (2) papers that provide either a connection of economic and psychological aspects of tax evasion and compliance or papers that enhance our theoretical, empirical and experimental understanding of the dynamics of the process of (non)compliance and (3) papers that consider aspects of the tax game that are not so often included in other comparable surveys as, e.g., agent-based models.

3. Tax game: research results

3.1. Taxpayers vs. tax authorities

3.1.1. Economics

All papers in the first wave of ASY papers on tax evasion (in the SMORC tradition) assume that individuals conduct their own cost-benefit analysis of paying or evading taxes, excluding any contact with other taxpayers. Knowing the detection probabilities as well as the penalty function, they decide under risk how much of their tax duties they actually will pay.

The strand of papers which followed ASY did not consider psychological, social or moral aspects of taxpaying. The level of tax evasion is determined by the tax rate, the penalty function, the detection probability of tax fraud as well as by the taxpayer's degree of risk aversion (for an analysis and an alternative assumption on the relation between tax rate and penalties see Gahramanov, 2009). Since ASY is a partial equilibrium, comparative static neoclassical model, Dalamagas (2011) incorporates it into a neoclassical growth model to make it dynamic, and analyzes the effects of tax enforcement policies, taking into account the average tax burden of the economy. Although the results do not differ widely from those of the standard model, the policy effects seem to be stronger and more clear-cut (Dalamagas, 2011).

Most recently, Kleven, Kreiner, and Saez (2009) as well as Kleven, Knudsen, Kreiner, Pedersen, and Saez (2011) pointed to a rather obvious, but overlooked extension of the ASY model that might improve the predictions of the standard model concerning its empirical implications: the differentiation between income that is self-reported and income reported by a third party (Kleven et al., 2011); tax evasion of third-party reported income is quite difficult whereas it is much easier when it is self-reported. If firms are sufficiently large, their business records create a truth revealing threat such that collusion between an employer and an employee can be easily detected; hence third-party reporting may improve tax enforcement even with low audit rates and low penalties (Kleven et al., 2009).

However, the question is whether there is empirical evidence for the theoretical implications of the ASY model. Tax evasion in ASY models is interpreted as strategic taxpayer's choice under uncertainty and, therefore, takes place clandestinely. This makes it empirically very difficult to *measure* the level of tax evasion as a whole and to find the determinants of taxpayers' tax compliance decisions (Slemrod & Weber, 2012; for a short overview on survey methods of tax evasion see Alm, 2012a). Although there are very large and still growing numbers of empirical papers on tax evasion, their reliability as well as their policy implications are not entirely clear (Alm, 2012a; Slemrod & Weber, 2012).

As already pointed out by Alm (2012a), given the poor and doubtful quality of the data on individual behavior, it is not possible to state definitive empirical answers to important questions about the effects of tax policy variables of the ASY model on tax compliance. It seems that higher tax rates reduce compliance and higher costs of non-compliance (audit rates and penalties) decrease tax evasion, whereby the latter effect may be rather small (Dubin, Graetz, & Wilde, 1990; Alm, 2012a; Kirchler et al., 2010) or even undesired (Bergman & Nevarez, 2006). In experiments, Alm, Deskins, and McKee (2009) found that income without third-party reporting, higher incomes as well as higher tax rates and lower auditing probabilities induced less tax compliance. Overall, nonetheless, the empirical evidence for the ASY model is not good. This called for more elaborate models to explain tax behavior.

Behavioral economics provided new models for the tax evasion decision (Congdon, Kling, & Mullainathan, 2010; Cullis, Jones, & Lewis, 2006; James, 2006), as it replaced strict economic full rationality by bounded rationality with respect to time discounting (hyperbolic discounting: Chorvat, 2007), behavior under uncertainty (prospect theory: Schepanski & Shearer, 1995; Yaniv, 1999; Dhami & al Nowaihi, 2007; Trotin, 2010; Xu & Wang, 2007) and the framing of the tax (Copeland & Cuccia, 2002; Watrin & Ullmann, 2008). For instance, Eide, von Simson, and Strøm (2010) found evidence in Norwegian survey data for an explanation of high tax compliance by weighted subjective punishment probabilities according to the so-called 'rank-dependent expected utility theory' (Ouiggin, 1982; in this version of expected utility, events with low probabilities are overweighted). Comparing a simulated adaptive learning process of audit and penalties with actual learning in an experiment, the importance of such processes among taxpayers could be demonstrated (Soliman, Jones, & Cullis, 2013). A similar procedure is reported in Bernasconi, Corazzini, and Seri (2013) where the legal tax rate did no longer have an impact on tax evasion because of hedonic adaptation. In experiments by of a regime change from a progressive tax to a flat tax (Heinemann & Kocher, 2013), tax compliance increased (see also Gorodnichenko, Martinez-Vasquez, & Peter, 2009; Ivanova, Keen, & Klemm, 2005). Moreover, gainer of a tax regime change became more compliant; when taxpayers could choose a tax regime, participants in favor of a progressive tax were more compliant, demonstrating social preferences (Heinemann & Kocher, 2013). Hence, all in all the assumptions of behavioral economics are seemingly more appropriate to reproduce results of empirical and experimental evidence on tax evasion and compliance behavior.

In another wave of papers on the economic theory of tax evasion also non-economic aspects of tax evasion have been included. Morality and social custom were introduced first as psycho-social phenomena. In an elaborated model, Benjamini and Maital (1985) assumed a social stigma when detected as a tax dodger (also Allingham & Sandmo, 1972, mentioned such an effect) and represented it as a disutility factor in the individual's utility function. As a consequence, the social stigma of being known as a tax dodger reduces the amount of tax evasion. Cho, Linn, and Nakibullah (1996) used this kind of model and added risk neutrality and a renegotiation game concerning the size of the penalty when detected as tax evader. Individual morality as a determinant of tax evasion was introduced by Gordon (1989). He supposed that detected tax evasion causes private psychic costs. It is noteworthy that Benjamini and Maital (1985) as well as Gordon (1989) make their models dynamic by assuming that the development of the number of tax dodgers depends on the number of taxpayers who also cheat on taxes. To overcome a fixed static separation of taxpayers in honest and dishonest ones as in Erard and Feinstein (1994a), these authors build parameters for guilt and shame into the utility function that are assumed to be proportional to the level of relative tax cheating (Erard and Feinstein (1994b). Traxler (2010) endogenizes the evolution of the social norm of tax compliance by extending thoroughly the model of Gordon (1989). Moreover, Balestrino (2010) uses a so-called "conformism game" to formalize the endogenous development of the stigma of detected tax evasion. In a rather unknown paper, Schmidtchen (1994) considered tax morale as the best response of taxpayers to the insecurity due to the complexity of tax laws: consequently, tax evasion may be the lower, the less comfortable taxpayers feel with respect to the tax laws. This is also the result of a model with uncertain tax policies (Alm, 1988, 1992a; see also Snow & Warren, 2005, for the role of "detection uncertainty").

Bordignon (1993) assumed that individuals try to correct the terms of trade of the provision of public goods for paying taxes by considering fairness aspects. Tax evasion may then be interpreted as a means for correcting these terms of trade. In Myles and Naylor (1996), tax morality is defined as conformity to social customs. Tax evasion occurs if a higher level of expected utility may be achieved with evasion than otherwise. Eisenhauer (2006, 2008) assumes that there is a 'shadow price of morality' in the standard model of tax evasion and shows that a "remorse-based disutility" of tax evasion can be quantified in terms of money (Eisenhauer, 2008). In Dell'Anno (2009), taxpayers have a utility function that incorporates moral rules, fairness and the relationship between government and taxpayers. With psychic costs (disutility) of tax evasion, the dynamics of tax evasion on the aggregate level is studied.

It is worth emphasizing that the extensions of the ASY-model presented here could not have been developed without psychological research on human behavior and its growing acceptance in economics. Insofar almost all economic research on tax evasion and compliance owes a lot to psychology.

In contrast to the models considered up to this point, Frey and Holler (1998) solve the game between taxpayers and tax authorities by using maximin strategies instead of Nash strategies. This implies that taxpayers attempt to get what they can guarantee themselves, given the strategic actions available to tax authorities. The outcome of this game, to cheat or not to cheat on taxes, is surprisingly *not* affected by penalties and detection probabilities as it is in Nash games. The authors conclude, therefore, that tax policy should take measures to improve the level of tax morale in a society since deterrence policies might not produce the wanted effects. Neumärker and Pech (2011) analyze a general equilibrium tax game between a predatory state and taxpayers where the state must employ decentralized tax authorities for law enforcement; even in this rather extreme setting the state will not use maximum penalties to enforce tax laws.

Experiments in the laboratory are quite common in psychology, and now in economics too (Bardsley et al., 2010). However, concerning tax evasion such experiments are vitally important as the empirical measurement of this clandestine behavior is difficult and sometimes impossible. As surveys and questionnaires are not particularly reliable with respect to illegal activities (Slemrod & Weber, 2012), experiments are a kind of in-between method to combine rather directly economic and psychological theory with evidence. For this reason, experiments apparently play a more important role concerning tax evasion than with other legal activities. Nevertheless, a cautionary tale is to be added. As the economist John List demonstrated impressively, the results of experiments should not be taken as empirical evidence for the behavior of persons in real-life situations (Alm, 2012a; Levitt & List, 2007). By repeating an experiment where the participants selected themselves knowingly and voluntarily in form of a field experiment, i.e., in a situation without self-selection and without the explicit knowledge to take part in an experiment, large differences in the results were found (List, 2006). In lab experiments, self-selection effects are unavoidable even if the behavior under scrutiny is not openly announced. The experiment, its organizers as well as its setting, will create intrinsic motivations to participate or not, and this self-selection effect can hardly be controlled for. As a consequence, experimental evidence should be interpreted cautiously, especially when it concerns morally blameful actions like tax evasion. But as all other feasible methods exhibit also flaws and limitations, experiments are a valuable tool to investigate tax evasion and compliance.

Since there exists a very large number of experimental studies – whose results are reviewed, for instance, by Torgler (2007), Alm and Jacobson (2007) as well as Alm (2012a) –, only the studies of James Alm and his coauthors are explicitly considered here because they introduced a new paradigm for tax authorities. To increase the level of tax compliance, a certain change in the attitude of tax authorities seems to be advisable: treating taxpayers as customers by introducing a "service paradigm" as a complement to the prevailing "enforcement paradigm" (Alm, 2007, 2012b; Alm, Cherry, Jones, & McKee, 2010); supporting taxpayers in declaring and paying taxes decreases uncertainty and information costs and may at the same time increase bilateral trust.

3.1.2. Psychology

In contrast to economics, in psychology there are only a few purely theoretical contributions to tax evasion and compliance (however, see Oh & Hong, 2012, for a formalized analysis of "trust in government" and "willingness-to-pay"). Economic models, to be mathematically tractable, are highly stylized and produce theoretical founded hypotheses that can be tested empirically and experimentally. Psychological models are mostly described verbally and put to experimental test immediately. Therefore, almost all papers reviewed in the following are simultaneously theoretical as well as experimental or empirical investigations.

As pointed out by Kirchler (2007), there was a long road to the contemporary socio-economic theoretical frame of tax behavior (see also Kirchler, 2007, for an overview). Because of the excellent review of the earlier literature in Kirchler (2007), in this survey predominantly more recent contributions are included.

To start with, Kirchler (2007, p. 3) provided a framework to analyze tax evasion and compliance by distinguishing between "social representation of taxes" (i.e., "subjective knowledge and mental concepts", "attitudes", "norms", "behavior control", "fairness" and "motivation to comply"), the "tax compliance decision" and "interactions between tax authorities and taxpayers" (Kirchler, 2007, v and vi). A comprehensive overview of the relevant external (or 'economic') and the internal (or 'psychological') variables for voluntary tax compliance can be found in Hofmann, Hoelzl, and Kirchler (2008). In addition to that, Braithwaite and Wenzel (2008) presented this framework from a *consumer* and a *citizen* viewpoint: tax system design and management are supposed to form individual tax behavior which depends also on the individual's social environment. Moreover, the acceptance of coercion and the perception of justice seem individually relevant. For voluntary tax compliance,

the interaction between community and government as well as tax authorities to align a pro-tax environment is seen to be decisive.

As it is very difficult to provide a complete frame of tax decisions which is also quantifiable – this would require a cybernetic model with positive and negative feedback-loops as, e.g., in Forrester's System Dynamics (Forrester, 1968, 1971) – most psychological research contributions consist of analyses of crucial partial aspects of the determinants of tax decisions and the interactions between taxpayers and tax authorities. Among the most researched effects are those of *justice* and *norms*. Verboon and van Dijke (2007) as well as Verboon and Goslinga (2009) emphasize that distributional justice may moderate selfinterest with respect to tax compliance, even if the personal norm for tax compliance is low (see also Wenzel & Platow, 2009).

Wenzel (2004a, 2007) pointed out that individual *identification with a group* is crucial for social norms to become internalized (Eckel & Grossman, 2005) and decisive for tax compliance. In a lab tax experiment, participants paid voluntarily more to private charity than to the government for the same purposes, with differences, among others, according the identification with a political party (Li, Eckel, Grossman, & Brown, 2011). Moreover, the deterrence effect of sanctions for tax evasion may be moderated by personal as well as social norms (Wenzel, 2004b). It is also important for taxpaying behavior whether the group norm is central to the social identity taxpayers share (Ashby, Haslam, & Webley, 2009). Bicchieri and Xiao (2009) argue that the obedience to a social norm depends on two dimensions of expectations: "empirical expectations" about what others will actually do and "normative expectations" as to what others think one should do.

Recently, the interaction between tax authorities and taxpayers came into the focus of psychological research. Generally speaking, there are three distinct features of the game between these players: the "cops and robbers" perspective (Kirchler, 2007, pp. 168 ff.), the "service-customer" view (Alm et al., 2010), and the "slippery slope" approach (Kirchler et al., 2008) which also might be dubbed the "power and trust" paradigm. A central aspect of this paradigm shift seems to be that behavioral control via external variables as auditing, control and detection probabilities, magnitudes of fines and imprisonment, is not necessarily very effective concerning tax compliance. Taking into account intrinsic factors as personal and social norms, fairness, justice and so on, might be much more successful – at a lower budgetary cost. Since a complex system of rules for taxes in general and particularly for the income tax require a high degree of voluntary cooperation to be effective, authoritarian method of enforcing tax compliance by threatening with coercive measures might be unproductive. The main reason may be that the "cops"-perspective renders all taxpayers to suspicious "robbers", i.e., tax dodgers. This view seems to be fundamentally unfair. However, procedural fairness (on its effect on "tax compliance" see Hartner, Rechberger, Kirchler, & Schabmann, 2008) requires even in a criminal case the presumption of innocence, unless proven otherwise. General suspicion reverses the first principles of fairness. As pointed out by van Dijke and Verboon (2010), trust in authorities is a precondition for procedural fairness of tax authorities to produce voluntary tax compliance. Otherwise, the threat of coercion might fail to be effective with respect to tax compliance (Murphy, 2004a). Put differently, the "climate" of taxpaying between tax authorities and taxpayers is decisive for high compliance levels (see Braithwaite, 2007; Braithwaite, 2009 for a "responsive regulation" approach).

Nonetheless, trust alone will presumably not bring about very high levels of tax compliance. The reason is the above mentioned "empirical expectation": without any threat of punishment cheating on taxes, the "empirical expectation" would be that almost all people will cheat (whether this is really correct or not). The expectation would induce a low level of tax compliance. Consequently, a reasonable level of power to enforce tax laws is certainly required. To signal cooperation on the side of tax authorities, a service–customer orientation would provide a credible signal to taxpayers that they are trusted beforehand and supported to abide by the tax law. As a conclusion, it might be argued that a service–customer orientation is an important ingredient for the 'power and trust' paradigm, given the complexity of contemporary tax laws.

The "slippery slope" approach mentioned above describes the dynamics of power and trust with respect to tax compliance. In this respect, it distinguishes between "voluntary" and "enforced" tax compliance: voluntary tax compliance relies on "trust", enforced compliance on "power" (Muehlbacher, Kirchler, & Schwarzenberger, 2011); high levels of tax compliance may then be realized by either high levels of coercion (i.e., control and punishment) or high levels of trust (i.e., support and communication) (Muehlbacher et al., 2011).

Perhaps the most crucial result of recent *experimental studies* is that although external (economic) variables as tax rates, detection and audit probabilities, etc., play a crucial role for taxpayers' compliance with the tax law, internal variables such as personal attitudes and motivations as well as social norms seem to be of similar significance (Hofmann et al., 2008).

Personal norms and personal ethics are preconditions of decision behavior; however, they are not necessarily always aware. Prinz and Krauskopf (2011) showed by decision time analysis of experimental data that most participants in laboratory experiments decided very quickly, which is interpreted as an automatic rather than a strategic decision-making on tax paying. Somewhat in contrast to that, Mead, Baumeister, Gino, Schweitzer, and Ariely (2009) found experimental evidence that cheating is more likely when a person's emotional resources for self-control are depleted. Hence it is an open question when and to what an extent moral behavior is automatically active or when it has to be activated by self-control. An experiment by Shu, Mazar, Gino, Ariely, and Bazerman (2012) revealed that signing a tax return-like form at the beginning of the form instead at the end enhanced honest reporting.

In addition to that, a so-called "dictator game experiment" demonstrated that it is what others do (i.e., "empirical expectations" according to Bicchieri & Xiao, 2009) and not what others think one should do (i.e., "normative expectations" according to Bicchieri & Xiao, 2009) which is dominant for decision making if both kind of expectations contradict each other. As a consequence, mis-expectations as well as misperceptions of what other (intend to) do play a role in tax compliance (Wenzel,

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2005). A result of experiments in Belgium, France and the Netherlands was, among others, that low tax compliance induced also less tax compliance with others while high compliance did not have an effect (Lefebvre et al., 2011).

As already said above, the so-called slippery slope-framework of tax compliance is one of the recent concepts to better understand the interaction between taxpayers and tax authorities (Kirchler et al., 2008). In several experimental studies, the influence of external (economic) as well as internal (psychological) variables on tax compliance is investigated. In Wahl, Kastlunger, and Kirchler (2010), it is shown that 'trust' and 'power' have different effects on paying taxes voluntarily and on enforced taxpaying, respectively: in the first case trust increases and power decreases taxpaying, whereas in the latter the reverse is true (see also Muehlbacher et al., 2011). Kastlunger, Lozza, Kirchler, and Schabmann (2013) differentiate between "coercive" and "legitimate power", with coercive power as "force, pressure and compulsion" (Kastlunger et al., 2013, p. 38) and legitimate power as "the authorities' efficacy to (due to its ability and expertise) ensure cooperation" (Kastlunger et al., 2013, p. 38) in an empirical investigation with Italian self-employed individuals. They find that coercive power subverts trust in contrast to legitimate power that enhances it (Kastlunger et al., 2013). Nevertheless, also severe sanctions may improve tax compliance when applied by the tax authorities in a fair manner (Verboon & van Dijke, 2011). These results demonstrate quite clearly why it is so difficult to find the right mix between the enhancement of cooperation between taxpayers and authorities, and strict law enforcement policies. Moreover, they also stress the importance of combining economic and psychological approaches to increase tax compliance.

The effects of tax audits in the "taxpaying life span" are investigated in Kastlunger, Kirchler, Mittone, and Pitters (2009); early experience of a tax audit increases compliance whereas tax compliance decreases when not audited over a longer period. Moreover, directly after an audit tax compliance decreases which may be interpreted as an attempt to regain the loss due to the previous audit (Kastlunger et al., 2009; Maciejovsky, Kirchler, & Schwarzenberger, 2007). In a certain way, this is a critical result for fighting tax evasion by auditing only. If after an audit tax evasion increases, the deterrent effect of the audit obviously fades away. But put differently, the result could also be interpreted as a hint to audit a person caught cheating on taxes over several periods.

In economic theory, a higher degree of strategic uncertainty contributes to higher levels of tax compliance (Alm, 1988; Alm, McClelland, & Schulze, 1992; Reinganum & Wilde, 1985; Scotchmer & Slemrod, 1989; Snow & Warren, 2005). The theoretical result was confirmed in an experimental setting in which a fixed-rate auditing probability was compared with an endogenously determined likelihood (Tan & Yim, 2013; for compliance behavior with an unknown audit rate see Santoro & Fiorio, 2011). Nonetheless, there are objections to apply the method in practice as, for instance, tactical behavior of taxpayers and tax practitioners may reverse the results concerning tax compliance (Osofsky, 2011).

Emotions do also play an important role in tax evasion; as it seems, they mediate between the procedural (un)fairness of tax authorities and compliance behavior (Murphy & Tyler, 2008) as well as they moderate the effectiveness of tax policies like audit probabilities and fines (Maciejovsky, Schwarzenberger, & Kirchler, 2012). Emotional arousal was found to be higher after audits with monetary penalties and more so when the person was pictured publically (Coricelli, Joffily, Montmarquette, & Villeval, 2010). In further experiments by Coricelli, Rusconi, and Villeval (2013), tax cheaters are publicly disclosed and fined with a "shaming ritual". When tax offenders were not socially reintegrated after the ritual, tax compliance decreased significantly (Coricelli et al., 2013). The social aspect of emotions was demonstrated in experiments where identifying participants' sympathy and promoting their empathy enhanced compliance (Calvet & Alm, 2013).

A further effect of emotions related to tax law offenders was found empirically in Australia (Murphy, 2008): "Stigmatic" or "reintegrative" perceived measures of the authorities can trigger feelings of "resentment" that have indicator quality for the further behavior of tax offenders. A "stigmatic" style of enforcement seemingly leads to "resentment" which makes relapses to tax evasion more likely (Murphy, 2008, p. 122). Ruedy, Moore, Gino, and Schweitzer (2013) report an "emotional rush" in people who behaved fraudulent that they dubbed the "cheater's high". As it seems, this is an instantaneous rush that competes with anticipated future feelings of shame and guilt if detected as a cheater. Psychologically, tax evasion is seemingly driven by 'emotional balancing' whereas it is determined in economics by 'cost-benefit balancing'.

Furthermore, there is also empirical evidence that the attitude to pay taxes plays a major role with tax compliance. A number of individual characteristics as well as social behaviors and social norms have been tested for their relevance. Of particular interest is that religiosity in general and church attendance in particular increase tax compliance (Prinz, 2004; Torgler, 2006) as well as patriotism (Konrad & Qari, 2012), social capital (Alm & Gomez, 2008) and other cultural factors (Alm & Torgler, 2006; Bame-Aldred, Cullen, Martin, & Parboteeah, 2011; Coleman & Freeman, 1997; Lago-Peñas & Lago-Peñas, 2010; Richardson, 2008; Torgler, 2003a; Torgler & Schneider, 2007; Tsakumis, Curtola, & Porcano, 2007). In contrast to these results, no differences of tax morale could be found between the catholic southern part of Europe and the protestant north (Kanniainen & Pääkkönen, 2010).

Also a number of demographic variables are related to tax compliance: among others, these are education, gender, age and income. First of all, there is no evidence for unambiguous educational effects on tax evasion and compliance; for instance, Wilson and Sheffrin (2005) did not find a connection whereas Chan, Troutman, and O'Bryan (2000) observed decreasing effects of higher education levels on tax compliance and Groot and van den Brink (2010), Kasipillai, Aripin, and Amran (2003) as well as Alarcón, Beyaert, and De Pablos (2012) detected a compliance increasing impact (see Goerke, 2012, for a theoretical explanation of these unclear results). McGee (2012a) emphasizes that the mixed results of empirical studies might be the outcome of a correlation of income and wealth with education. In the case of Spain, general education as well as actual knowledge of tax laws increased compliance in contrast to declared, but not actual knowledge (Alarcón et al., 2012). A survey with Australian graduates indicated that even the way of financing higher education may have an impact on the

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perception of the "legitimacy of the tax system" (Ahmed & Braithwaite, 2005, p. 291). Moreover, the perception of fairness of a tax may depend on tax knowledge as well as on its complexity, as was shown in a Malaysian study (Saad, 2010).

Torgler and Valev (2010) found strong empirical evidence for higher tax compliance of women in a cross-country study, although there are different results for some countries, too (McGee, 2012b). In an experimental setting, Kastlunger, Dressler, Kirchler, Mittone, and Voracek (2010) observed by differentiating between "demographic sex" and "gender-role orientation" that in both cases women and "less male-typical" persons complied better (see also Bazart & Pickhardt, 2011). However, Gërxhani (2007) points out with results from Tirana, Albania, that there are structural factors as, e.g., a dominance of public sector employment of women which might explain the differing tax compliance behavior of women and men.

Tax compliance seems to improve with age (McGee, 2012c; McGee & Smith, 2007). In contrast, there is in general no clear linear connection between income level and tax evasion; however, for some countries a connection can be found (McGee, 2012d). Nevertheless, tax compliance seems to be lower at low and high income levels than at middle incomes (the so-called Cox Paradox, Bloomquist, 2003, p. 2; Cox, 1984). Durham, Manly, and Ritsema (2013) report no interaction of income source and decision context, but they also found effects of the level of income, context and tax compliance in an experiment. In experiments of Anderhub, Giese, Güth, Hoffmann, and Otto (2001), tax evasion increased with the level of earned income (but not with the tax rate).

A rather unexpected result was found empirically for Italian households (for an estimation of income tax evasion in Italy see Marino & Zizza, 2012): honesty in paying taxes seemingly produced a non-pecuniary benefit in contrast to cheating on taxes (Lubian & Zarri, 2011). Although it might be often the case that virtue is its own reward, the question concerning this result is about the direction of causality: Are honest taxpayers happier or do happier people pay taxes more honestly? For instance, it is well-known in happiness research that married people are happier than other persons; however, checking causality by panel data revealed that happier people got married more often than less happy persons (Stutzter & Frey, 2006).

3.1.3. Agent-based models

The essential difference between agent-based tax evasion models and the neoclassical approach is the direct interaction among agents. That is, within the same model the behavior of an agent depends on the behavior shown by a specified peer group of other agents, usually denoted as neighbors. Moreover, the interaction process may not be market based, agents may not possess a utility function and tax evasion dynamics may be triggered by either parameter changes or by stochastic processes or a combination of both. Hence, agent-based tax evasion models are particularly apt for the modeling of tax evasion dynamics.

According to Pickhardt and Seibold (2013), agent-based tax evasion models may be categorized with respect to the interaction process, thereby falling into either the economics domain or into the econophysics domain. In the latter category, this process is driven by statistical mechanics, using a model structure that is known as the Ising model of ferromagnetism. Examples include Zaklan et al. (2008, 2009), Lima and Zaklan (2008), Lima (2010) as well as Pickhardt and Seibold (2013) and Hokamp and Seibold (2014). In these approaches, 'temperature' plays a key role. At first glance, this seems difficult to integrate in an economic or psychological theory; however, Ijzerman and Semin (2009) demonstrated experimentally that the physical temperature may be related to social proximity. However, whether warmer weather conditions and, hence, more social proximity, imply more or less tax evasion, remains nevertheless an open question.

If the interacting process is driven by parameter changes that induce behavioral changes via a utility function or by stochastic processes that are not related to statistical mechanics, these models belong to the economics domain. Examples include Mittone and Patelli (2000), Davis, Hecht, and Perkins (2003), Bloomquist (2004, 2011), Korobow, Johnson, and Axtell (2007), Antunes, Balsa, Respicio, and Coelho (2007), Szabó, Gulyás, and Tóth (2008), Szabó et al. (2009), Hokamp and Pickhardt (2010), Méder, Simonovits, and Vincze (2012), Garay, Simonovits, and Tóth (2012), Nordblom and Žamac (2012) as well as Hokamp (2013). Bloomquist (2006) offers a review of the first three models whereas Pickhardt and Seibold (2013) briefly review the remaining ones. In addition, the latter also compare and contrast the two domains into which agent-based tax evasion models fall.

In both domains most of the models mentioned above focus on the interaction dynamics that result from alternative enforcement scenarios by varying audit schemes or elements of the interaction process (for an overview of the settings in agent-based tax evasion models see Hokamp, 2012, chap. 2.3, pp. 20 ff.). Furthermore, many of these models consider the interaction of behaviorally different agent types as, for instance, random and strategic compliers or Kantians who always pay their taxes honestly. As pointed out by Gino, Ayal, and Ariely (2009), in experiments contagion of unethical behavior is a rather complicated process whereby, among others, social norms play a crucial role. Other aspects dealt with in agent-based models include the impact of back auditing (Antunes et al., 2007; Hokamp & Pickhardt, 2010; Seibold & Pickhardt, 2013), endogenous norm formation based on heterogeneous norm updating via several psychological mechanisms (Nordblom & Žamac, 2012), age effects, agent heterogeneity and public goods (Hokamp, 2013) or an entire shadow economy where firms and individuals may be involved in tax evasion (Szabó, Gulyás, & Tóth, 2008 2009). Bloomquist (2011) employs evolutionary dynamics to analyze tax evasion of heterogeneous business owners concerning tax morale; he calibrates the simulation model with results from lab experiments. As a result, about a third of previously honest business owners are replaced by other types after fifteen time periods (Bloomquist, 2011, p. 25).

Pellizzari and Rizzi (2013) construct a "citizenship" variable – consisting of the per capita level of public expenditures and its individual appreciation, risk aversion and compliance inclination as well as expectations on compliance behavior of peers – to build a "societal slippery slope" model. As a result of the simulations, "citizenship" is more decisive for aggregate tax

compliance than the usual enforcement methods, i.e., "power" (Pellizzari & Rizzi, 2013). This result is comparable to that of Barone and Mocetti (2011) who found that the efficiency of public spending plays a role for tax morale: in an Italian survey on the municipality level morale was higher the more efficient public spending was.

Occupation choices are the drivers of the dynamics in the social network model of tax compliance of Myles, Hashimzade, Page, and Rablen (2013): Taxpayers are heterogeneous with respect to risk aversion, talent for self-employment and their inclinations for honesty; the choice of occupation is determined by these characteristics. However, self-employment provides a wider range for tax evasion than other forms of employment. Group specific attitudes and beliefs are also endogenously formed via the structure of the agents' social networks which are used to communicate auditing and compliance information. As agent-based simulations demonstrate, taxpayer self-selection to occupations creates a connection between occupation and tax compliance (Myles et al., 2013).

Andrei, Comer, and Koehler (2013) emphasize the importance of the supposed network topology (for network topologies in general see Newman, 2010) in agent-based modeling of tax evasion. The network structure determines in which way tax behavior is transmitted in a society. For instance, networks with higher agent centrality tend to produce a higher level of tax compliance than models with lower levels of centrality.

To sum up, the authors find, among other things, that even low rates of enforcement may support a highly compliant society in the long run, that public expenditure can assure a positive relationship between the tax rate and tax evasion and that older people hold stronger moral attitudes (i.e. evade less taxes) than younger agents due to an age effect rather than a cohort effect.

3.2. Further subgames of the tax game

3.2.1. The strategic role of tax practitioners

The literature on the role of practitioners in the tax game concentrates on their informational role and on possible signaling effects their employment might have for the tax authorities. Dubin, Kalsow, and Udell (1998) describe two feasible roles of tax practitioners (compare also Erard, 1993; Jackson & Milliron, 1989): acting as an agent of the tax authority and acting as an agent for the taxpayer; in the latter role, two versions prevail: supporting taxpayers simply by preparing tax returns or supporting them with respect to tax avoidance and evasion (an encompassing decision-making approach of tax professionals is developed by Roberts, 1998). The theoretical results differ widely: Reinganum and Wilde (1991) find less tax compliance in equilibrium – although they took account of the pure service aspect of tax advising only – if the tax authority does not include penalty payments in its objective function. In contrast, Klepper, Mazur, and Nagin (1991) conclude that there may be two different situations: concerning unambiguous sources of income, taxpayers will be dissuaded from noncompliance; with ambiguous sources, noncompliance will be fortified. Franzoni (1998) emphasizes that collusion and cartelization of independent auditors are damaging. More recently, Gargalas (2010) criticizes the prevailing single-period models of tax practitioners and shows that in a multi-period framework the signing of tax returns by them might not be of any value as a signal for tax-payers or authorities; consequently, tax practitioners are employed because of their tax code knowledge.

There are also empirical and experimental results concerning the impact of tax practitioners on tax compliance. They are employed to save time–cost when filing a tax return and if a taxpayer is self-employed and the tax problem is more complex; however, the usage seems not to depend on income or the tax rate (Christian, Gupta, & Lin, 1993; for a recent study of demand determinants for tax practitioners' services see Fleischman & Stephenson, 2012). Moreover, with a high accuracy of practitioners' reports, inaccurate reports were relatively highly concentrated, according to a study with IRS data (Bloomquist, Albert, & Edgerton, 2007).

In a thorough and careful analysis of data from the U.S. Internal Revenue Service, Erard (1993, 1997) concluded that employing practitioners led to higher tax non-compliance. In addition to that, an empirical analysis of Australian data indicated a positive relation concerning tax compliance, but also that complying taxpayers responded to offered aggressive professional advice (Devos, 2012). However, aggressive taxpayers have in common a high interest in reducing their tax payments as much as possible (Murphy, 2004b). Hite and Hasseldine (2003) found that taxpayers employing tax practitioners are less likely to be audited and if audited, the tax is less often adjusted. Hite et al. (2003) could not assess unambiguous results concerning tax practitioners' aggressiveness, but pointed out that the professionals' behavior depends also on their own vulnerability.

An empirical questionnaire analysis in the U.S. confirmed an "expectation gap" between taxpayers using tax practitioners' services and the service providers as to what taxpayers want from them (Stephenson, 2006). In an Australian study, the dominant ideal type of tax consultants was of the "*low risk, no fuss*" variant (Sakurai & Braithwaite, 2003, p. 375; emphasis in the source). Moreover, in an earlier study it was found that the client-relationship as well as likely penalties for tax practitioners are also crucial factors for the behavior of the latter (Newberry, Reckers, & Wyndelts, 1993). Not surprisingly, experienced consultants seem to be more aggressive in their decisions than inexperienced ones (Koski & Ehlen, 2002). Moreover, clients tend to follow the advice of their advisers (Tan, 1999), and they are more likely to accept aggressive recommendations in a balance-due prepayment situation (Schmidt, 2001). Blanthorne, Burton, and Fisher (2012) find that it is not client pressure that induces aggressiveness; instead, higher levels of the professionals' moral reasoning are correlated with less aggressive reporting. In contrast, Bobek, Hageman, and Hatfield (2010) report experimental evidence that tax practitioners might be influenced unintentionally by client characteristics in their behavior. Changes in preparer penalties are used in a recent study on their effects on tax practitioners' recommendation and signing decisions (Hansen & White, 2012): higher penalties had no

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effect whereas a higher reporting standard reduced aggressiveness of recommendations as well as the willingness to sign aggressive tax reports. In a field experiment in the UK with different methods to increase tax compliance with small business owners by moral persuasion and / or threatening with penalties, the methods were generally more effective with self-preparers than with paid tax practitioners (Hasseldine, Hite, James, & Toumi, 2007).

All in all, although there exists a large literature on the behavior of tax practitioners, it remains still unclear as to what an extent they have an impact on tax evasion. For instance, they might be able to support and coordinate the cheating behavior of their clients; however, it is an unanswered question whether they wanted to do that, and if so, to what extent.

3.2.2. The role of the institutional framework

The institutional framework of taxation was considered crucial for the tax game particularly by the European School of public choice. Werner W. Pommerehne (Pommerehne, Hart, & Frey, 1994; Pommerehne & Weck-Hannemann, 1996), Bruno S. Frey, Lars P. Feld (Feld & Frey, 2002, 2007) and Benno Torgler (Bird, Martinez-Vazquez, & Torgler, 2008; Torgler, 2003b, 2005, 2007; Torgler, Schneider, & Schaltegger, 2010) provided not only new theoretical results, but also empirical and experimental evidence. The main insights of this approach may be summarized as follows: Trust between taxpayers and authorities is essential for very high levels of tax compliance (very low levels of tax evasion). The emergence of (bilateral) trust in this respect depends to a large extent on institutional and even constitutional factors as, e.g., the political influence of citizens on policies, the administrative unit that decides on public expenditures and public finances, the behavior of politicians in spending public money (the latter point is thoroughly emphasized by Tipke (2000) who differentiates between the 'morale of taxpayers' and the 'morale of taxation'; see also Alarcón & Tipke, 2007). The higher the level of citizen's impact on policies (see also Alm, Jackson, & McKee, 1993), the lower the administrative unit that decides on expenditures and taxes and the more honest politicians and bureaucracies spend public money, the higher the level of tax evasion (Alm et al., 1993).

In addition to directly tax-related features, also regulations in other areas may have an impact on the incentive and opportunity of tax evasion. Di Porto (2011) reports evidence concerning the "employer labor tax" in Italy and auditing: tax compliance and tax revenues might be affected adversely by it. The feasibility of employee labor income tax evasion in collaboration with employers when there are high marginal tax rates and high payroll taxes is shown with data from North Cyprus by Besim and Jenkins (2005). Moreover, Tonin (2011) demonstrates theoretically as well as empirically with data from Hungary that a statutory minimum wage may be employed to fight the evasion of a labor income tax (leaving aside other instruments to reduce tax evasion).

A promising new institutional tool to fight tax evasion and to increase tax compliance could probably be rewarding honest taxpayers, e.g., by participating in a lottery (Alm, Jackson, & McKee, 1992b; Andreoni, Harbaugh, & Vesterlung, 2003; Boadway & Sato, 2000; Falkinger & Walther, 1991). By increasing the opportunity costs of not complying with tax laws, the marginal cost of honesty is decreased; therefore it might be expected that more people behave honestly and comply with the tax law; moreover, even non-pecuniary rewards may be useful (Torgler, 2010). The latter method seems to be important because it does not lead to a loss of tax revenue.

It is a rather well-known experimental result in psychology that people react differently to potential gains and losses (see, for instance, Tversky & Kahneman, 1981). Kern and Chugh (2009) demonstrate experimentally that participants behaved more unethical in a loss frame than in a gain frame although the situations were identical. With respect to tax compliance, Bazart and Pickhardt (2011) found experimentally higher rates of tax compliance when fully compliant taxpayers could win money in a lottery. A gender effect could be detected since males had a higher propensity to tax evasion, but they also responded stronger to the reward than females (Bazart & Pickhardt, 2011). Although in another reward experiment by Kast-lunger, Muehlbacher, Kirchler, and Mittone (2011) no effect on compliance could be found, rewards triggered seemingly a more pronounced all-or-nothing decision concerning tax cheating. After all, although rewarding fully complying taxpayers with a chance to win money in a lottery is a challenging theoretical idea, it is not clear which effects it would provoke in practice.

4. Discussion

It is no exaggeration to say that research on tax compliance as well as tax evasion over the decades has shown that the dictum of Schumpeter holds true: "Psychology is really the basis from which any social science must start and in terms of which all fundamental explanation must run" (Schumpeter, 1954, p. 27). The reason is that without taking account of psychological insights into taxpayers' behavior, it could not be understood why people pay taxes with very low detection probabilities for tax fraud and why these probabilities are more important to deter tax evasion than the size of the penalties. Economic theory, on the other hand, provides a toolkit for *formalizing* tax compliant and tax evading behavior (see also Simon, 1967, for the relevance of psychology for economics as well as of economics for psychology). With the rational choice model of the economics of crime, or shortly SMORC, the formal analysis of tax evasion became possible, and empirically testable hypotheses could be stated. Moreover, the formal model of rational choice is quite well-suited for incorporating psychological factors to analyze more adequately taxpayers' decisions. As it seems, the different approaches to the phenomenon of tax evasion and compliance are rather complements to each other than competitors. Recently, agent-based models from computational economics as well as from computational physics (econophysics) have expanded the spectrum of research

methods. Since these methods are computer-based, it is possible to run computer simulations of large populations with different topologies of networks, groups and so on. Agent-based modeling enables researchers to conduct experiments in virtual societies with respect to tax evasion and compliance. Since social interaction among taxpayers is considered crucial for tax evasion as well as for compliance, these tools may be employed to analyze their dynamics in a large society with specified social infrastructures. Moreover, to calibrate these simulation models, results from empirical as well as experimental studies can be used.

According to Dan Ariely (2012), p. 27, our behavior is generally driven by a conflict between seeing one-self as an honest person on the one hand and the financial benefits from cheating on the other hand. Rationalization is considered as a process that balances these major drivers of behavior (Ariely, 2012, p. 27; Mazar, Amir, & Ariely, 2008). The psychology of tax evasion would then be to a large extent a theory of rationalizing tax (non)paying. Fig. 2 demonstrates a general integrative theory of tax evasion and compliance based on both economics and psychology.

In this figure, Cressey's (1953) 'fraud triangle' is combined with the Mazar et al. (2008) and Ariely (2012) approach which is called here 'fudge triangle' (see Ariely, 2012, p. 27, who dubs his approach "fudge factor theory"). The fraud triangle implies that the inclination to (tax) fraud depends on three factors: the incentive to cheat, the opportunity to commit fraud and the attitude/rationalization of fraudulent behavior (see also Trivedi, Shebata, & Mestelman, 2005). In contrast to the fraud triangle, the SMORC as well as the ASY model assume that an incentive (to gain monetary benefits) and the opportunity (to cheat, e.g., to hide income) suffice to explain fraudulent behavior. Ariely's (2012) fudge triangle supposes a conflict between honesty (to maintain a certain self-concept, Mazar et al., 2008) and financial benefits from cheating, with rationalization as a process to balance these contradictory personal goals (Ariely, 2012, p. 27). The conflict between honesty and financial benefits is dubbed here the "Simple Model of Emotional Balancing" (SMOEB). In addition to these triangles, social and personal norms are also included in this integrative model of tax behavior. This means that both triangles are embedded in a person's own normative framework. To complete the theory, external influences on social and personal norms as well as on the fraud and the fudge triangle are determined. On the one hand, social institutions as, e.g., tax laws and tax authorities, are identified as external drivers of the tax interactions; on the other hand, personal networks are considered as the most crucial moving power of social and personal norm development.

However, there are also severe limits to study clandestine activities like tax evasion. None of the methods mentioned above is well-suited to overcome these restrictions. One consequence is a lack of valid and reliable data. Without these data, theoretical reasoning cannot be tested sufficiently. Insofar our knowledge and understanding of tax evasion and compliance is still very fragmentary and, hence, incomplete. As it seems, there are no methods in sight that could provide the required data. Only field experiments may help to some extent: theoretically motivated tools to encourage tax compliance could be implemented on a small scale to learn more about taxpayers' compliance behavior.

Another unclear spot in tax compliance is the role of tax practitioners. Since they are paid by their clients, i.e., individual or firm taxpayers, they will serve them by providing tax law information and services as well as by supporting taxpayers against tax authorities. The background of the conflicting interest of taxpayers and tax authorities is obviously the tax laws. This brings even tax lawmakers into the game as the quality of the tax laws is also a crucial ingredient for tax compliance. Complicated and unclear tax laws may provide incentives to employ more tax practitioners, but this not necessarily so. Complicated and unclear tax laws may even facilitate tax evasion as it becomes probably more difficult for tax authorities to prove their case.

Another topic which lacks research is the role of banks and other asset administrators in tax evasion. Particularly the assistance of these institutions with respect to tax evasion is of relevance here. Concealing money from taxation as well as bringing it back into the economic circuit requires some special capabilities. Moreover, the more often such transactions are performed, the lower the costs may become due to economies of scope and scale.



Fig. 2. An integrative model of tax evasion and compliance.

A further aspect seems noteworthy. To conceal crimes, taxes may be paid on income that actually does not exist, as was, for instance, the case in the Madoff investment fraud (see Kramer & Ward, 2009, for tax issues of "phantom income"). Cheating *on* taxes is replaced here by cheating *with* taxes, as it were. Investment fraud and money laundering might be accompanied by paying taxes on non-existing profits. Not much is known about that as well as about "*large-scale intentional fraudsters*" (Levi, 2010, p. 493, in italics in the source) in general.

5. Conclusion

In this paper, the focus is on the behavioral dynamics of tax evasion and compliance. From the viewpoint of the integrative model of tax evasion and compliance provided in Fig. 2, research on all elements is found in the papers reviewed here. A crucial lesson is as follows: Although personal traits of taxpayers are more or less unchangeable, personal and social norms as well as rationalizations can be influenced by interactions with others. For instance, if tax evasion becomes a widely spread phenomenon, it will be difficult to enforce tax laws. This means that interactions between taxpayers, taxpayers and tax authorities as well as taxpayers and tax practitioners, as depicted in Fig. 1, are crucial for the dynamics of personal attitudes, norms and rationalizations.

Surveying the recent literature with respect to these interaction dynamics revealed a multiplicity of approaches from (i) economic theory to psychological research to (ii) empirical and experimental results and, finally, to (iii) agent-based modeling by methods from economics and econophysics. The multiplicity of approaches is not incidental. The reason is that it is rather difficult to shed light on such a complex phenomena like tax evasion and compliance. The approaches are found to be complementary, although they compete among each other for relevance. However, from the viewpoint of tax enforcement policy the most import lessons to be learned from recent research are as follows: (a) Tax enforcement by considering all tax-payers as potential tax cheaters and, hence, employing mainly instruments to deter tax evasion by audits and punishment, seems no longer adequate since it might decrease voluntary tax compliance. The reason is that many citizens pay their share of the public good without force. This source of compliance might be eroded if these citizens are treated as potential tax evaders. (b) Although a certain number of audits and punishment is required to deter tax fraud, measures to encourage people to pay taxes voluntarily are needed. To this end, simpler tax codes, more service-oriented tax authorities and a kinder attitude of tax authorities to taxpayers seem very helpful. Trust is the main ingredient for cooperative tax behavior. (c) If tax authorities distrust people, taxpayers seem to mirror this attitude and start to distrust tax authorities, too. In such a climate, voluntary tax compliance will suffer. To restore it is a difficult and perhaps expensive business.

Although our knowledge of tax evasion and compliance has increased a lot since the 1970s, there are nevertheless several blind spots remaining. The first one to be mentioned here is the lack of field experiments. Within the laboratory, people may react differently than in real-life situations. Moreover, since participation in experiments is voluntary, a selection bias cannot be excluded. Field experiments are expensive; however, to find tax policy instruments that are implementable with more certainty concerning their effectiveness, such experiments seem indispensible.

Another blind spot is the role of financial institutions with respect to tax evasion. In evading capital income taxes and capital gains taxes, financial institutions are seemingly playing a crucial role. Not much is known about that on a scientific level. Furthermore, it is not clear how this kind of support for tax evasion could be fought effectively as well as efficiently.

To sum up, although we know now a lot more about tax evasion and compliance, we are far away from knowing it all. Further research is required.

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Please cite this article in press as: Pickhardt, M., & Prinz, A. Behavioral dynamics of tax evasion – A survey. *Journal of Economic Psychology* (2013), http://dx.doi.org/10.1016/j.joep.2013.08.006

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