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Kay Blaufus, Malte Chirvi, Hans-Peter Huber,
Ralf Maiterth, Caren Sureth-Sloane

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Kay Blaufus
Leibniz University Hannover
blaufus@steuern.uni-hannover.de

Malte Chirvi
Humboldt University of Berlin
malte.chirvi@wiwi.hu-berlin.de

Hans-Peter Huber
Humboldt University of Berlin
h-p.huber@wiwi.hu-berlin.de

Ralf Maiterth
Humboldt University of Berlin
ralf.maiterth@wiwi.hu-berlin.de

Caren Sureth-Sloane[*]
Paderborn University
Department of Taxation, Accounting and Finance and
Vienna University of Economics and Business
caren.sureth@upb.de

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[*] Corresponding author: caren.sureth@upb.de
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Tax Misperception and Its Effects on Decision Making – Literature Review and Behavioral Taxpayer Response Model

Abstract

Previous accounting research shows that taxes affect decision making by individuals and firms. Most studies assume that agents have an accurate perception regarding their tax burden. However, there is a growing body of literature analyzing whether taxes are indeed perceived correctly. We review 127 studies on the measurement of tax misperception and its behavioral implications. The review reveals that many taxpayers have substantial tax misperceptions that lead to biased decision making. We develop a Behavioral Taxpayer Response Model on the impact of provided tax information on tax perception. Besides individual traits, characteristics of the tax information and the decision environment determine the extent of tax misperception. We discuss opportunities for future research and methodological limitations. While there is much evidence on tax misperception at the individual level, we hardly find any research at the firm level. Little is known about the real effects of managers' tax misperception and on how tax information is strategically managed to impact stakeholders. This research gap is surprising as a large part of the accounting literature analyzes decision making and disclosure of firms. We recommend a mixed-method approach combining experiments, surveys, and archival data analyses to improve the knowledge on tax misperception and its consequences.

Keywords: Behavioral Taxation; Business Taxation, Misperception, Real Effects, Tax Perception; Tax Policy

JEL: M41 · H24 · H25 · D91

1 Introduction

In this paper, we review and evaluate the research on tax misperception and its effects on decision making. Previous accounting research provides evidence that taxes significantly influence decision making, including decisions on investment and financing. Most of this work is based on the assumption that individual and firm decision makers can form rational expectations about the tax consequences of their choices. However, taxation is highly complex, taxes are often not salient, and in many cases agent behavior is influenced by framing effects. It is therefore unclear whether economic agents understand the tax consequences of their decisions. With the rise of behavioral economics in the last two decades, tax researchers have also intensified their work on tax misperception and its effect on economic decisions. This study aims to review this research from its beginnings in the late 1950s to the present.

In total, we present and discuss 127 mainly empirical studies that measure the extent of misperception regarding income, wealth, and excise taxes in different countries, or examine the effects of tax misperception on taxpayers' decision making. In the literature, different terms are used for what we refer to as misperception. Some authors use 'misconception' and others 'biased beliefs'. We consider all of these terms synonymous and in the following uniformly refer to 'misperception'.

The reviewed studies which measure individuals' tax perception by surveying taxpayers reveal substantial tax misperception. However, findings on the degree and the direction (under- versus overestimation) of misperception are inconclusive, and it remains unclear where the differences originate. Another shortcoming of these studies is that they do not analyze behavioral effects of tax misperception. In contrast to research on individuals' tax misperception in several countries, studies on firms are scarce and cross-country studies do not exist at all. Also, the role of tax-related accounting information on individual and corporate tax misperception and its impact on decision making is underexplored. This research gap is surprising as much of the literature in accounting and finance analyzes decision making of firms.

Further, we review a body of mainly experimental literature on tax perception and behavioral response. Studies in this field show that even if accurate tax information is provided, taxpayers often do not incorporate taxes into their decision making in a way predicted by rational choice theory. It is also shown that misperception of tax facts, e.g. due to tax complexity or lack of salience, results in distorted decisions. A potential weakness of these real effects studies is that they do not identify tax misperception directly. Rather, they identify tax misperception via behavioral response and infer that these responses are induced by tax misperception.

Finally, we review studies that deal with the management of others' tax perception. There are few studies, but they indicate that corporate tax information is strategically managed to impact stakeholders' perception.

To develop well-targeted tax regulations and understand the underlying biases of taxpayers, both tax misperception and its implications need to be explored carefully. In doing so, the following two questions have to be addressed: (1) Do economic agents misperceive taxes? (2) Do these misperceptions translate into distorted decisions?

In sum, our study contributes to tax-related accounting research in three ways. First, we provide the first comprehensive overview of research on tax misperception and its effects on individual and corporate decisions including the management of tax perception.[1] In the online appendices, we provide one summary table each for Section 3 (Table A1: Tax Misperception), Section 4 (Table A2: Effects of Tax Misperception on Decision Making) and Section 5 (Table A3: Management of Tax Perception and its Impact on Stakeholders). These tables present the methodology, research question, and results of the reviewed articles and enable researchers to quickly assess the respective topics and approaches. Second, based on our review of prior research, we develop a *Behavioral Taxpayer Response Model* that illustrates the impact of the type and character of provided tax information on tax perception, whether and how the non-tax environment and individual traits moderate this relationship, and how the resulting tax perception translates into decisions. The model helps researchers to develop and define their own research questions and to derive behavioral predictions. Third, we discuss methodological challenges of the research stream and identify research gaps and avenues for future research.

Identifying and scrutinizing misperception and behavioral responses to tax information by individuals including entrepreneurs and corporate managers not only contributes to tax research, it also provides novel insights for related fields in accounting research, such as real effect studies with respect to all kinds of accounting information. Thus, we contribute to the sender-receiver paradigm of accounting information and how information that is processed and perceived by receivers translates into real effects. Stakeholders' exposure to biased and unbiased accounting information and their respective responses to voluntarily and mandatory disclosed information on firms and compensations

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[1] The only other related literature review we are aware of is Fochmann et al. (2010). However, the authors focus only on six specific strands of the literature: (1) perception of marginal tax rates, (2) influence of tax complexity on tax perception, (3) taxation and work incentives, (4) tax salience, (5) tax morale and fairness and (6) money illusion. Strands (5) and (6) are not included in our study. As far as there is an overlap in (1) to (4), we expand and update the study considerably. Moreover, we explicitly exclude behavioral research on tax compliance (see for a review, e.g., Kirchler, 2007 and Alm, 2019).

is also likely to be distorted because of cognitive and behavioral aspects when processing this information or due to misperception of the regulatory environment. Real effect studies will benefit from our study by a deeper understanding of potential misperception and further behavioral frictions.

2 Selection Strategy and Overview

The survey is based on a literature search in the databases EBSCO, JSTOR, ScienceDirect, and Google Scholar. The survey consists of three parts. In Section 3, we focus on studies that identify tax misperception of both individuals and corporations by asking taxpayers directly about their tax perception. To provide overview of these studies, in our queries we use keyword combinations of perception ('assessment', 'beliefs', 'bias', 'misconception', 'misperception', 'perception', 'salience') and the tax type ('capital tax', 'corporate tax', 'estate tax', 'excise tax', 'income tax', 'inheritance tax', 'property tax', 'sales tax', 'value added tax', 'VAT', 'wealth tax'). Moreover, to search studies on perception of tax-related accounting information, we use keyword combinations of perception and 'tax disclosure', 'tax reporting', 'tax transparency', 'analyst', 'investor', 'management', and 'manager'. In Section 4, we review studies that infer tax misperception from observed real behavior. We use keyword combinations denoting tax misperception ('tax bias', 'tax misperception') and behavioral decisions ('avoidance', 'consumption', 'financing', 'investment', 'real effort', 'planning', 'saving'). Furthermore, we survey studies on corporates' tax perception management in Section 5. We use keyword combinations of 'tax' and 'disclosure', 'discretion', 'media', 'political costs', 'transparency', and 'reporting'. This search strategy results in a total set of about 430 papers.

After selecting studies with a clear focus on identification of tax misperception and its effect on decision making or tax perception management, we obtain a final set of

127 mainly empirical studies (Section 3: 54 studies, Section 4: 65 studies and Section 5: 14 studies). Table 1 lists all surveyed studies grouped by methodology over time.

<Insert Table 1 about here>

Interestingly, although research on tax misperception began more than sixty years ago, the majority of studies date from after 2000. As in other economic areas, this is due to the increasing importance of behavioral economics in tax research in the last two decades. Moreover, Table 1 reveals that most studies that identify tax misperception use a survey design, real effect studies use an experimental approach, and studies on tax perception management analyze archival data.

3 Tax Misperception

In this section, we review studies which measure individual and corporate tax misperception. Table A1 (see online appendices) provides information on the underlying research question, the research design and the results of each of the reviewed articles. This overview also offers information on the underlying tax type, country, subject pool, sample size and year.

3.1 Individual Tax Misperception

Many studies measure individuals' misperception by asking respondents to estimate income tax burdens and benchmarking reported against actual numbers. Measuring tax burden misperception encompasses three aspects.

First, researchers have to decide on the *kind of tax burden* of interest. If one studies people's attitudes towards the fairness aspects of taxation, the *average tax burden* or *average tax rate (ATR)* is relevant. If the tax burden on additional income is of interest, which is particularly relevant for decision making, the *marginal tax burden* or *marginal tax rate (MTR)* matters.

Second, the *scope of tax burden* has to be determined. Is it respondents' own tax burden or that of other taxpayers? In the latter case benchmarking is easy, since the actual tax burden can be precisely determined based on income figures provided to respondents. By contrast, benchmarking respondents' own tax burden is more challenging. Using respondents' tax return data is regarded as the 'gold standard' (Gideon, 2014, p. 1). However, as this data is often not available the actual tax burden has to be calculated based on income reported by respondents. Moreover, even if tax return data were available, it would only contain backward-looking information, while forward-looking information is necessary for decision making.

Third, the *distribution of misperceptions* has to be analyzed. What is the share of respondents who over- or underestimate tax burdens and how many respondents are not able to give estimates at all?

3.1.1 Perception of Average Income Tax Rates (ATRs)

'ATR studies' aim, in particular, to identify the effect of misperception on taxpayers' attitudes towards the fairness and distributional implications of the tax system. The majority of these studies is interested in respondents' own tax burden. Schmölders (1960) pioneered this field.[2] Using benchmarks that rely on reported incomes, he finds that about one third of respondents report accurate tax burdens. For the others, overestimates considerably outnumber underestimates. The percentage of overestimates is particularly high among farmers, freelancers and sole proprietors (>50%) compared to civil servants (35%) and employees (40%). Enrick (1963, 1964) uses benchmarks based on tax return information and finds that only about 5% of respondents rate their tax burden accurately. The others tend to underestimate rather than overestimate their tax bill. Van Wagstaff (1965)

[2] The original study by Schmölders is only available in German. However, some parts of his work on fiscal psychology have been translated into English (Schmölders, 2006).

uses employer payroll records for benchmarking and reports a substantial dispersion of respondents' estimates, whereby under- and overestimates are almost balanced. 13% of respondents accurately assess their tax burden. Auld (1979) uses reported income for benchmarking and finds that low-income respondents overestimate, higher-income respondents underestimate and middle-income respondents almost accurately estimate their tax burden. Gideon (2014, 2017) uses reported income for benchmarking and shows, on average, an overestimation of ATRs across the income distribution. Ballard and Gupta (2018) also benchmarked based on reported income and found that over 20% of respondents do not know their ATR. The vast majority of the remaining respondents overstate their ATR; the variety of misperceptions is extremely pronounced.

Three papers focus on misperception of ATRs for different income levels. Williamson (1976) shows that respondents, on average, significantly overestimate ATRs for each given income category. Overestimates und underestimates for low and high incomes differ according to respondents' income. Blaufus et al. (2015) provide evidence that nearly 50% of respondents report accurate ATRs. The remainder misperceive ATRs significantly, with ATRs for high (low) income underestimated (overestimated). Rees-Jones and Taubinsky (2019) show that respondents overestimate ATRs on average and perceive the tax schedule to be more linear than it actually is. However, there are also many respondents who underestimate ATRs.

In sum, the discussed papers show that a significant number of taxpayers are not able to accurately estimate either their own ATR or the ATR of other income levels. Moreover, most studies indicate a tendency to overstate the ATR, on average, although the direction of misperception seems to depend on the income level.

3.1.2 Perception of Marginal Income Tax Rates (MTRs)

Not surprisingly, beliefs about MTRs have been examined more often, reflecting that the main focus of tax research is on the tax effects on decision making. Gensemer et al. (1965) pioneered this field. They focus on MTRs of high-income earners and establish benchmark MTRs based on reported income. They provide evidence that more than a quarter of respondents are not aware of their MTRs but do not provide further information on the extent or direction of MTR misperception. C. V. Brown (1969) derives benchmark MTRs from employers' payroll records and finds that only one fifth of the surveyed workers and nearly one third of the surveyed managers report accurate or roughly accurate MTRs. He observes far more overestimates than underestimates in both groups of respondents. Fujii and Hawley (1988) use reported income to derive benchmark MTRs and find that about one third of respondents are not able to guess their MTR. The others underrate their MTR, on average, only slightly. Further information such as the share of respondents over- or underestimating their MTR is not provided. Rupert and Fischer (1995) use tax return information for benchmarking and ask respondents for absolute numbers rather than percentages. Over 90% of respondents report misperceived MTRs, with overestimation twice as common as underestimation. Gemmell et al. (2003, 2004) do not ask respondents to give precise MTR estimates but to select one out of five given 'additional tax burden classes' and benchmark the responses based on reported income. Due to this rather rough measure, it is not surprising that the authors report a rather high level of accurate estimates at over 30%. The remaining respondents exhibit a bias towards an overestimate although many respondents report underestimates, too. Hundsdoerfer and Sichtmann (2009) explore a subject pool of practicing physicians. They compare the mean of MTRs reported to the corresponding average MTR calculated on the data of the official German income tax statistics and find both numbers are equivalent. However, an in-depth analysis shows that about one quarter of participants report MTRs that do not exist. Gideon (2014, 2017) benchmarks against MTRs computed on reported income and finds fairly accurate reported MTRs, at the mean, but estimates exhibit substantial heterogeneity. Individuals at lower income levels overestimate their MTR, whereas higher-income individuals underestimate MTR. Blaufus et al. (2015) use reported income for benchmarking and demonstrate that respondents misperceive their MTR more than their ATR. Moreover, taxpayers tend to underestimate (overestimate) the MTR for higher (lower) income levels. One in six respondents mistakes ATRs for MTRs. The widespread use of ATRs instead of MTRs is also confirmed by Bartolome (1995) in an experimental setting. Similar, Rees-Jones and Taubinsky (2019) find that taxpayers use their ATR rather than their MTR.[3]

Lewis (1978) is, to the best of our knowledge, the only study on the perception of other individuals' MTR, finding a uniform underestimate by about 10% for each income bracket and less misperception for MTRs that are close to respondents' income bracket. Approximately 10% of respondents fail to provide MTR estimates at all.

There is also some literature on misperception of income tax progressivity. Slemrod (2006) shows that the majority of respondents favor switching to a flat-rate income tax because they misperceive the current system being regressive.[4] Gideon (2014, 2017) finds that only slightly more than one fifth of respondents understand tax schedule progressivity to mean that MTRs are higher than ATRs. Rees-Jones and Taubinsky (2019) show that progressivity in the U.S. income tax code is underestimated since the perceived income tax schedule is more linear than the actual schedule.

In sum, similar to the findings regarding ATR perception, research shows that many taxpayers know neither their own MTR nor MTRs related to other income levels. Over- as well as underestimations of the MTR are observed which tend to depend on the

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3 Using average instead of marginal figures is not tax specific (see Shin (1985) for electricity demand and Faulhaber and Baumol (1988) for pricing decisions).

4 However, beliefs on tax evasion among high-income individuals (Bakija & Slemrod, 2004, p. 69, provide evidence for the existence of these beliefs) proved to be not statistically significant.

income level. Moreover, some taxpayers mistake ATRs for MTRs which leads to an underestimation of the MTR given a progressive tax schedule.

3.1.3 Perception of Other Taxes

While most of the literature focuses on income tax misperception, there is also some evidence for other taxes. One example is the U.S. estate tax. The frequently cited studies by Bartels (2005) and Slemrod (2006) refer to a survey in which half of respondents state that they believe ‘most families’ are hit by the estate tax. In fact, at best only about 2% of all deaths actually led to an estate tax liability. Similar results are found by Kuziemko et al. (2015), Sides (2016) and Chirvi and Schneider (2020). For Germany, Bischoff and Kusa (2019) show that 51% of respondents wrongly believe that a child who inherits €100,000 has to pay inheritance tax.

Cabral and Hoxby (2012) analyze the salience of the U.S. property tax and show that homeowners with tax escrow perceive their property tax less accurately than those who write property tax checks to local government. However, the share of those who under- and overestimate is similar in both groups of homeowners.

Regarding excise taxes, a survey by TNS Opinion & Social (2015) demonstrates that only 65% of individuals in the EU are aware of the standard VAT rate in their country. Chetty et al. (2009) as well as Taubinsky and Rees-Jones (2018) find similar results for the U.S. Ferber (1954) finds a rather inaccurate perception of *changes* in excise taxes on theatre tickets, cars, luggage, shoes, and refrigerators. For the U.K., Gemmell et al. (2003, 2004) analyze how individuals perceive the extra burden on household expenses that results from a one percentage point increase in the VAT rate and find that respondents tend to overestimate the additional burden.

Fisher and Wassmer (2017) show that respondents overestimate the gasoline tax and hence the gasoline tax burden of an average driver in their respective state. Related to Cabral and Hoxby (2012) on different property tax payment channels, Finkelstein (2009) finds that car drivers who pay their road tolls in cash, on average, perceive toll payments significantly more accurately than electronic toll collection users.

In sum, this section shows that tax misperception is not limited to income taxes but is also substantial in regard to other taxes such as consumption and wealth taxes.

3.2 Corporate Tax Misperception

In contrast to studies on individuals, research on corporations' tax perception is scarce.[5] Graham et al. (2017) provide evidence that corporate managers confuse average and marginal corporate tax rates in decision making. The authors ask tax executives of U.S. corporations on the primary tax rate they use in various business decisions and let the participants choose from *'(1) U.S. statutory tax rate (STR), (2) GAAP effective tax rate (ETR), (3) jurisdiction-specific statutory tax rate, (4) jurisdiction-specific effective tax rate, (5) marginal tax rate, and (6) other*' (p. 3139). The most frequent answer of private firms is 'U.S. statutory tax rate' (34.1%), whereas public firms most frequently report 'GAAP effective tax rate' (27.4%). Only 12.5% (10.8%) of private (public) firms use the MTR, which is appropriate for decision-making.

Several studies examine whether corporate managers, investors, and financial analysts perceive tax-related accounting information accurately. Financial reporting is aimed at improving the information environment and reducing misperception. However,

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5 Some earlier studies written in German are at least loosely linked to tax perception. These studies find that the majority of surveyed German corporations do not properly incorporate taxes in their investment decisions (Hüsing, 1999; Kling, 1992; Schwenk, 2003; Wittmann, 1986). A closely related study by Dietrich et al. (2008) analyzes how Swedish firms perceive the tax burden associated with foreign direct investments (FDI) in Austria relative to Germany.

tax accounting rules are complex and require an understanding of both tax law and financial accounting. Thus, processing tax-related information is costly and it is therefore reasonable that misperception of tax-related accounting information might occur.

Bratten et al. (2017) study misperception of tax-related accounting information and find that the accuracy of managers' ETR forecasts decreases when GAAP ETRs include discrete items (e.g., transitory gains and losses or settlements with tax authorities) or when tax rate complexity (capturing absolute changes in ETR, the absolute difference between the statutory tax rate and the ETR, and ETR volatility) is high. Moreover, Gleason et al. (2018) demonstrate that managers' estimates of additional tax liabilities due to tax audits are, on average, inaccurate. Eberhartinger, Speitmann, Sureth-Sloane, and Wu (2020) find in a laboratory experiment evidence that both trust in government and interpersonal trust affect the bargaining behavior of taxpayers and auditors and thus the outcome of tax audits.

Research regarding tax misperception of financial analysts has identified significant errors in forecasts in face of changes in tax law or tax accounting standards. Plumlee (2003) finds that the magnitude of errors in ETR forecasts increases with the complexity of tax law changes. K. C. W. Chen et al. (2003) report that a one-time deferred tax adjustment (due to an increase in the corporate tax rate) is incorrectly interpreted as a recurring item. Hoopes (2018) find increasing earnings forecasts errors when a temporary R&D tax credit regulation expires. Brushwood et al. (2019) show that the early adoption of a new rule on tax accounting of stock-based compensation reduces the accuracy of analysts' ETR forecasts. In addition, research indicates that analysts make more errors in forecasting earnings of firms with tax loss carryforwards (Amir & Sougiannis, 1999) or with high book-tax differences (D. P. Weber, 2009). Also, they less accurately forecast tax expenses, pre-tax earnings and ETRs when the reported ETR includes discrete items or when tax rate complexity is high (Bratten et al., 2017). Finally, analysts' ETR forecasts are more accurate for firms that present ETR reconciliation information in percentage format rather than in dollar format (Chychyla et al., 2017). Overall, this research demonstrates significant tax misperception by financial analysts. On average, forecasting tax-related information seems to be more difficult for analysts than forecasting other accounting information, as shown by Kim et al. (2020). However, Bratten et al. (2017) show that analysts' ETR forecasts are more accurate than managers' forecasts if tax rate complexity is high.

Although financial analysts also suffer from tax misperception, there is evidence that their forecasts may still help investors to better incorporate tax-related information. Investors seem to misperceive value-relevant information reflected in tax expense items and therefore underreact to information on tax expense surprises (Thomas & Zhang, 2011). However, this mispricing of income tax expense is reduced if tax expense forecasts of analysts are available (Baik et al., 2016).

While many countries have recently adopted policies to increase corporate tax transparency, it is unclear whether this has improved the accuracy of tax perception. For example, Gleason et al. (2018) find that the introduction of FIN 48, a US GAAP regulation that requires businesses to disclose income tax risks, does not improve managers' forecasts regarding necessary tax reserves, it at least improves the comparability of tax-related accounting information. However, Robinson et al. (2016) show that firms are over-reserved for uncertain tax positions after the introduction of FIN 48, and that FIN 48 reduces the relevance of tax-related accounting information. Research on IFRIC 23 (an IFRS regulation that serves a similar purpose as FIN 48 and is mandatory since 2019) is to the best of our knowledge not yet available.

Another example of recent policies to increase corporate tax transparency is (public) country-by-country reporting (CbCR). Several studies investigate both public and non-public CbCR and its real effects (R. J. Brown, 2018; De Simone & Olbert, 2019; Dutt et al., 2019; Eberhartinger, Speitmann, & Sureth-Sloane, 2020; Joshi et al., 2020; Overesch & Wolff, 2017). While it is known that the information disclosed through CbCR is potentially misleading (Lagarden et al., 2020) none of these studies scrutinizes the extent to which misperception impedes transparency and generates undesired implications.

Finally, research on misperception of tax-related accounting information reveals a link to research on tax uncertainty (e.g., Dyreng et al., 2019; Hanlon et al., 2017; Jacob et al., 2019; Jacob & Schütt, 2020). Making accurate estimates of uncertain tax items is a challenge yet crucial for decision making. In archival studies, tax uncertainty is often measured by ETR volatility (for an overview of such tax risk measures, see, e.g., Blouin, 2014). Increasing ETR volatility is positively associated with forecast errors of tax-related accounting information (Bratten et al., 2017). Thus, tax uncertainty may be another source of tax misperception. In addition, tax misperception caused, for example, by tax complexity may be another reason for more perceived tax uncertainty by investors. In line with this reasoning, Bratten et al. (2017) find that complexity increases the dispersion of analysts' ETR forecasts, and forecast dispersion is commonly interpreted as reflecting uncertainty. Hoppe et al. (2020) provide a measure of perceived tax complexity in the tax code and framework as faced by multinational corporations. Their survey-based multidimensional Tax Complexity Index captures tax uncertainty as one dimension of perceived tax complexity.

In sum, the discussed papers show that corporate tax misperception seems a prevalent phenomenon. However, research on corporations' genuine tax misperception is scarce. In addition to the provisions of tax law, tax-related accounting disclosures may also induce tax misperception, especially if tax uncertainty and complexity are high.

4 Effects of Tax Misperception on Decision Making

4.1 Effects of Individual Tax Misperception on Decision Making

The previous section has shown that many taxpayers misperceive their own tax burden. This section surveys the growing body of research on *Behavioral Taxation* that deals explicitly with the behavioral effects of tax misperception. An overview of the studies discussed in this section with detailed information on the main features of each study is provided in Table A2 (see online appendices).

4.1.1 Tax Misperception, Investment Decisions, and Risk-Taking

To examine effects of tax misperception on investment and risk-taking, most researchers rely on lab experiments. Unless otherwise stated below, the presented studies do too.

First, studies show that tax misperception and its effects on *investment* depend on *tax salience* and *tax complexity*. Bartolome (1995) is one of the first to study the effect of tax misperception on investment decisions. He finds many individuals using the ATR 'as if' it were the MTR and thus make wrong investment decisions. Rupert and Wright (1998) add that with increasing salience of the MTR subjects make significantly better investment decisions and learn more rapidly. Rupert et al. (2003) find that subjects do not adjust their estimates of the MTR to account for the effects of floors and phase-outs. Thus, tax base complexity increases the probability of erroneous investment decisions. Boylan and Frischmann (2006) demonstrate that tax-related decision errors increase in tax complexity and diminish over time but do not entirely disappear in competitive markets. Boylan (2013) examines the effects of heterogeneous tax information among market participants. He finds that in lab markets in which only a subset of individuals knows the applicable tax rate, the economic benefits generated by the investment of these individuals spill over to their uninformed counterparts.

Second, *tax aversion* (taxes are disliked more than equivalent costs) may result in tax misperception and thus affect *investment* behavior, yet the evidence is mixed.[6] In line with the expected tax aversion, Sussman and Olivola (2011) provide survey evidence that participants prefer tax-exempt bonds over equally profitable bonds that are subject to tax, while Blaufus and Möhlmann (2014) find in lab markets that the word 'taxes' induces a higher equilibrium return on traded debt securities. However, over the course of the experiment the premium disappears, suggesting that tax aversion is not a stable preference but is instead based on a decision heuristic that individuals re-evaluate in repetitive choices. By contrast, using a survey-based conjoint analysis, Hundsdoerfer and Sichtmann (2009) show that German physicians overweigh tax considerations in investment decisions but that this tax misperception is not associated with tax aversion. Fochmann and Kleinstück (2014) also study the effect of tax aversion on investment decisions in an individual choice setting, but do not find any evidence of tax aversion.

Third, prior literature investigates the impact of tax misperception on *risky investments*. Ackermann et al. (2013) as well as Fochmann and Hemmerich (2018) find that the willingness to engage in risky investments decreases when an income tax has to be paid, although net income is identical in all their treatments. Although the reasons for this have not yet been fully clarified, the findings indicate that taxes induce additional *complexity* and thus increase subjects' perception of investment risk. Reducing the decision com-

6 The effect of using tax versus neutral frames is also investigated in tax compliance settings. Some studies find that subjects are more compliant in a tax compared to a neutral context (Baldry, 1986; Trivedi & Chung, 2006; Wartick et al., 1999), other studies find no difference between both frames (Alm et al., 1992).

plexity by reducing the number of future states reduces the perception bias. This corresponds to the results of Abeler and Jäger (2015) who find that background complexity affects tax misperception in a real-effort setting. However, opposite results are observed with respect to tax loss-offsets. Subjects that decide between net-equivalent risky lotteries seem to overestimate the risk reduction effect of tax loss-offsets, so that taxes could also increase risk appetite in cases involving a higher probability of loss (Fochmann et al., 2012b, 2012a; Fochmann et al., 2016).

Further studies on the impact of tax misperception on *risky investments* include Blaufus and Möhlmann (2016) who examine the effect of *tax rate misperception* on risk taking. They compare the effect of a wealth tax and a net equivalent income tax on risk-taking and find greater risk taking in the presence of a wealth tax, which they explain with misperceived 'low' wealth tax rate. Möhlmann (2013) demonstrate that subjects invest in riskier portfolios in case of a *foreign* tax rather than a *domestic* tax on foreign dividend income. This shows that sentiment towards different tax collectors affects decision making. Using *prospect theory* (Kahnemann & Tversky, 1979), researchers have derived and/or tested tax effects on risk taking that deviate from rational choice predictions. Hlouskova and Tsigaris (2012) theoretically analyze the effect of a proportional capital income tax on portfolio decisions and show that tax-induced reactions depend on the reference point. Falsetta et al. (2013) experimentally show that taxpayers invest more (less) in a riskier asset when a tax decrease (increase) is implemented gradually rather than in one go. In a similar vein, Falsetta and Tuttle (2011) examine how expecting a tax refund or an additional tax payment affects investment decisions that themselves do not have any tax consequences. They find in an experiment that subjects entitled to claim a tax refund take significantly less risk than those who have to pay an additional tax. The influence of tax rate changes on the timing of risky investments as well as entry and exit flexibility is studied by Fahr et al. (2014). An exit option seems irrelevant for investment timing in the case of an experienced tax rate decrease, but not in the case of a tax rate increase. Building on the utility-based investment model in Fochmann and Jacob (2015), Mehrmann and Sureth-Sloane (2017) derive prospect theoretical tax effects on risk-taking. They determine tax effects biased by risk and loss aversion for different loss offset restrictions. Fochmann et al. (2016) and Fochmann et al. (2017) experimentally examine the effect of *emotions* on risk-taking. Fochmann et al. (2016) show that the more pleasant and less exciting a tax treatment is perceived to be, the greater the risky investment. Fochmann et al. (2017) provide evidence that investors do not change their risk-taking behavior as a direct consequence of changing tax rules, yet do in response to the affective perception of these different tax rules.

4.1.2 Tax Misperception and Financing Decisions

To the best of our knowledge, the only study on the effect of tax misperception on financing decisions is, Blaufus and Möhlmann (2014). They find in a lab experiment that the cost of debt includes a tax aversion premium, i.e., the cost of debt is higher than the 'rational' value and higher as in a treatment where the term 'transaction cost' is used instead of 'tax'. However, this tax aversion bias disappears in the course of the experiment due to learning effects.

4.1.3 Tax Misperception and Real Effort

Using household survey data, studies estimate a tax perception parameter from regressions that explain reported work effort using pre-tax and after-tax wage income as determinants. The results are heterogeneous. Rosen (1976a), Rosen (1976b) and Brännäs and Karlsson (1996) find that the marginal tax rate is accurately perceived by taxpayers. By contrast, König et al. (1995) find an underestimation while Arrazola et al. (2000) show an overestimation of the MTR.

Another strand of literature is based on lab experiments. Hayashi et al. (2013) find that subjects in net-equivalent treatments are less willing to work both when their wages are partitioned with positive (bonus) and with negative surcharge (tax) components. They explain this result with subjects' complexity aversion. By contrast, Fochmann et al. (2013) demonstrate that subjects work more if their wage is subject to income tax than when they receive a net-equivalent tax-free wage. A similar finding regarding work intensity is shown by Djanali and Sheehan-Connor (2012). The positive effect of taxes on real effort remains significant for high tax rates such as 50%, however the effect size decreases (Fochmann et al., 2013).[7]

The effects of *complexity*-induced tax misperception on work effort are studied in Sielaff and Wolf (2016), who find that the combination of multiple interdependent taxes reduces working time and work performance. Abeler and Jäger (2015) find that subjects in a complex decision environment take their previous real-effort decision as a reference point and do not adjust their decisions as much in response to new taxes as subjects in a simple decision environment. Their results point away from a rational inattention explanation because subjects are as likely to ignore large tax rate changes as they are to ignore small changes in a complex environment. Rather, the results suggest that individuals can only pay attention to a certain amount of information.

Further experiments show that tax *salience* has a significant effect on real effort. Blumkin et al. (2012) demonstrate that the lower salience of a consumption tax leads to greater real effort than an economically equivalent income tax. Fochmann and Weimann

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[7] The reason for this positive effect is not well understood. One explanation is tax misperception because subjects take the gross wage as an anchor and integrate tax burdens incompletely or even not at all (anchor heuristics, Tversky & Kahneman, 1974). An alternative explanation provided by Djanali and Sheehan-Connor (2012) is the pro-social behavior of individuals. Moreover, under the gift-exchange theory (Akerlof, 1982) workers are assumed to respond to high wage levels by increasing their effort due to positive reciprocity. Thus, even if subjects perceive the wage taxes correctly, they could positively reciprocate employers' higher gross wages by increasing their effort.

(2013) graphically illustrate a progressive income tax schedule to show that an increase in tax salience reduces real effort of experimental subjects. Moreover, M. Weber and Schram (2017) provide evidence that real effort is lower when an income tax is levied on the employer side instead of the employee side.

Finally, Kessler and Norton (2016) highlight another channel through which deviations from 'rational' tax perception affect real effort. They provide evidence that subjects are significantly more likely to work less when a decrease in net wage is due to a tax rather than due to a wage cut. The authors explain this with *tax aversion*.

4.1.4 Tax Misperception and Tax Planning

There are relatively few studies that explicitly study the effect of tax misperception on tax planning.[8] Blaufus et al. (2013) provide lab experimental evidence that subjects deciding on different tax options overweight the nominal tax rate and underweight tax base extensions. Other studies show that surprisingly many people do not take advantage of obvious tax planning opportunities (Alstadsæter & Jacob, 2017; Goupille-Lebret & Infante, 2018; Kopczuk, 2007; Stephens Jr & Ward-Batts, 2004). Although it is not fully clear what ultimately triggers forgoing tax planning opportunities, from a behavioral perspective, this might be explained by the lack of visibility of tax planning options for many economic agents. Eberhartinger, Speitmann, Sureth-Sloane, and Wu (2020) study the impact of both interpersonal trust and trust in the government on tax bargaining between tax auditor and taxpayer. They find in a laboratory experiment that a high level of interpersonal trust between taxpayer and tax auditor leads to more concessionary behavior by the tax auditor

[8] Tax misperception may also affect tax evasion since the tax rate is a standard determinant in tax evasion models (Allingham & Sandmo, 1972). Thus, less-salient taxes should reduce non-compliance (Watrin & Ullmann, 2008). Moreover, tax misperceptions also affect perceived tax fairness, another determinant of tax compliance (Kirchler, 2007). While there are tax compliance studies on the effect of misperceived tax audit probabilities, we are not aware of studies that directly address the effect of tax rate misperception on tax evasion (for a recent review of tax compliance research see Alm, 2019).

while taxpayers show more concessionary behavior when her trust in the government is high. These findings contribute to understanding tax planning in anticipation of tax audits and under what conditions an atmosphere of trust might lead to higher compliance.

4.1.5 Tax Misperception, Consumption, and Retirement Savings

The effect of tax misperception on consumption decisions is shown in several (survey) experiments. The effect of *tax aversion* on consumption has been studied by Sussman and Olivola (2011) who show that people are willing to drive or stand in line longer for a tax-related versus a tax-unrelated discount. However, a recent replication study only partly confirms these results (Olsen et al., 2019). With respect to *tax salience*, Chetty et al. (2009), Goldin and Homonoff (2013), Taubinsky and Rees-Jones (2018), and Feldman et al. (2018) find that posting tax-inclusive prices reduces consumption. Whether this effect is clearly due to tax salience and/or a confirmation bias (consumers neglect information that does not align with their consumption intentions) is, however, not fully clear (Feldman et al., 2018; Feldman & Ruffle, 2015). With respect to the *framing* of tax reductions, Epley et al. (2006) provide lab experimental evidence that subjects spend more if a tax reduction is framed as a bonus instead of a tax rebate. Similarly, Lozza et al. (2010) find in a survey experiment that tax reductions framed as an increase in monthly income lead to more spending than if they are framed as a reduction in the monthly tax burden. The behavioral effect of the *timing of taxation* on consumption is mixed. In line with the assumption that individuals use mental accounting (Thaler, 1990), Chambers and Spencer (2008) find in a survey experiment that tax refunds delivered in monthly amounts stimulate current spending more than if the same yearly total tax reduction were delivered in one lump-sum payment. However, using U.S. survey data, Sahm et al. (2012) find a reduction in monthly withholding tax to increase spending less than a one-time payment.

Most countries use special tax regimes to promote *retirement savings* via a deferred taxation of pensions which makes savings tax deductible, interest on savings tax exempt, and pensions fully taxable. However, Chetty et al. (2014) study tax return data and find that 85% of individuals are 'passive savers' who are unresponsive to subsidies. Using administrative firm data, Beshears et al. (2017) find that retirement savings are almost insensitive to the introduction of differently taxed retirement plans. Their supplemental survey results suggest that many employees are unaware of the tax treatment being applied to their savings. Thus, due to tax ignorance, subjects have lower effective savings under deferred than under immediate taxation. The lab experiments of Blaufus and Milde (2020) show that providing informational tax nudges reduces tax misperception and closes the savings gap between immediate and deferred taxed pension plans. Moreover, replacing the tax deductibility of retirement savings with government-matching contributions raises after-tax pensions above the level under immediate taxation without the need to provide informational tax nudges. Cuccia et al. (2017) find that individuals generally prefer immediate over deferred taxation and Stinson et al. (2020) report that subjects anchor on pre-tax values and thus invest in lower-risk and lower-return assets when they have specific retirement goals under deferred taxation. The effect of tax complexity on employees' decisions on company pension plans is studied in Blaufus and Ortlieb (2009). Using a survey-based conjoint analysis, the authors find that with increasing tax complexity, the proportion of subjects who base their decision on their after-tax return decreases significantly.

Summing up, Section 4.1 reveals that even if subjects have access to objective tax information, this information is often misperceived, leading to behavior that systematically deviates from rational choice predictions. This misperception is particularly pronounced when tax complexity is high and tax salience is low. Further, loss and tax aversion seem to explain these behavioral deviations. Moreover, tax framing and timing, too, affect misperception and thus individual decision-making.

4.2 Effects of Corporate Tax Misperception on Decision Making

Studies that particularly address the effect of tax misperception on corporate decision making are rare. Graham et al. (2017) combine survey data with balance sheet and capital market data to study the effect of corporate managers' tax misperception on investment and capital structure decisions. They find that many tax managers, in particular those working in public firms, use the GAAP ETR instead of the correct MTR for decision making. Moreover, the results suggest that as the difference between a firm's MTR and GAAP ETR increases, firms that use the GAAP ETR become less responsive to growth opportunities and adopt a suboptimal debt policy. This study is the first to provide evidence of an association between tax rate misperception and investment as well as financing inefficiency on a corporate level. It complements the experimental findings for individuals discussed in Section 4.1 by demonstrating that even in competitive markets and with professional decision makers, tax misperception may occur and thus inefficient investment and financing decisions are made.

Amberger et al. (2016) use lab experiments to study whether subjects make tax-optimal corporate intra-group financing decisions. In line with Blaufus et al. (2013), they find that subjects under time-pressure overweight tax rate information and underweight tax base information. This holds for both students and highly experienced tax professionals.

Analyzing the usage of tax planning opportunities by corporations, Zwick (2020) reveals that only 37% of corporations that could benefit from loss carryback make use of this possibility. This indicates a substantial misperception of tax planning opportunities.

Moreover, firms differ significantly regarding the speed of tax code learning, with more profitable firms learning faster (Bach, 2015).

5 Management of Tax Perception and its Impact on Stakeholders

Some studies show that corporations strategically avoid disclosing unpleasant tax information to manage stakeholder perception (Akamah et al., 2018; Dyreng et al., 2016). Other studies indicate that firms seem to report some tax information voluntarily to mitigate negative capital market reactions to missing tax information (Balakrishnan et al., 2019; N. Chen et al., 2019; Flagmeier & Müller, 2019). Demeré et al. (2019) provide empirical evidence that firms smooth their GAAP ETRs. Consistently, Flagmeier et al. (2020) find that firms strategically disclose information on their GAAP ETR more visibly if their ETR is favorable from an investor's perspective (low or close to the average ratio for firms of the same industry or size group). Overall, these findings indicate that firms actively manage investors' perception in their tax disclosure strategy.

Further studies examine management of tax perception with respect to the political cost theory. This theory suggests that larger firms are exposed to greater public pressure than smaller firms and thus have higher (reported) ETRs (see e.g., Watts & Zimmerman, 1978; Zimmerman, 1983). Higher (reported) ETRs can be both a result of political costs and a tool to bias the political process. The latter is relevant in terms of firms striving to induce politicians' or voters' misperception on firms' tax burdens. According to Wong (1988), the choice of accounting method is linked to the political costs of a firm. He demonstrates that larger corporations receiving substantial export tax credits are more likely to apply the accounting method that raises their reported ETRs. Northcut and Vines (1998) examine ETR reporting prior to the U.S. Tax Reform Act of 1986. They find that firms with low ETRs boosted their reported tax burdens in the year prior to the reform to reduce the probability of higher taxes. Similarly, Baloria and Klassen (2017) find that corporate tax reform-supporting firms raised their ETRs prior to the 2012 U.S. election to promote candidates who advocated for tax cuts. Moreover, consistent with the political cost argument, Chychyla et al. (2017) find that firms with low (high) ETRs tend to highlight the dollar (percentage) amount of their tax expense. Management of tax perception also plays a role in maintaining public contracts. Mills et al. (2013) provide evidence that politically sensitive contractors exhibit higher federal ETRs. While Wong (1988) and Northcut and Vines (1998) were able to provide clear evidence that higher ETRs result merely from tax perception management, Baloria and Klassen (2017) and Mills et al. (2013) cannot disentangle to what degree higher ETRs result from tax perception management or from higher tax payments.

Table A3 (see online appendices) provides detailed information on all studies discussed in this section.

6 Determinants of Tax Misperceptions: Behavioral Taxpayer Response Model

In this section, we summarize the results of tax perception research by developing a *Behavioral Taxpayer Response Model* that illustrates the impact of the character of provided tax information on tax perception, whether and how the non-tax environment and individual traits moderate this relationship and finally, how the emerging tax perception translates into decisions. The model should help researchers to develop and define their own research questions and derive behavioral predictions. Figure 1 displays the model.

< Insert Figure 1 about here >

The prior sections have shown that *objective* tax information (about tax rates, tax base elements, and tax procedures) is not always perceived correctly by information recipients. Tax misperception exists because many subjects behave in a rationally bounded manner. They consider that purely rational choices are costly to operate in both time and cognitive strain (Simon, 1959). However, there is no single theory that explains bounded rational tax responses. Rather, several approaches coexist in behavioral economics and are employed by tax researchers. These approaches encompass the assumption that individuals use simplifying decision heuristics, are systematically subject to certain perception and decision biases, have no standard-preferences, or are rationally inattentive.

Important heuristics that drive tax misperception are the following. First, using the ironing heuristic, taxpayers linearize the tax schedule for all levels of income using their own ATR. Thus, ironers rely on a proportional tax rate schedule where their ATR determines both the overall ATR and MTR. The ironing hypothesis is supported by Bartolome (1995), Liebman and Zeckhauser (2004), Feldman and Katuščák (2006), and Rees-Jones and Taubinsky (2019). Second, using the spotlighting heuristic, individuals assume the slope of the tax schedule is equal to their own MTR over the entire income range. Liebman and Zeckhauser (2004) and Feldman and Katuščák (2006) provide evidence in support of the spotlighting heuristic. Third, the use of the anchor heuristic can explain biased tax effects on real effort as decision making may depend primarily on pre-tax wages (e.g., Fochmann et al., 2013). Fourth, the use of a lexicographic heuristic can explain the observation that tax rate information is overweighted in comparison to tax base information (Blaufus et al., 2013). Fifth, subjects use rounding heuristics in estimating the tax burden (Taubinsky & Rees-Jones, 2018). Sixth, subjects use mental accounts to simplify their decision making. Thus, tax refunds administered as one lump-sum affect behavior differently from tax refunds in the same amount that are refunded monthly through reduced income tax withholding (Chambers & Spencer, 2008).

Besides the use of heuristics, research from economic psychology highlights the existence of behavioral biases that affect tax misperception. For example, subjects disregard information on sales tax because the additional tax burden contradicts their consumption intention (confirmation bias, Feldman & Ruffle, 2015), or information on income tax rates is overweighted compared to tax base information because tax rate information is generally more easily available (availability bias, Blaufus et al., 2013). Some subjects have a larger disutility from paying taxes than they do if paying the same amount in other costs (tax aversion bias, Blaufus & Möhlmann, 2014; Kessler & Norton, 2016; Sussman & Olivola, 2011). By contrast, other subjects have non-standard utility functions and perceive an additional positive utility from paying taxes to contribute to public goods (tax affinity, Djanali & Sheehan-Connor, 2012). Non-standard utility functions may also include fairness considerations. If utility functions include fairness preferences, not only the perception of one's own tax burden but also that of others is relevant for decision making. Non-standard utility functions further encompass reference-point dependency, for example, the different valuation of gains and losses according to prospect theory (Kahnemann & Tversky, 1979). Therefore, framing tax reductions as a bonus or rebate affects decision making (Epley et al., 2006).

Finally, there is some evidence that inattention to taxes decreases with the amount of the tax. This points towards a rational inattention explanation of tax misperception (Amberger et al., 2016; Taubinsky & Rees-Jones, 2018) because information is more likely to be incorporated in decision-making if ignoring it is more costly (Abeler & Jäger, 2015). However, the evidence regarding this issue is inconclusive (Abeler & Jäger, 2015; Feldman et al., 2018).

Because the use of heuristics and the existence of behavioral biases depend on individual traits, the properties of tax information, and the characteristics of the general decision environment, we distinguish (i) tax information determinants, (ii) individual determinants, and (iii) determinants of the decision environment. In Table 2, we present detailed information about these determinants, the operationalizations used in prior research, and the direction of the determinants' effect on tax misperception.

< Insert Table 2 about here >

First, regarding *tax information determinants* (Panel A of Table 2), previous research has found that misperception of objective tax facts increases with decreasing salience (Blumkin et al., 2012; Cabral & Hoxby, 2012; Chetty et al., 2009; Finkelstein, 2009; Goldin, 2012; Sausgruber & Tyran, 2005; Taubinsky & Rees-Jones, 2018; M. Weber & Schram, 2017). The salience of taxes may depend on who is obliged to pay the tax, on whom the tax is levied (direct taxes, indirect taxes, withholding taxes), the payment mechanism (individual transfer, electronic collection), and whether taxes are displayed (prices with/without sales tax).

In addition, tax complexity has been shown to increase tax misperception. It reduces real effort (Sielaff & Wolf, 2016) and increases the probability of erroneous investment decisions (Boylan & Frischmann, 2006; Rupert et al., 2003; Rupert & Wright, 1998). In complex tax systems, many subjects base their decisions on pre-tax variables (Blaufus & Ortlieb, 2009). Tax complexity also affects corporate tax misperception. Graham et al. (2017) report that firms with a large proportion of assets in foreign locations (making it very complex to calculate the correct MTR) are less likely to use the MTR for decision making. Furthermore, Bratten et al. (2017) find that the accuracy of managers' and analysts' ETR forecasts decreases when tax rate complexity is high.

Tax framing is another tax information determinant that affects decision making. Empirical results suggest that the label 'tax' itself may be negatively perceived by tax averse individuals and that changing the label of a tax affects its perceived burden (e.g., Hundsdoerfer et al., 2013; Kessler & Norton, 2016; Löfgren & Nordblom, 2009). Also, the framing of a tax reduction as a bonus instead of a rebate seems to influence spending behavior (e.g., Epley et al., 2006). Furthermore, the format of tax information affects perception. Normative assessments of tax progressivity differ when expressed in tax rates or in dollar amounts. Tax burdens assigned in dollars rather than in tax rates are significantly lower (Hite & Roberts, 1991; McCaffery & Baron, 2003); subjects presented with ETR information in percentage format make more accurate tax expense forecasts than subjects who are presented with a dollar format (Chychyla et al., 2017).

In addition, tax timing influences tax perception (Chambers & Spencer, 2008; Falsetta et al., 2013) when subjects use mental accounts (Thaler, 1990) or have prospect theoretical utility functions (Kahnemann & Tversky, 1979). Finally, tax uncertainty may increase tax misperceptions (e.g., Bratten et al., 2017).

Second, to what extent objective tax information is perceived accurately depends on a number of *individual determinants* that moderate the effect of tax information on the subjective tax burden and thus on tax-related decision making (Panel B of Table 2). Because the use of heuristics and the existence of behavioral biases are usually negatively associated with knowledge and cognitive capacity, it is not surprising that most studies find that tax misperception decreases with better tax knowledge and higher cognitive capacity. This negative effect on tax misperception has been found for individual taxpayers (Blaufus et al., 2015; Gensemer et al., 1965; Gideon, 2014; Slemrod, 2006; Williamson, 1976), in a corporate context (Alstadsæter & Jacob, 2017; Amberger et al., 2016; Bach, 2015; Graham et al., 2017) and for financial analysts (D. P. Weber, 2009).

In addition to tax knowledge and cognitive capacity, a variety of other individual moderators determine the perception of tax information. If tax information is in conflict with their own behavioral intentions, individuals may ignore or underweight this information due to a confirmation bias (Feldman et al., 2018; Feldman & Ruffle, 2015). Emotions, too, can affect tax perception, particularly in risky investment decisions (Fochmann et al., 2016; Fochmann et al., 2017).

Other individual traits that have been examined as potential determinants of tax misperception include age, gender, ideology, and attitudes towards taxation, income, home-ownership, marital status, and self-employment. Most studies find that tax misperception decreases in income due to higher rewards from tax planning, which makes it more attractive to learn more about tax laws. Concerning the other mentioned variables, the evidence is, however, inconclusive (see Table 2, Panel B for detailed references).

Third, besides characteristics of the tax information and traits of the decision maker, the general *decision environment* also shapes the extent of tax misperception (see Panel C of Table 2). If the decision environment is already very complex, the probability of additional tax information being misperceived increases (Abeler & Jäger, 2015). Moreover, learning opportunities and competition are important debiasing tools. Firms operating in environments with greater product market competition are more likely to use the correct MTR for decision-making (Graham et al., 2017). Boylan and Frischmann (2006) and Blaufus and Möhlmann (2014) show that tax-related decision errors persist, but diminish over time in competitive market settings. In repetitive decisions, subjects often have the opportunity to learn and reduce tax misperception, which is not possible with one-off or irregularly occurring decisions (Blaufus et al., 2013; Blaufus & Milde, 2020; Blaufus & Möhlmann, 2014; Rupert & Wright, 1998). Social networks, peers, media attention, and the relationship with the tax authorities also shape the environment that constitute individual beliefs (and managers' beliefs, McGuire et al., 2012) and ultimately coin (corporate) taxpayers' attitude towards taxes and tax planning (Hasan et al., 2017).

According to rational inattention models, increasing incentives should reduce tax misperception. Supporting evidence stems from Goldin and Homonoff (2013), Amberger et al. (2016), Graham et al. (2017), and Taubinsky and Rees-Jones (2018). Graham et al. (2017) find that firms are less likely to use the statutory tax rate (STR) instead of the correct MTR for decision-making when the difference between the MTR and STR increases. Goldin and Homonoff (2013) show that only low-income consumers respond to changes in less salient cigarette taxes. Amberger et al. (2016) observe that the share of tax-minimizing decisions increases in the tax burden difference between two options, and Taubinsky and Rees-Jones (2018) show that increasing sales tax rates reduce tax misperception. By contrast, Abeler and Jäger (2015) and Feldman et al. (2018) do not find that tax misperception decreases with increasing tax rates.

There is some evidence that time pressure increases tax misperception (Amberger et al., 2016) and that the prepayment position matters for tax perception. Taxpayers who owe taxes seem to make greater errors in estimating their MTR than those who are entitled to a refund (Rupert & Fischer, 1995). Lastly, an uncertain decision environment affects tax misperception, too (e.g., Fochmann et al., 2012b, 2012a).

In a corporate context, two further moderators are relevant to tax misperception. First, there seems to be a difference between private and public firms due to differences in the salience of tax information. In line with the assumption that the GAAP ETR (STR) is particularly salient for managers of public (private) firms, Graham et al. (2017) show that public (private) firms are more likely to use the GAAP ETR (STR) instead of the correct MTR for decision making. Thus, a capital market focus may favor tax misperception due to the concentration on accounting-related tax information (GAAP ETR) instead of the decision-relevant MTR. Second, the level of corporate governance and the quality of the firm's information environment reduce tax misperception. Firms with strong institutional ownership are more likely to use the MTR for decision making (Graham et al., 2017). Tax related forecasts errors decrease with increasing institutional ownership (Kim et al., 2020) and increasing numbers of analysts following a firm (Kim et al., 2020; D. P. Weber, 2009).

If taxpayers' *subjective* tax burden deviates from the *objective* burden and they make their decisions without the help of information intermediaries, tax responses deviate from rational choice predictions. However, if subjects follow unbiased advice from their employer, investment advisory firms, the media, the tax agency, or professional tax advisors, their own tax misperception does not translate into decision errors.[9] Thus, we consider the use of information intermediaries as a moderator of the relationship between tax information and behavioral tax responses in the *Behavioral Taxpayer Response Model*. In line with this, Zwick (2020) shows that sophisticated tax preparers reduce non-optimizing tax decisions of corporations.

In sum, the presented model shows that tax misperception is a function of specific individual traits, tax information characteristics, and properties of the decision environment. Moreover, whether tax misperception translates into tax-related decision errors depends on the availability and use of unbiased tax advice.

7 Open Research Questions

Each section of our review has revealed several open research issues. Regarding individual

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[9] Unbiased advice could also serve as a source of information and thereby decrease taxpayers' tax misperception. However, prior evidence reveals that using tax preparation assistance is positively correlated with tax misperception (Ballard & Gupta, 2018; Gideon, 2014; Rupert & Fischer, 1995). This suggests that taxpayers who seek tax advice delegate their tax affairs to experts without building up their own expertise. In line with this, research shows that taxpayers seek tax advice even if the resulting tax savings are lower than the fees paid to preparers to reduce tax uncertainty and cope with the inherent tax complexity (Blaufus, Hechtner, & Möhlmann, 2017).

and corporate tax misperception (Section 3), we observe that researchers use different approaches to measure tax misperception but there is no research that compares these approaches with respect to the extent of measured tax misperception. Moreover, we are not aware of studies that conduct cross-country comparisons, compare misperceptions across different kind of taxes, or directly measure corporate managers' misperception of tax rates or tax burdens.

With respect to the effects of tax misperception on decision making (Section 4), we identify open research issues concerning non-business, business, and corporate decision making. While much behavioral tax research focuses on non-business decisions, surprisingly we find almost no research on the effect of tax misperception on typical household finance decisions such as housing, the realization of capital gains, or private portfolio decisions. Regarding business decisions, the reviewed research has mainly studied the effect of tax misperception on investment and risk-taking decisions. By contrast, there is a dearth of research on the effect of tax misperception on other business decisions such as the choice of organizational form, employment, financing, location choice, production, supply chain, and tax planning. Regarding decision-making of corporate managers, our knowledge is particularly limited. In addition to the already mentioned business decisions which should also be examined on a corporate level, future research should also address how corporate tax misperception affects accounting choices, the type and implementation of tax risk management systems, usage of tax uncertainty shields, and participation in voluntary co-operative tax compliance programs.

In terms of both the occurrence and magnitude of tax misperception and its impact on decision making, there is a research gap regarding the misperception of the tax burden of others. Behavioral tax compliance research suggests that there are spill-over effects on one's own economic decisions (e.g., Blaufus, Bob et al., 2017; Lefebvre et al., 2015).

Meanwhile, studies in accounting have revealed many roles of peers in explaining firm behavior (see Bird et al., 2018 for tax planning activities). However, studies on the effect of corporate misperception of peers' tax burden are missing. One could expect these spill-over effects to concern other decisions, too, such as both individual and corporate manager decisions and especially real effort, compliance, and investment decisions, yet also decisions on tax planning or location choices.

Another research gap concerns the management of tax misperception by corporations and its impact on stakeholders (Section 5). For example, we know little about how firms manage tax accounting information and its disclosure to influence stakeholders' perception of the firms' tax burden. Regarding the determinants of tax misperception (Section 6), we identify several research questions that encompass the optimal design of tax information to reduce tax misperception or to foster investment or savings decisions, the determination of firm characteristics that influence tax misperception, the effect of incentive schemes on tax misperception, and the effect of information intermediaries on tax misperception and tax-related decision errors. We provide a detailed overview of open research issues and provide a comprehensive but at the same time non-exhaustive list of open research questions. We structure these research questions along the topics of this literature review (occurrence and magnitude of individual and corporate tax misperception, effects of tax misperception on decision making, management of tax misperception and its impact on stakeholders, determinants of tax misperception) in Table 3.

<Insert Table 3>

8 Conclusion

The surveyed research demonstrates that many taxpayers suffer from substantial tax misperception. They have no accurate knowledge of either their average or their marginal tax rate. The estimates for the percentage of taxpayers who largely accurately perceive their income tax rate range from under 10% to 44%. Moreover, most studies report that subjects overestimate their ATR although the direction of misperception seems to depend on the income level. Regarding the MTR, over- and underestimations are observed, with some taxpayers (including corporate managers) mistaking ATRs for MTRs, which leads to an underestimation of the progressive tax schedule. In addition, even if accurate tax information is provided, taxpayers often do not incorporate taxes into their decision making in a way predicted by rational choice theory. Thus, tax misperception results from two sources: (i) lack of tax knowledge and (ii) misapplication of tax information in decision making. The reason for this tax misperception is that many subjects behave in a rationally bounded manner, i.e., they consider that purely rational choices require much time and cognitive effort to operate. To account properly for tax misperception in research, we develop the *Behavioral Taxpayer Response Model* which can be employed for both theoretical and empirical research to customize misperception (determinants and effects) for the underlying research question. Based on the assumption of taxpayers' bounded rationality, this model systematizes prior research on the determinants of tax misperception with respect to (i) tax information determinants, (ii) individual determinants, and (iii) determinants of the decision environment.

We identify numerous opportunities for future research (see Table 3). The most obvious research gap concerns limited knowledge regarding tax misperception of corporate managers and its effect on corporate decision making. While the results of individual choice experiments may be descriptive for small businesses, such as sole proprietorships or small corporations, one should be cautious when translating these results directly to the context of large corporations with professional tax management. Future research should therefore follow and extend the studies of Graham et al. (2017) and Zwick (2020).

This research gap is surprising, as it is important to understand the sender-receiver paradigm of tax relevant information both as disclosed by taxpayers and as provided by regulators and monitoring bodies.

It is noticeable that previous research offers a variety of different theoretical explanations for tax misperception. However, often the concrete behavioral channel is not clearly identified. Instead, most economic studies simply assume a misperception parameter but still use a standard neoclassical decision model to explain behavior. Sometimes this raises problems in determining whether the observed effect is due to tax misperception or due to the wrong specification of the decision model. This holds true especially for the effects of tax misperception on real effort, but could also explain the inconclusive results concerning the effects on risk taking. Future research therefore needs to further improve the identification strategy. Moreover, despite emphasizing the importance of perception heterogeneity, many experiments still determine only average treatment effects which often mask heterogeneous tax responses.

Regarding the applied empirical methodology, we observe a dominance of experimental and survey studies. Due to the high internal validity of experiments, these studies allow causal inferences. However, experiments are limited to very simplified tax rules and relatively low economic incentives. In particular, accounting researchers could build on previous economic tax experiments by adding more institutional details. By contrast, surveys allow for collecting data on representative samples but offer lower internal validity and suffer from a lack of economic incentives. To overcome limitations concerning internal or external validity, a mixed-method approach combining surveys, experiments, and archival data analyses seems very promising. Thus, we encourage future research to pursue this avenue to help substantiate ongoing international tax policy debates and better understand the impact of tax misperception on entrepreneurial and corporate decision making.

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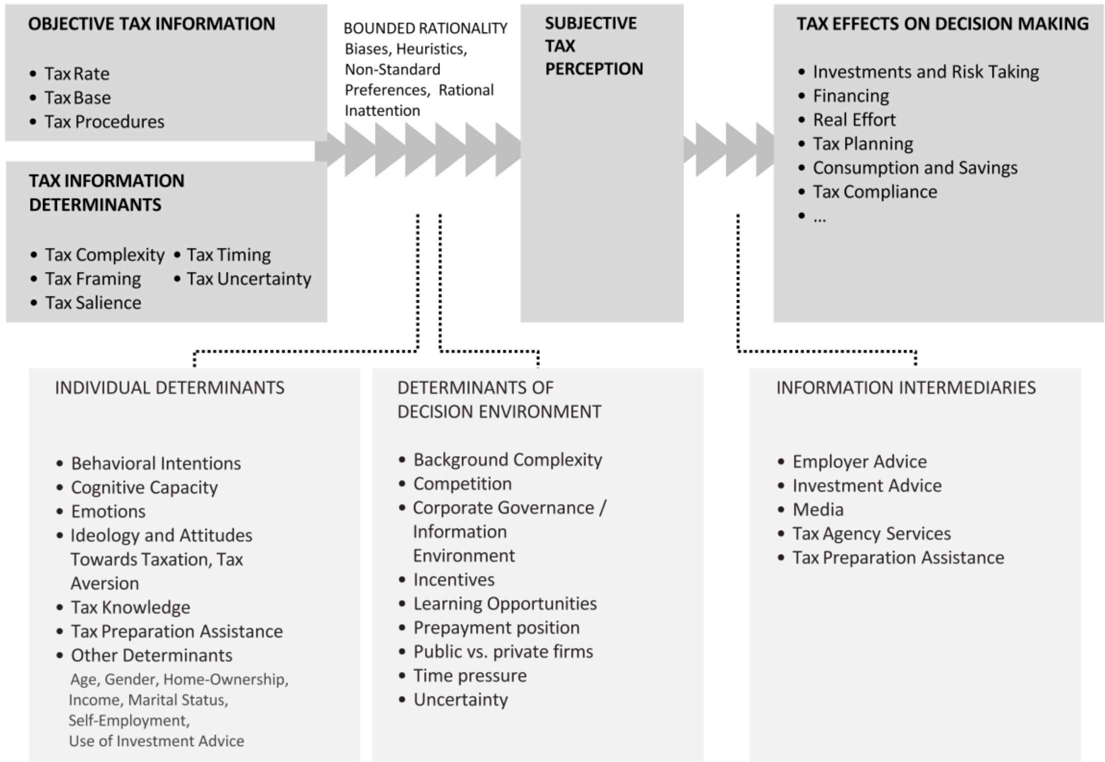
Figure 1: *Behavioral Taxpayer Response Model*



Notes: This figure illustrates tax misperception in a behavioral tax response model. The model describes the impact of the type and character of provided tax information (TAX INFORMATION DETERMINANTS) on tax perception ((SUBJECTIVE) TAX PERCEPTION). Also, it captures whether and how the non-tax environment (DETERMINANTS OF THE DECISION ENVIRONMENT) and individual traits (INDIVIDUAL DETERMINANTS) moderate this relationship. Finally, the model describes how the resulting tax perception translates into decisions (TAX EFFECTS ON DECISION MAKING) and how this translation is moderated by the use of information intermediaries (INFORMATION INTERMEDIARIES).

Table 1: *Studies Grouped by Methodology over Time*

	before 1990	1990-1999	2000-2009	2010 or later	Total
Tax Misperception					
Survey	12	3	6	10	31
Archival Data Analysis	2	1	5	10	18
Non-Incentivized Survey Experiment	0	0	0	3	3
Incentivized Survey Experiment	0	0	0	2	2
Field Experiment	0	0	1	0	1
Lab Experiment	0	1	0	1	2
Theoretical Analysis	0	0	0	1	1
Total	14	5	12	27	58
Effects of Tax Misperception on Decision Making					
Survey	2	2	3	3	10
Archival Data Analysis	0	0	2	8	10
Non-Incentivized Survey Experiment	0	0	3	5	8
Incentivized Survey Experiment	0	0	0	2	2
Field Experiment	0	0	2	3	5
Lab Experiment	0	2	4	28	34
Theoretical Analysis	0	0	0	3	3
Total	2	4	14	52	72
Management of Tax Perception and its Impact on Stakeholders					
Survey	0	0	0	0	0
Archival Data Analysis	3	1	0	10	14
Non-Incentivized Survey Experiment	0	0	0	0	0
Incentivized Survey Experiment	0	0	0	0	0
Field Experiment	0	0	0	0	0
Lab Experiment	0	0	0	1	1
Theoretical Analysis	1	0	0	0	1
Total	4	1	0	11	16

Notes: This table gives an overview of all 127 surveyed studies. Since some studies use more than one methodology, the number of total studies does not add up to 127.

Table 2: *Determinants of Tax Misperceptions*

Panel A: Tax Information Determinants

Tax complexity	
AICPA's tax complexity index	Plumlee (2003) finds that the magnitude of errors in ETR forecasts increases with the complexity of tax law changes.
Combination of multiple interdependent taxes	Increases tax misperception, reduces working time and performance (Sielaff & Wolf, 2016).
Proportion of assets in foreign locations	Firms with a large proportion of their assets in foreign locations are less likely to use the MTR for decision-making (Graham et al., 2017).
Tax Complexity Index (TCI)	Hoppe et al. (2020) find that tax framework complexity is negatively associated with countries' governance, suggesting that strongly governed countries show lower levels of tax misperception. By contrast, tax code complexity is found to be positively associated with the statutory tax rate, indicating that high-tax countries' tax code could fuel tax misperception.
Tax rate complexity factor	Bratten et al. (2017) find that the accuracy of managers' and analysts' ETR forecasts decreases when tax rate complexity (capturing absolute changes in ETR, the absolute difference between STR and ETR, and ETR volatility) is high.
Tax rate information, floors and phase-outs	Increasing tax complexity increases the probability of erroneous investment decisions (Boylan & Frischmann, 2006; Rupert et al., 2003; Rupert & Wright, 1998).
Time needed for understanding the tax rules	With increasing tax complexity, the proportion of subjects that make tax-optimal decision decreases significantly (Blaufus & Ortlieb, 2009).
Tax framing	
Prospect Theory	The framing of a tax reduction as a bonus instead of a tax rebate or as increase in monthly income instead of a reduction of the monthly tax burden affects spending behavior (e.g., Epley et al., 2006). Fahr et al. (2014) find that the presence of an exit option seems to be irrelevant for (affects) investment timing in the case of an experienced tax rate decrease (increase). Mehrmann and Sureth-Sloane (2017) analytically show that tax loss offset restrictions significantly bias investor perception even more heavily than the tax rate.
Tax labels	Different labels for taxes can affect the perceived tax burden (Hundsdoerfer et al., 2013; Löfgren & Nordblom, 2009). The label 'tax' itself can affect the perceived burden of tax averse subjects (Blaufus & Möhlmann, 2014; Kessler & Norton, 2016; Sussman & Olivola, 2011).
Format of tax information	Tax burdens assessed in dollars rather than rates are significantly less progressive (Hite & Roberts, 1991; McCaffery & Baron, 2003) and subjects presented with ETR information in a percentage format make more accurate tax expense forecasts than do subjects presented with the information in a dollar format (Chychyla et al., 2017).
Tax salience	
Direct vs. indirect taxes	Higher tax misperception for indirect taxes (Blumkin et al., 2012; Sausgruber & Tyran, 2005).
Graphical illustration of progressive tax schedule	Reduces tax misperception (Fochmann & Weimann, 2013).
Payment method	Less salient payment methods increase property tax misperception (Cabral & Hoxby, 2012) and toll payment misperception (Finkelstein, 2009). Income tax perception depends on whether the tax is levied on the employer side or the employee side (M. Weber & Schram, 2017). The point of tax collection also affects the economic incidence of tax (Morone et al., 2018).
Tax inclusive vs. exclusive prices	Tax inclusive prices reduce demand (Chetty et al., 2009; Goldin, 2012; Taubinsky & Rees-Jones, 2018).
Tax timing	Tax refunds administered in one lump sum are less likely to be spent than monthly tax refunds of the same amount through reduced income tax withholding (Chambers & Spencer, 2008). However, this finding is not confirmed by Sahm et al. (2012). Falsetta et al. (2013) show that taxpayers invest more (less) in a riskier asset when there is a tax decrease (increase) that is implemented gradually rather than all at once.
Tax uncertainty	Increases tax misperception (e.g., Bratten et al., 2017).

Panel B: Individual determinants

Behavioral intentions	Due to a confirmation bias, consumers neglect tax information that does not align with their consumption intentions (Feldman et al., 2018; Feldman & Ruffle, 2015).
Cognitive capacity	
Education	A positive association between education and accuracy of tax perception is demonstrated by Gensemer et al. (1965), Williamson (1976), Slemrod (2006), Blaufus et al. (2015), and Amberger et al. (2016), while other studies find no statistically significant effect of education (Ballard & Gupta, 2018; Fujii & Hawley, 1988; Gideon, 2014).
Management ability	The speed at which tax planning opportunities are identified correlates with the ability of corporate management to generate higher returns (Bach, 2015).
Numerical intelligence	Decreases ATR misperception, but has no effect on MTR misperception (Gideon, 2014).
Social class	Lewis (1978) finds social class and the accuracy of MTR estimates being positively associated.
Emotions	Fochmann et al. (2016) show that the more pleasant and less exciting a tax treatment is perceived, the higher the amount that is riskily invested. Fochmann et al. (2017) provide evidence that investors do not change their risk taking behavior as a direct consequence of changing tax rules but due to the affective perception of these different tax rules.
Ideology and attitudes towards taxation, tax aversion	Lewis (1978) and Slemrod (2006) report no association between political party affiliation and tax misperception. Ballard and Gupta (2018) find the same for ideology while Williamson (1976) finds weak explanatory power for ideology. Ballard and Gupta (2018) report more pronounced tax rate overestimates by respondents who either regard people like themselves being taxed too high or who assume that taxes are spent ineffectively. Sussman and Olivola (2011), Blaufus and Möhlmann (2014), Kessler and Norton (2016) show that some individuals dislike tax payments more than equivalent costs. Fochmann and Kleinstück (2014) do not find tax averse behavior.

Tax knowledge	
Accounting education	Graham et al. (2017) finds a negative effect for accounting-related education of corporate tax managers on tax rate misperception.
Factual tax questions	Slemrod (2006) finds no association between tax knowledge and misperception of tax schedule progressivity.
Firm size, high-R&D-intensity firms	Graham et al. (2017) assume that larger firms and high R&D-intensity firms are likely to have greater tax compliance activities and/or greater tax planning opportunities, which leads them to employ well-trained tax personnel. They find that the likelihood of using the MTR for decision-making (instead of the ETR) increases with firm size and high R&D-intensity.
Investment activity	Decreases misperception of MTRs (Gensemer et al., 1965)
Occupation in banking, insurance, stock brokerage, and accountancy	Decreases misperception of MTRs (Gensemer et al., 1965)
Self-rated familiarity with the federal income tax rate structure	In contrast to other studies, Rupert and Fischer (1995) find increasing tax misperception of the MTR when subjects state that they have extensive tax knowledge.
College degree in economics/law, having parents who run a business	Alstadsæter and Jacob (2017) show that having a college degree in economics or law and having parents who run a business is positively associated with the use of tax planning options.
Years of experience as analysts	Decreases misperception of tax-related information (D. P. Weber, 2009).
Tax preparation assistance	Using tax preparation assistance is positively correlated with tax rate misperception (Ballard & Gupta, 2018; Gideon, 2014; Rupert & Fischer, 1995).
Other variables	
Age	According to Gideon (2014), Ballard and Gupta (2018) and Feldman et al. (2016), age is negatively associated with tax misperception, while Lewis (1978) finds more accurate estimates only for middle-aged individuals. By contrast, Blaufus et al. (2015) report more pronounced misperception among elderly people of their MTR and Slemrod (2006) of tax rate schedule progressivity.
Gender	Gender does not play a role in tax misperception, according to Gideon (2014), Ballard and Gupta (2018), and Fujii and Hawley (1988). Blaufus et al. (2015) find a gender effect only for overestimates, which are more pronounced for men. Slemrod (2006) reports that men underestimate tax schedule progressivity far more than women.
Home ownership	While Fujii and Hawley (1988) find a negative association with tax misperception, Ballard and Gupta (2018) find no significant association.
Income	A positive association between income and accuracy of estimates is confirmed by Rupert and Fischer (1995), Ballard and Gupta (2018), Williamson (1976) and Feldman et al. (2016), whereas Blaufus et al. (2015) show income and underestimates of own MTRs to be associated.
Marital status	Slemrod (2006) and Gideon (2014) find no correlation, whereas Ballard and Gupta (2018) indicate more overestimates among married respondents.
Self-employment	Feldman et al. (2016) show that self-employment reduces tax misperception, while Schmölders (1960) reports the opposite. Blaufus et al. (2015) find no significant association.
Use of investment advice	Negative correlation with tax misperception (Rupert & Fischer, 1995)

Panel C: Determinants of the Decision Environment

Background complexity	The initial tax complexity of a decision environment increases misperception of subsequently introduced new, simple taxes (Abeler & Jäger, 2015).
Competition	Firms operating in environments with greater product market competition are more likely to use the MT (instead of the ETR) for decision making (Graham et al., 2017). Boylan and Frischmann (2006) and Blaufus and Möhlmann (2014) show that tax-related decision errors persist in competitive market settings but diminish over time.
Corporate governance / information environment	
Implementation of XBRL	Reduces analysts' misperception of tax-based earnings information (Kim et al., 2020).
Institutional ownership	Firms with high institutional ownership are more likely to use the MTR (instead of the ETR) for decision-making (Graham et al., 2017). Tax related forecasts errors decrease with increasing institutional ownership (Kim et al., 2020).
No. of analysts following the firm	Reduces tax related forecasts errors (Kim et al., 2020; D. P. Weber, 2009).
Incentives	Increasing incentives reduce tax misperception. Firms are less likely to use the STR for decision making when the difference between the MTR and STR is larger (Graham et al., 2017). Goldin and Homonoff (2013) find that only low-income consumers respond to changes in cigarette taxes, Amberger et al. (2016) observe that the share of tax-minimizing decisions increases the larger the tax burden difference between two options. Taubinsky and Rees-Jones (2018) show that increasing sales tax rates reduce misperception. By contrast, Abeler and Jäger (2015) and Feldman et al. (2018) do not find that tax misperception decreases with increasing tax rates.
Learning opportunities	Feedback from other market participants and learning by doing reduce tax-related decision errors/biases (Blaufus et al., 2013; Blaufus & Milde, 2020; Blaufus & Möhlmann, 2014; Boylan & Frischmann, 2006; Rupert & Wright, 1998).
Prepayment position	Taxpayers who owe taxes make greater errors in estimating their MTR than those who are entitled to a refund (Rupert & Fischer, 1995).
Public vs. private firms	According to Graham et al. (2017), public (private) firms are more likely to use the ETR (STR) instead of the MTR for decision-making, A stronger capital market focus (measured by the number of analysts following the firm) increases the likelihood of the ETR (instead of the correct MTR) being used for decision making (Graham et al., 2017).
Time pressure	Time pressure increases tax misperception (Amberger et al., 2016).
Uncertainty	Uncertainty related to the decision environment affects tax misperception, for example via loss-offset misperception (e.g., Fochmann et al., 2012b, 2012a).

Notes: This table gives an overview of findings on individual and tax information determinants and determinants of the decision environment.

Table 3: *Open Research Issues*

1. Individual and corporate tax misperception (occurrence and magnitude)

GENERAL

- How does the measurement method affect the magnitude of tax misperception?
- Does tax misperception differ across countries?
- How does tax misperception differ (direction and magnitude) across different kinds of taxes?
- Does the misperception of the absolute and relative tax burden (tax burden distribution) vary?

CORP.

- To what extent do corporate managers misperceive tax rates?
- Do corporate managers misperceive different tax rates (ETR vs. MTR) differently?
- Do corporate managers misperceive the tax burden of their peers?

2. Effects of tax misperception on decision making

NON-BUSINESS

- How does tax misperception affect housing decisions?
- How does tax misperception affect the realization of capital gains?
- How does tax misperception affect portfolio selection?
- What explains the different results regarding tax misperceptions on risk-taking?
- What behavioral channel explains the positive effect of taxes on real effort despite net equivalent payoffs?
- How does misperception of peers' tax burden affect non-business decisions?

BUSINESS

- How does tax misperception affect the choice of organizational form?
- How does tax misperception affect employment decisions?
- How does tax misperception affect financing decisions?
- How does tax misperception affect investment decisions?
- How does tax misperception affect location decisions (within a country and cross-border)?
- How does tax misperception affect production and supply chain decisions?
- How does tax misperception affect tax planning decisions?
- How does misperception of peers' tax burden affect business decisions?

CORPORATE

- How does tax misperception affect employment decisions?
- How does tax misperception affect investment decisions?
- How does tax misperception affect financing decisions?
- How does tax misperception affect location decisions (within a country and cross-border)?
- How does tax misperception affect payout decisions?
- How does tax misperception affect production and supply chain decisions?
- How does tax misperception affect tax planning decisions?
- How does tax misperception affect the type and implementation of tax risk management systems?
- How does tax misperception affect usage of tax uncertainty shields (ATR, APA)?
- How does tax misperception affect participation in voluntary co-operative compliance programs?
- How does tax misperception of non-profit taxes affect decisions at corporate level (property tax, inheritance tax, excise tax)?
- How does tax misperception affect tax accounting choices?
- How does misperception of peers' tax burden affect corporate decisions?

3. Management of tax perception and its impact on stakeholders

- Can firms exploit consumers' tax misperception by implementing 'tax-free' advertising campaigns?
- Which forms of information provision do firms use to manage their tax disclosures (texts, graphs, tables, numbers, notes)?
- Which channels of information provisions do firms use to manage their tax disclosures (annual reports, investor conferences and road shows, media, social media)?
- How do firms manage their tax disclosures to influence their stakeholders (customers, workforce, investors, tax authorities, regulatory bodies, politicians)?
- Which accounting systems do firms use to generate the numbers required by (mandatory) tax reporting (local GAAP, IFRS, managerial accounting numbers)?
- Do firms manage tax misperception via tax expenses (e.g., accruals management) or deferred taxes?

4. Determinants of tax misperceptions (Behavioral Taxpayer Response Model)

TAX INFORMATION

- How should tax information be designed and distributed to reduce misperception?
- How should tax disclosures in financial accounting be designed to improve the accuracy of tax perceptions?
- Do information interventions such as the display of the individual ATR and MTR in tax assessment notes (as is common in some countries) improve the accuracy of tax perception?
- To what extent do increased tax transparency rules (country-by-country reporting, FIN 48/IFRIC 23, DAC6) affect the tax misperception of corporate stakeholders (investors, financial analysts, revenue agents, consumers)?
- What is the relationship between tax uncertainty and tax misperception?
- What is the relationship between tax code/framework complexity and tax misperception?
- How should tax incentives to increase retirement savings be designed from a behavioral taxation perspective?
- How should tax incentives to foster investment be designed from a behavioral taxation perspective?

INDIVIDUAL

- How does individuals' or corporate managers' attitude towards the government affect tax misperceptions (trust, political attitudes, prior experiences with government bodies)?
- To what extent do tax misperception depend on firm/corporate characteristics?

ENVIRONMENT	• To what extent does corporate managers' tax misperception depend on incentive schemes? • To what extent does corporate managers' tax misperception depend on their relative position and power in the organization? • To what extent does corporate managers' tax misperception depend on being active in industry specific networks (lobbyism)? • How does the implementation and kind of tax risk management system affect tax misperception? • Is tax misperception during crises any different?
INTERMEDIARIES	• Do tax advisors provide biased tax information and what drives the direction and magnitude of biases? • Does the use of tax software affect tax misperceptions? • Do the media provide biased tax information and what drives the direction and magnitude of biases? • Do employers provide accurate tax information? • Do investment advisors provide accurate tax information?

Appendix Table A1: Tax Misperception

Reference	Tax Type	Country	Subject Pool	Sample Size	Sample Year	Research Design	Research question	Results
Amir and Sougiannis (1999)	Corporate Income Tax	United States	Analysts and investors	1,085 firm-year observations	1992-1994	Archival Data Analysis	How do financial analysts and equity investors incorporate information on deferred taxes from carryforwards into earnings forecasts and share prices?	Analysts consider earnings of firms with tax loss carryforwards less persistently and tend to be less precise and more biased in forecasting these firms' earnings. Investors value deferred taxes from carryforwards as assets but rate earnings and book values of equity less in firms with carryforwards.
Auld (1979)	Personal Income Tax	Canada	Individuals	630	1975	Survey	How much do people know about public expenditure and their income tax burden?	Respondents within the two lowest income groups and with the highest incomes significantly overestimate their taxes paid (overestimation factor: 7.53, 1.95 and 2.73), while members of the upper income group underestimate their ATR (underestimation factor: 0.73). The 'middle-income' respondents accurately report their ATR.
Baik et al. (2016)	Corporate Income Tax	United States	Analysts and investors	217,987 firm-quarter observations	2002-2013	Archival Data Analysis	Do analysts' pre-tax income forecasts reduce investor mispricing of corporate income tax expense?	When analysts issue pre-tax income forecasts in addition to (after-tax) earnings forecasts, they implicitly provide a forecast of income tax expense. This implicit tax expense forecast reduces investor mispricing of corporate income tax expense.
Ballard and Gupta (2018)	Personal Income Tax	United States	Individuals	978	2013	Survey	Do individuals perceive their ATR correctly?	84.9% of respondents who report numbers overstate their ATR, on average, by 11.6 percentage points. This is an overestimation of actual ATRs by about 83%. The variety of misperceptions is extremely pronounced. More than one fifth of respondents do not know anything about their ATR.
Bartels (2005)	Personal Income Tax	United States	Individuals	1,511	2001-2003	Archival Data Analysis	Why has there been such a strong public support for the rather regressive 'Bush tax cuts'?	People support this regressive tax reform although they consider high-income households to pay too few taxes. Attitudes towards these tax cuts were shaped by self-interest rather than by preference for a progressive taxation.
Bartolome (1995)	Personal Income Tax	United States	MBA students	125	n/a	Lab Experiment	Do people use the MTR or the ATR when making economic decisions?	There are at least as many individuals who use the ATR 'as if' it was the MTR as individuals who use the true MTR. The cause of the widespread use of the ATR is shown to be the presented tax table: almost

								all individuals use the true MTR if the tax table is redesigned to stress the marginal rate.
Bischoff and Kusa (2019)	Inheritance Tax	Germany	Citizens	1,255	2014-2015	Survey	Should inherited wealth beyond a certain amount be taxed?	Almost 60% of respondents reject an inheritance tax. The opposition to the taxation of inherited wealth can be explained by self-interest, redistributive preferences, and the adherence to traditional values. An overestimation of the inheritance tax burden is also positively associated with the opposition to this tax. The majority of respondents misperceive the inheritance tax as 51% of the respondents have the erroneous belief that a child inheriting €100,000 had to pay inheritance taxes.
Blaufus et al. (2015)	Personal Income Tax	Germany	Individuals	1,009	2008	Survey	How do individuals perceive ATRs for different income levels and their own MTR?	The majority of respondents misperceive ATRs significantly. ATRs for low incomes are substantially overestimated (10.8 percentage points), ATRs for high incomes are considerably underestimated (6.5 and 5 percentage points) and ATRs for medium incomes are accurately estimated. Misperception of one's own MTR is more pronounced but pattern remain the same. ATRs are often misperceived for MTRs. This occurs especially for respondents who underrate their MTR. In this group, 54% of respondents regard ATR and MTR as being equal.
Bratten et al. (2017)	Corporate Income Tax	United States	Analysts	321,225 analyst-firm-quarters	2003-2014	Archival Data Analysis	How do analysts incorporate and improve on forecasts provided by management?	Analysts pay attention to taxes. They incorporate and improve on management ETR forecasts. However, discrete items impair the forecast value of management ETR estimates.
Brown (1969)	Personal Income Tax	Scotland	Workers and managers	232 (179 workers and 53 managers)	1966-1967	Survey	Do Scottish workers and managers perceive their MTR correctly?	None of the workers and only 6% of the managers report correct MTRs and only 20% of the workers and 23% of the managers reported roughly accurate numbers. MTR overestimates outnumber underestimates in both groups. The most striking difference between both groups is that 40% of the managers in contrast to 15% of the workers report a MTR which equals approximately the standard tax rate on unearned income (e.g. dividends or interest).

Brushwood et al. (2019)	Corporate Income Tax	United States	Firms	1,272	2015-2016	Archival Data Analysis	What is the effect of ASU 2016-09 on the accuracy of analysts' ETR forecasts?	Errors in analysts' ETR forecasts significantly increase among firms that were most affected by ASU (Accounting Standards Update) 2016-09. Among firms reporting a material ETR effect due to early adoption of ASU 2016-09, analysts' ETR forecast errors increased by approximately 0.94 percentage points, representing an approximate 24.7 percent increase in ETR forecast errors relative to the pre-adoption period.
Cabral and Hoxby (2012)	Excise Tax	United States	Individuals	559	1980, 1990, 2000	Survey	How does salience affect property tax rates and limits?	Tax escrow reduces salience and leads to a less accurate perception of the property tax burden. Salience decreases proper tax rates and increases the likelihood of the introduction of property tax limits.
K. C. W. Chen et al. (2003)	Corporate Income Tax	United States	Firms	114	1993-III	Archival Data Analysis	How are earnings forecasts revised following the disclosure of firms' 1993-III deferred tax adjustments?	Income-decreasing deferred tax adjustments are positively related to subsequent forecast revisions. This suggests that many analysts incorrectly interpret the deferred tax adjustment as a recurring item.
Chetty et al. (2009)	Excise Tax	United States	Individuals		2005-2006	Field Experiment	Do consumers react consistently to taxes that are not salient?	Posting tax-inclusive price tags reduces demand by 8%. Increases in taxes included in posted prices reduce alcohol consumption more than increases in taxes applied at the register.
Chirvi and Schneider (2020)	Wealth Taxes	United States	Individuals	2,101	2018	Non-incentivized Survey Experiment	How high do U.S. residents estimate the share of citizens that had to pay estate tax?	Preferences for the taxation of wealth depend on personal characteristics of respondents and the tax design. Regarding the existing estate tax, respondents estimated on average that the share of citizens that had to pay estate tax is about 40%, which is overestimated, as the correct share would have been lower than 0.1%. Republicans, who oppose the estate tax, perceive the share significantly worse than Democrats.
Chychyla et al. (2017)	Corporate Income Tax	United States	Firms and analysts	1) 29,112 firm-year observations 2) 7,445 firm-year observations	2002-2015	Archival Data Analysis	What are the causes and consequences of the effective tax rate reconciliation presented in the footnotes to companies' annual reports (10-K)?	1) Consistent with the political cost argument, it is shown that firms with lower (higher) taxes relative that their pre-tax income, tend to reconcile ETRs in dollar amounts (percentages). 2) Analysts' forecasts of ETRs tend to be more accurate for firms that present reconciliations in percentages than in dollars.

Dietrich et al. (2008)	Corporate Income Tax	Sweden	Firms	95	2004	Survey	How do Swedish investors perceive the tax burden in Germany compared to Austria?	Swedish firms state similar tax rates for investments in both countries, although the effective tax burden in Germany is significantly higher than in Austria. This implies that Swedish firms tend to perceive nominal rates rather than effective tax rates.
Eberhartinger et al. (2020)	Personal/ Corporate Income Tax	Austria	Individuals	304	2019	Lab Experiment	How does interpersonal trust and trust in government affect the bargaining behavior between tax auditor and taxpayer?	A high level of interpersonal trust leads to more concessionary tax bargaining behavior by the tax auditor. The auditee shows more concessionary behavior during tax bargaining when her trust in government is high.
Enrick (1963)	Personal Income Tax	United States	Individuals	217	1961-1962	Survey	What do people think is their total amount of federal income tax paid in a certain year?	Slight tendency of taxpayers to underestimate their tax burden rather than to overestimate (56.7% versus 37.7%), a considerable degree of error of estimation in general, and inability to demonstrate a differential effect of withholding taxes.
Enrick (1964)	Personal Income Tax	United States	Individuals	90	1963	Survey	How aware of income taxes are individuals in the United States?	Taxpayers are not fully aware of the taxes they pay. It appears that taxpayers may be under a certain degree of illusion as regards the full extent of their annual federal income tax burdens.
Ferber (1954)	Excise Tax	United States	Individuals	166	1954	Survey	How aware are consumer of excise tax changes?	Respondents' knowledge of excise tax changes was neither widespread nor accurate. The proportion of respondents who are aware of a tax change was no higher than 30%, in the case of luggage, and was as low as 16% in the case of refrigerators.
Finkelstein (2009)	Excise Tax	United States	Individuals	576	2004-2007	Survey	Does the salience of a tax system affect equilibrium tax rates?	Under Electronic Toll Collection, driving becomes less elastic with respect to the toll and the toll setting becomes less sensitive to the electoral calendar.
Fisher and Wassmer (2017)	Excise Tax	United States	Individuals	1) 600 2) 1,241	2014	Survey	Does perception of the rate and amount of fuel taxes paid by an individual influence his or her support for funding highway improvements from any source of revenue?	Car drivers often overestimate the rate of their state's gasoline excise tax and their monthly tax burden. This misperception affects car drivers' view on an increase in funding to support highway investments. An overestimation of the gasoline tax is associated with a lower willingness to pay for road improvements.
Fujii and Hawley (1988)	Personal Income Tax	United States	Individuals	3,197	1983	Survey	How accurate are estimates of the personal MRT of the federal income tax?	About 2/3 of respondents were able to provide MTR estimates and underrate their MTR, on average, by about 3 percentage points (22.71% perceived versus 25.99% actual MTR). About one third of respondents are not able to guess their MTR.

Gemmell et al. (2003, 2004)	Personal Income Tax/ Excise Tax	United Kingdom	Individuals	780	1995	Survey	Do respondents misperceive their MTR?	32-44% of respondents report an accurate MTR. The remaining respondents exhibit a substantial bias towards an overestimate although there are also many respondents underestimating their MTR.
Gensemer et al. (1965)	Personal Income Tax	United States	Individuals	865	1964	Survey	Are high-income earners in the U.S. aware of their MTR?	27% of respondents are unaware of their MTR. Other numbers on perceptions are not given. Amongst other variables, 'income' and 'education' explain the accuracy of MTR perceptions.
Gideon (2014)	Personal Income Tax	United States	Individuals	348	2011, 2013	Survey	How do individuals perceive their ATR and their MTR?	Respondents overestimate their ATR across the income distribution, on average by about 6.3 percentage points, with a more pronounced heterogeneity in the bottom quartile of cognitive ability. One's own MTR is fairly accurately estimated, at the mean, but people with low incomes overestimate their MTR whereas the opposite holds for people at higher incomes. Measurement errors due to misreported income do not alter the results.
Gideon (2017)	Personal Income Tax	United States	Individuals	748	2011	Survey	Do individuals perceive their ATR and MTR correctly?	Respondents, on average, overestimate their ATR while they underestimate their MTR. MTRs are overestimated by respondents with lower income and underestimated by those with higher income. Respondents underestimate the top MTR on wage and salary income and overestimate the MTR on (preferentially taxed) dividend income. Respondents underestimate the tax schedule progressivity.
Gleason et al. (2018)	Corporate Income Tax	United States	Firms	2,798 firm-year observations	2003-2014	Archival Data Analysis	What is the impact of FIN 48 on the financial reporting quality of tax reserves?	Firms, on average, adequately use tax reserves for IRS tax assessments before and after FIN 48. The introduction of FIN 48 improves the comparability of accounting for tax reserves between firms with and without auditor-provided tax services.
Graham et al. (2017)	Corporate Income Tax	United States	Corporate tax executives	500	2006	Survey and Archival Data Analysis	Which tax rate input do corporate executives use in decisions? What are the consequences of using incorrect tax rate inputs?	Most public companies use GAAP ETR, while most private companies use STR. Using an ETR input results in non-optimal capital structure and investment sensitivity.

Hoopes (2018)	Corporate Income Tax	United States	Analysts and investors	22,140 firm-year observations	1997-2011	Archival Data Analysis	Does the expiration of temporary tax laws affect capital market participants' ability to understand and forecast earnings?	Analysts' forecast errors are larger for R&D credit firms in quarters when the R&D credit expired. The results suggest analysts have difficulties understanding the effects of R&D tax credit on earnings. Additional information as earnings guidance provided by managers mitigate the effect.
Hoppe et al. (2020)	Corporate Income Tax	Multinational	Tax consultants	993	2016	Survey	How does tax complexity vary across countries and what are the main drivers of tax complexity? Is tax complexity associated with other country characteristics?	The overall level of tax complexity varies considerably across countries. Main drivers of tax complexity are the complexity of the transfer pricing regulations, in particular the documentation requirements and the ambiguity of the regulations, as well as the complexity of the tax audits, in particular by long limitation periods and inconsistent decisions by tax officials. Associations between tax complexity and other country characteristics are not very strong.
Hundsdoerfer and Sichtmann (2009)	Personal Income Tax	Germany	Individuals	131	2006	Survey	Do self-employed physicians know their marginal tax rate? Are tax aspects overweighted in entrepreneurial decision-making?	About one quarter of participants do not know their MTR. Participants overweight tax aspects in their decisions.
Hüsing (1999)	Personal/ Corporate Income Tax	Germany	Firms	76	1989-1993	Survey	To what extent are tax aspects integrated in investment planning processes of SMEs?	The majority of firms (59%) do not use investment calculations which are suitable for tax considerations. The consideration of taxes for investment decisions depends on the personality of the decision-maker (i.e. personal tax consequences, tax knowledge, and experience).
Kim et al. (2020)	Corporate Income Tax	United States	Analysts	7,839	1994-2017	Archival Data Analysis	To what extent do analysts incorporate tax-based earnings information in their earnings forecasts relative to other earnings information?	Analysts misunderstand tax-based earnings information to a greater extent than other earnings information. However, a strong information environment of firms reduces analysts' forecast errors for tax-based earnings information.
Kling (1992)	Personal/ Corporate Income Tax	Germany	Firms/Tax Consultants	217 (158 firms and 59 tax consultants)	1987	Survey	How do tax depreciations affect the investment behavior of firms?	Firms primarily aim at getting depreciation-induced tax savings from their investments.

Kuziemko et al. (2015)	Capital Income Tax	United States	Individuals	10,000	2012	Non-incentivized Survey Experiment	What are the views of individuals on U.S. income inequality and what is the link between top income tax rates and economic growth, and the estate tax?	Giving information on inequality has significant effects on views about inequality but only slightly moves tax and transfer policy preferences. An exception is the estate tax: Informing respondents of the small share of decedents who pay it doubles support for it.
Lagarden et al. (2020)	Corporate Income Tax	Europe			n/a	Theoretical Analysis	Can public CbCR reduce information asymmetries between MNEs and the general public they operate in?	By employing the sender-signal-receiver framework, the authors conclude that the introduction of public CbCR does not necessarily improve transparency, as the general public might misunderstand it and question it through tax morale rather than tax law.
Lewis (1978)	Personal Income Tax	United Kingdom	Individuals	200	1977	Survey	How much has to be paid in taxes for an extra pound in income?	British taxpayers, on average, tend to underestimate MTRs over the whole income range by approximately 11% for each income bracket. The misperception is lower for MTRs close to respondents' own income bracket. About 10% of respondents fail to report numbers on MTRs.
Plumlee (2003)	Corporate Income Tax	United States	Analysts	355	1984-1988	Archival Data Analysis	To what extent do analysts' effective tax rate forecasts incorporate information related to six tax law changes of varying complexity?	The magnitude of errors in analysts' ETR forecasts increases with complexity in tax-law changes. Analysts are able to fully incorporate less complex but not more complex information in their ETR forecasts.
Rees-Jones and Taubinsky (2019)	Personal Income Tax	United States	Individuals	4,197	2015	Incentivized Survey Experiment	Which heuristic do individuals use to approximate the tax schedule?	Respondents' estimates on the tax burden of several given incomes reveal a perception of the tax schedule similar to but more linear than the true tax schedule. On average, actual tax rates are overestimated. However, while tax burdens for low income levels are overestimated, the opposite holds true for higher incomes. The higher the income of respondents, the higher the income at which respondents tend to reverse overestimation into underestimation.
Robinson et al. (2016)	Corporate Income Tax	United States	Firms	1) 16,436 firm-year observations 2) 16,241 firm-year observations	2007-2011	Archival Data Analysis	Does FIN 48 change the relevance of income tax accounting?	FIN 48 does not increase the relevance of accounting for income taxes because (1) tax reserves do not exceed cash settlements more after FIN 48 than before, and (2) the predictive value of tax expenses for future tax cash outflows even decreases.

Rupert and Fischer (1995)	Personal Income Tax	United States	Individuals	108	1994	Survey	Are U.S. taxpayers aware of their MTR?	On average, there is a slight MTR overestimate of some more than 3 percentage points (if absolute values of MTR misperception are used overestimates, on average, amount to more than 8 percentage points). Less than 10% of respondents perceive their MTR correctly whereas 60% overestimate and 32% underestimate their MTR by nearly 10 and 8 percentage points respectively.
Schmölders (1960)	Personal Income Tax	(West) Germany	Individuals		1958	Survey	How do German individuals perceive their own income tax burden?	About 50% of respondents overestimate their tax burden, around 20% underestimate their tax burden and nearly one third hold accurate beliefs. Significantly less farmers and sole proprietors are able to provide accurate estimates than employees are. The majority of farmers (55%) and sole proprietors (64%) overestimate their average tax burden.
Sides (2016)	Estate Tax	United States	Individuals	1,829	2007-2008	Non-incentivized Survey Experiment	How much do factual information and other kinds of frames affect policy attitudes?	Respondents expect on average 21% of all Americans to 'have a large enough estate to be subject' to the estate tax. Regarding attitudes towards the estate tax, Republicans, and in particular those with lower incomes, were most affected by exposure to correct information about the tax.
Slemrod (2006)	Personal Income Tax	United States	Individuals	1,339	2002	Archival Data Analysis	Why do people support an apparently regressive reform?	People misperceive the current U.S. income tax as regressive.
Schwenk (2003)	Corporate Income Tax	Germany	Firms	50	2000	Survey	How do firms perceive tax advantages of German GAAP?	Current value tax depreciations or provisions are not perceived as tax advantages. More than one third of corporations do not consider taxes when making investment decisions at all.
Taubinsky and Rees-Jones (2018)	Excise Tax	United States	Individuals	2,998	2016	Incentivized Survey Experiment	How do consumers react to non-salient sales taxes?	Consumers underreact to non-salient sales taxes. Consumers in the study react to existing sales taxes as if they were only 25% of their size.
Thomas and Zhang (2011)	Corporate Income Tax	United States	Investors	604,067 firm-year observations	1977-2006	Archival Data Analysis	Do the following two hypotheses hold jointly? An unexpected increase in tax expense represents good news and that information is reflected in stock prices with a delay.	An unexpected increase in tax expense is positively associated with next quarter's stock returns. There are two channels for the delayed market response: Quarterly tax expense surprise predicts next quarter's surprises for (1) earnings and (2) tax expense. The authors conclude that investors do not fully assess the change in tax expense.

TNS Opinion & Social (2015)	Excise Tax	EU28 European Member States	Individuals	27,868	2014	Survey	What knowledge do Europeans have of VAT levels in their country and what importance do citizens attach to VAT as a source of public revenue?	Nearly two-thirds (65%) of European citizens were able to correctly cite their national standard VAT rate.
Van Wagstaff (1965)	Personal Income Tax	United States	Employers	1162	n/a	Survey	To what extent is the American public conscious about income tax?	Some more than 10% of respondents hold accurate beliefs about their tax burden. Underestimates and overestimates are almost balanced (42.9% versus 44.5%). Employees in lower income groups tend to overestimate whereas in higher income groups there is a tendency to underestimate. Respondents' estimates exhibit a substantial dispersion.
D. P. Weber (2009)	Corporate Income Tax	United States	Firms and analysts	14,211 firm-year observations	1984-2004	Archival Data Analysis	Do two types of market participants, equity investors and sell-side financial analysts, use book-tax differences (BTDs) information to form efficient earnings expectations and is the association between BTDs and future stock returns due to mispricing or omitted risk factors?	Analysts' forecasts of future earnings tend to be overoptimistic when book income is high relative to tax income. Regarding investors, the relation between BTDs and future returns (1) is concentrated among firms with weaker information environments, (2) is not significant anymore when controlling for analysts' forecast errors. Both indicates mispricing due to BTDs.
Williamson (1976)	Personal Income Tax	United States	Individuals	375	1972	Survey and Archival Data Analysis	What is the ATR of families with different income levels?	Respondents significantly overestimate ATRs for each of the three income categories. Both the percentage of respondents overestimating ATRs (about 70%) and the magnitude of ATRs overestimates (about 11 percentage points) do not differ considerably between the three income groups.
Wittmann (1986)	Personal/ Corporate Income Tax	Germany	Entrepreneurs and Manager	209	1980	Survey and Archival Data Analysis	Do firms consider taxes in their investment decision-making?	Only 7% of firms use the appropriate MTR input, and only 7% uses the correct depreciation rate.

Appendix Table A2: Effect of Tax Misperception on Decision-Making

Reference	Tax Type	Country	Subject Pool	Sample Size	Survey Year	Research Design	Research question	Results
Abeler and Jäger (2015)	Personal Income Tax	United Kingdom	Individuals	277	n/a	Lab Experiment	How does complexity affect people's reaction to tax changes?	Subjects in the complex treatment underreact to new taxes; some ignore new taxes entirely. The underreaction is stronger for subjects with lower cognitive ability. Contrary to predictions from models of rational inattention, subjects are equally likely to ignore large or small incentive changes.
Ackermann et al. (2013)	Personal Income Tax	Germany	Students	119	n/a	Lab Experiment	How do taxes and subsidies affect portfolio choices?	Compared to a net-equivalent no-tax setting, the willingness to invest in a risky asset decreases markedly when an income tax has to be paid or when a subsidy is received.
Alstadsæter and Jacob (2017)	Personal/Corporate Income Tax	Sweden	Individuals/ Corporations	7,190,676 442,712	2002-2009	Archival Data Analysis	Why do not all individuals participate in tax avoidance?	In addition to monetary benefits from tax avoidance (incentives), the opportunity to participate in tax avoidance (access), as well as information and knowledge about these opportunities (awareness), are important factors for the individual's tax avoidance decision. Tax avoidance spreads within communities.
Amberger et al. (2016)	Corporate Income Tax	Austria	1) Students 2) Tax professionals	1) 141 2) 62	n/a	Lab Experiment	Does a decision bias reduce the quality of corporate tax-planning decisions?	Decision-makers overestimate the relevance of less complex tax-rate information compared to more complex tax-base information. Tax-planning choices are unaffected by participants' professional experience. Time constraints impede the use of complex information which can result in suboptimal tax planning.
Arrazola et al. (2000)	Personal Income Tax	Spain	Married men	1,406	1994	Survey	Misperception of marginal tax rates	Prominent divergences occur between subjective perception and formal income tax rates.
Bach (2015)	Corporate Income Tax	France	Corporations	915,000 firm year observations	1996-2007	Archival Data Analysis	Why do firms react differently to avoidance incentives given by non-linear taxes and regulations?	Tax elasticities reflect in great part the speed of tax code learning by firms and more profitable firms learn faster.
Bartolome (1995)	Personal Income Tax	United States	Students	125	n/a	Lab Experiment	Do people use the MRT or the ART when making economic decisions?	There are at least as many individuals who use the average tax rate 'as if' it were the marginal tax rate as individuals who use the true marginal tax rate. The cause of the widespread use of the average tax rate is shown to be the presentation of the tax table: almost

								all individuals use the true marginal tax rate if the tax table is redesigned to stress the marginal rate.
Beshears et al. (2017)	Personal Income Tax	United Kingdom	Employees	1) 5,552 2) 7,000	1) 2006 - 2010 2) 2014	1) Archival Data Analysis 2) Non-incentivized Survey Experiment	Can governments increase private savings by taxing savings up front instead of in retirement?	No evidence that total 401(k) contribution rates differ between employees hired before versus after Roth introduction, which implies that take-home pay declines and the amount of retirement consumption being purchased by 401(k) contributions increases after Roth introduction.
Blaufus et al. (2013)	Personal Income Tax	Germany	1) Working individuals 2) Employees	1) 467 2) 56	1) 2008/2009 2) 2011	1) Non-incentivized Survey Experiment 2) Lab Experiment	How do changes in the tax rate and the tax base influence the perceived tax burden?	The majority of individuals do not make rational tax decisions based on the actual tax burden but rather use simple decision heuristics. This leads to an irrationally high impact of changes in nominal tax rates on the perceived tax burden.
Blaufus and Milde (2020)	Personal Income Tax	Germany	Students	722	2016, 2017, 2019	Lab Experiments	How do tax misperceptions affect individuals' retirement savings and do informational tax nudges and the form of the tax subsidy promote tax responses that are in line with rational choice predictions?	Deferred taxation results in after-tax pensions that are approximately 25% lower compared to an economically equivalent immediate pension tax system. Tax misperceptions nearly disappear for all subjects only if recurrent numerical informational pension tax nudges are provided and if subjects have gained experience. Replacing the tax deductibility of retirement savings with government matching contributions increases after-tax pensions above the level under immediate taxation without the need to provide informational tax nudges.
Blaufus and Möhlmann (2014)	Personal Income Tax	Germany	Students	110	2008, 2009	Lab Experiment	How does tax aversion affect the behavioral responses to differently taxed securities?	Initial overvaluation of tax payments diminishes when subjects gain experience. The tax deduction of expenses is valued more than an equivalent tax exemption of earnings. The persistence of the tax aversion bias critically depends on the quality of feedback.
Blaufus and Möhlmann (2016)	Wealth/ Income Tax	Germany	Students	136	2013	Lab Experiment	Does a wealth tax discourage risk-taking in comparison to an income tax?	There is higher risk taking in the case of a wealth tax compared to a net equivalent income tax. This result is in line with a proposed behavioral perception bias, an income effect based on a less salient wealth tax burden, leading to more risk-taking with a wealth tax.

Blaufus and Ortlieb (2009)	Personal Income Tax	Germany	Students	983	2006, 2007	Non-incentivized Survey Experiment	Does tax complexity influence employees' decisions concerning company pension plans?	If tax complexity is high, then only a small proportion of the study participants base their decision on their after-tax return. This proportion increases significantly if tax complexity is low.
Blumkin et al. (2012)	Excise/ Income Tax	Israel	Students	80	2010	Lab Experiment	Do a labor-income tax and an equivalent consumption tax lead to identical labor-leisure allocations?	Subjects reduce their labor supply significantly more in response to an income tax than to an equivalent consumption tax.
Boylan (2013)	Personal Income Tax	United States	Students	70	n/a	Lab Experiment	How does tax rate transparency affect decisions of individuals who transact in a competitive environment?	A lack of tax rate transparency has a negative effect on profits earned in the markets. Greater transparency leads to higher profits for those who had access to the information about the relevant tax rate. The effect of greater transparency spills over to those who did not have access to tax rate information.
Boylan and Frischmann (2006)	Personal Income Tax	United States	Students	42	n/a	Lab Experiment	To what extent does the complexity in determining one's marginal tax rate produce decision errors in single-person investment settings in which individuals must choose between investments with different after-tax returns when investments are made in competitive markets?	First, tax complexity leads to systematically (and inefficiently) high trading prices and quantities in these markets, which jointly limits the amount of wealth created, and leads to systematic wealth transfers between market participants and the taxing authority. Second, these effects generally diminish over the course of the experiment but do not disappear entirely.
Brännäs and Karlsson (1996)	Personal Income Tax	Sweden	Individuals	726	1981	Survey	Does the perceived tax scale differ from the true one?	The differences between the true and estimated tax scales are found to be small.
Chambers and Spencer (2008)	Personal Income Tax	United States	Students	141	n/a	Non-incentivized Survey Experiment	Will tax refunds administered as one lump-sum be saved (vs. spent) more than tax refunds of the same amount refunded monthly through revised income tax withholding tables?	A refund delivered in monthly amounts stimulated current spending more than if the same yearly total tax reduction was delivered in one lump-sum.
Chetty et al. (2009)	Excise Tax	United States	Individuals		2006	Field Experiment and Archival Data Analysis	Do consumers react consistently to taxes that are not salient?	Posting tax-inclusive price tags reduces demand by 8%. Increases in taxes included in posted prices reduce alcohol consumption more than increases in taxes applied at the register.

Chetty et al. (2014)	Personal Income Tax	Denmark	Individuals	4 Million individuals	1995-2009	Archival Data Analysis	Do retirement savings policies raise total wealth accumulation or simply induce individuals to shift savings across accounts?	Approximately 15% of individuals are 'active savers' who respond to tax subsidies primarily by shifting assets across accounts; 85% of individuals are 'passive savers' who are unresponsive to subsidies but are instead heavily influenced by automatic contributions made on their behalf. Active savers tend to be wealthier and more financially sophisticated.
Cuccia et al. (2017)	Personal Income Tax	United States	Individuals	1. 283 2. 293 3. 328	n/a	1. Non-incentivized Survey Experiment 2. Non-incentivized Survey Experiment 3. Incentivized Survey Experiment	What are economic and non-economic determinants of the choice between deferred-taxed and immediate-taxed pension plans?	In general, individuals prefer immediate-taxed over deferred-taxed pension plans. Tax rate changes had no impact on plan choice when subjects were neither educated on the economic impact of tax rate changes in advance nor experimentally prompted with information about the change.
Djanali and Sheehan-Connor (2012)	Personal Income Tax	United States	Students	66	n/a	Lab Experiment	Do individuals derive non-negligible utility from paying taxes due to their pro-social tendencies?	Subjects worked more in the presence of tax than in its absence at the same net wage rate. The impact of wage changes on labor supply depended not only on the after-tax wage rate, but also on the tax rate.
Eberhartinger et al. (2020)	Personal/ Corporate Income Tax	Austria	Individuals	304	2019	Lab Experiment	How does interpersonal trust and trust in government affect the bargaining behavior between tax auditor and taxpayer?	A high level of interpersonal trust leads to more concessionary tax bargaining behavior by the tax auditor. The auditee shows more concessionary behavior during tax bargaining when her trust in government is high.
Epley et al. (2006)	Personal Income Tax	United States	1) Individuals 2) Students	1) 58 2) 116	1) 2002	1) Field Experiment 2) Lab Experiment	Do subjects spend more if a tax reduction is framed as a bonus instead of a tax rebate?	People are more likely to spend income framed as a gain from a current wealth state than income framed as a return to a prior state.
Fahr et al. (2014)	Personal Income Tax.	Germany	Students	208	2012	Lab Experiment	How do tax rate changes affect investment timing in the presence of risk as well as entry and exit flexibility?	While the presence of an exit option seems to be irrelevant for investment timing in the case of an experienced tax rate decrease, it affects investment timing in the case of a tax rate increase.

Falsetta and Tuttle (2011)	Personal Income Tax	United States	Students	89	n/a	Lab Experiment	Do taxes still matter in situations in which investments have no tax consequences?	The year-end tax position (tax refund or tax payment) can alter taxpayers' investment strategies, even when stock transactions have no economic tax effect.
Falsetta et al. (2013)	Personal Income Tax	United States	Students	117	n/a	Field Experiment	How do the effects of timing (gradual versus immediate) and direction (tax increase or decrease) of a tax change affect taxpayer behavior?	A tax decrease implemented gradually over several years will result in a greater increase in risky investment once the decrease is fully implemented than when the tax change is implemented all at once. In contrast, once a tax increase (a 'loss') is fully implemented, a smaller decrease in risky investment results when the change occurs all at once rather than gradually.
Feldman and Ruffle (2015)	VAT	Israel	Students	180	n/a	Lab Experiment	How does consumer demand respond to price components that are deducted at the register such that the final price is below the initial price?	Subjects spend about 25% more under tax-exclusive prices whereas total purchases under tax-inclusive and tax-rebate prices are similar.
Feldman et al. (2018)	Sales Tax	United States	Students	227	n/a	Lab Experiment	Does a 'salience effect' depend on the magnitude of the tax?	There is no evidence that salience effects decline as the tax rate increases.
Fochmann and Hemmerich (2018)	Personal Income Tax	Germany	Students	79	2013	Lab Experiment	How does a proportional income tax (with and without full loss offset) affect investment behavior?	The willingness to invest in the risky asset decreases when the income is subject to a tax. This result holds irrespective of whether a full loss offset or no loss offset is provided. The riskily invested amount in the full-loss-offset is higher compared to a no-loss-offset treatment.
Fochmann et al. (2016)	Personal Income Tax	Germany	Students	94	2014	Lab Experiment	How are perceived risk and emotional reactions to taxation related to the occurrence of tax perception biases?	Perceived risk is lower and willingness to take risk is higher with a capital gains tax (with full loss offset provision) than without taxation. The positive effect on risky investment is higher in a situation with a rather low level of tax information in which tax complexity is high and tax salience is low.
Fochmann et al. (2017)	Personal Income Tax	Germany	Students	72	2012	Lab Experiment	How is decision-making affected by emotional and cognitive reactions to different tax regulations?	A loss offset provision increases the willingness to take risk whereas a tax on gains decreases risk-taking. There is a highly significant influence of valence perception on choice patterns.

Fochmann and Jacob (2015)	Personal Income Tax		Investors		n/a	Theoretical Analysis	Why do loss offset restrictions exist and to what degree do loss aversion and risk attitude affect the degree of a loss offset restriction?	If investors are (1) more risk averse in case of gains, (2) less risk seeking in case of losses, or (3) more loss averse, loss offset rules should be more restrictive.
Fochmann and Kleinstück (2014)	Personal Income Tax	Germany	Students	84	2010	Lab Experiment	Are we willing to accept a reduced income only to save on taxes? (tax aversion)	There is no evidence for the existence of tax aversion.
Fochmann et al. (2012a)	Personal Income Tax	Germany	Students	126	n/a	Lab Experiment	To what extent are investors' choices affected by a biased perception of income taxation?	Aggregated income taxation with complete loss deduction induces a sustained bias towards more risky investment decisions, while disaggregated income taxation does not.
Fochmann et al. (2012b)	Personal Income Tax	Germany	Students	91	n/a	Lab Experiment	To what extent are investors' choices affected by limited loss deduction in income taxation?	Partial and capped loss deduction increase risk taking.
Fochmann and Weimann (2013)	Personal Income Tax	Germany	Employees	245	n/a	Field Experiment	How is the work-leisure decision affected by tax?	For constant net wages, the effort is significantly higher under the tax than in the no tax treatment. Tax perception depends on the tax rate, the presentation of the tax and the experience subjects have with taxation.
Fochmann et al. (2013)	Personal Income Tax	Germany	Employees	127	n/a	Lab Experiment	How is the work-leisure decision affected by tax?	Subjects worked harder and longer when they were taxed (net wage illusion effect). Not only the tax rate and the tax base are important for work incentives, but also the perception of a tax.
Goldin and Homonoff (2013)	Excise/ Sales Taxes	United States	Individuals over 18	1.3 million	1984-2000	Archival Data Analysis	Should governments levy commodity taxes at the register or include them in a good's posted price?	Whereas all consumers respond to taxes that appear in cigarettes' posted price, the results suggest that only low-income consumers respond to taxes levied at the register.
Goupille-Lebret and Infante (2018)	Inheritance Tax	France	Individuals	343,869	2003-2013	Archival Data Analysis	What is the impact of inheritance taxation on wealth accumulation?	Results cannot be explained by an absence of tax salience and are not consistent with forward-looking individuals' decisions. In contrast, results are consistent with the existence of psychological biases such as myopia and denial of death.

Graham et al. (2017)	Corporate Income Tax	United States	Corporate tax executives	500	2006	Survey and Archival Data Analysis	Which tax rate inputs do corporate executives use in decisions? What are the consequences of using incorrect tax rate inputs?	Most public companies use GAAP ETR, while most private companies use STR. Using an ETR input results in non-optimal capital structure and investment sensitivity.
Hayashi et al. (2013)	Personal Income Tax	United States	Mostly students	1) 150 2) 148	1) 2009 2) 2012	Lab Experiments	Does different wage framing have an impact on the decision to choose work rather than leisure activity?	Subjects are less willing to work both when their wages are partitioned with positive and with negative surcharge components (compared to all-inclusive prices).
Hlouskova and Tsigaris (2012)	Capital Income Tax		Investors		n/a	Theoretical Analysis	What are the effects of a proportional capital income taxation on risk taking as well as its effects on public and private sector risk for a sufficiently loss averse investor?	The effects of taxation are demonstrated based on some reasonable reference levels such as one's current asset position, or reference levels set at the gross after tax safe return from investing initial wealth. Under these cases, a capital income tax does not affect risk taking even if the tax code offers attractive loss offset provisions.
Hundsdoerfer and Sichtmann (2009)	Personal Income Tax	Germany	Self-employed physicians	131	2006	Survey	Do self-employed physicians know their MTR? Are taxes overweighted in entrepreneurial decision-making?	About one quarter of participants do not know their MTR. Participants overweight tax aspects in their decisions.
Kessler and Norton (2016)	Personal Income Tax	United States	Students	325	2012	Lab Experiment	How does labor supply react to taxation?	The productivity decrease that arises from taxation is 40% due to the lower net wage and the remaining 60% to tax aversion. Tax aversion affects labor supply more on the extensive margin (working less) than on the intensive margin (being less productive while working). Tax aversion is equally strong whether tax revenue goes to the U.S. government or back to the experimenter (a 'laboratory tax').
König et al. (1995)	Personal Income Tax	Germany	Individuals	between 1,068-1,328 observations per year	1985-1989	Survey	To what extent do consumers perceive their true marginal tax rate when they make their labor supply decisions? How does the perception of the marginal tax rate differ among various socio-economic groups?	The assumption of complete knowledge of the tax system does not fit the data well, and education appears to be the main determinant for a correct perception of the marginal tax rate.

Kopczuk (2007)	Estate Tax	United States	Individuals	40,462	1969-1977	Archival Data Analysis	Do wealthy individuals change their behavior shortly before death regarding the estates reported on tax returns?	The presence of significant tax motivated actions following the onset of a terminal illness reveals a desire to control disposition of assets, but it also implies that more tax planning could have been pursued earlier. Procrastination in estate planning is an important phenomenon.
Lozza et al. (2010)	Personal Income Tax	Italy	1) Individuals 2) Taxpayers	1) 2,000 2) 252	n/a	1) Survey 2) Lab Experiment	Is presenting a fiscal bonus as an income increase (a gain) the same as presenting it as a tax rebate (a loss reduction)?	Respondents attached a higher importance to the bonus and were keener to save it when it was described as a loss reduction, compared to it being presented as a gain.
McCaffery and Baron (2003)	Personal Income Tax	United States	Individuals	188	n/a	Non-incentivized Survey- Experiment	Are attitudes toward tax regimes subject to disaggregation bias and a metric effect?	Subjects focused on the tax component they were asked to manipulate and did not respond fully to changes in the other components of the tax system. In addition, subjects preferred higher rates of graduation when tax burdens were stated in percent terms rather than in dollars.
Mehrmann and Sureth-Sloane (2017)	Personal Income Tax		Individuals		n/a	Theoretical Analysis	What are the effects of tax loss offset restrictions on the evaluation of risky investments under bounded rationality of decision-makers?	Taxation of gains and losses leads to ambiguous tax effects, even under complete loss offset, for investors with bounded rationality.
Möhlmann (2013)	Personal Income Tax	Germany	Students	49	2012	Lab Experiment	Are investors concerned about the country benefiting from a tax?	The results suggest that investors prefer domestic equity and invest in riskier portfolios in case of a foreign tax rather than a domestic tax on foreign dividend income.
Olsen et al. (2019)	VAT	United Kingdom United States	Individuals	U.S.: 590, UK: 595	2018	Non-incentivized Survey Experiment	Are consumption taxes really disliked more than equivalent costs?	Tax aversion in hypothetical consumption decisions seems to be a smaller phenomenon than originally proposed and does not generalize to a value added tax system.
Rosen (1976a)	Personal Income Tax	United States	Individuals	2,545	1967	Survey	How do taxes affect labor supply considering potential tax misperceptions?	Subjects do not suffer from tax illusion.
Rosen (1976b)	Personal Income Tax	United States	Individuals	2,545	1967	Survey	Do taxes have an impact on married women in the labor force?	Marginal tax rates have an important impact on labor force behavior.

Rupert et al. (2003)	Personal Income Tax	United States	Students	89	n/a	Lab Experiment	Is there an influence of tax rate complexity on understanding of marginal tax rates and investment decisions?	Decision performance was significantly better for participants facing the low complexity system than those in the medium or high complexity systems.
Rupert and Wright (1998)	Personal Income Tax	United States	Students	113	n/a	Lab Experiment	Does the visibility of the marginal tax rate affect taxpayers' decision-making?	Increased visibility of the rate structure significantly enhanced decision performance. Further, learning was most rapid for the high visibility conditions.
Sahm et al. (2012)	Personal Income Tax	United States	Individuals	2,952	2008-2009	Survey	Does the effectiveness of fiscal stimulus depend on how it is delivered?	The reduction in withholding in 2009 boosted spending at roughly half the rate (13%) as the one-time payments in 2008.
Sielaff and Wolf (2016)	Personal Income Tax	Germany	Students	96	n/a	Lab experiment	Is there an influence of tax rate complexity on individual labor supply?	Taxpayers' labor supply decreases with increasing tax rate complexity.
Stephens Jr and Ward-Batts (2004)	Personal Income Tax	United Kingdom	Individuals	10,000 households each year	1984-1998	Survey	What was the impact of the UK tax reform 1990 on the intra-household allocation of asset income?	Only 18 to 30% optimally allocated their assets.
Stinson et al. (2020)	Personal Income Tax	United States	Individuals	548	n/a	Incentivized Survey- Experiments	How does the timing of pension taxation affect the willingness to take risks?	When presented with a specific after-tax pension goal, investors with deferred-taxed pension plans invest less in high-return/high risk assets.
Sussman and Olivola (2011)	Sales Tax/ Personal Income Tax	United States	Individuals	1,845	n/a	Non-incentivized Survey- Experiments	Are taxes more disliked than equivalent costs?	People have a stronger preference to avoid tax-related costs than to avoid equal-sized (or larger) monetary costs unrelated to taxes.
Taubinsky and Rees-Jones (2018)	Excise Tax	United States	U.S adult	2,998	2016	Field Experiment	How do consumers react to non-fully salient sales taxes?	Consumers under-react to non-salient sales taxes. Consumers in the study react to existing sales taxes as if they were only 25% of their size.
Watrin and Ullmann (2008)	Personal Income Tax/Consumption Tax	Germany	Students	80	2006	Lab Experiment	Is compliance influenced by the framing of the taxes?	Median compliance is 10.2 percentage points higher in the income tax framing than in the consumption tax framing.
M. Weber and Schram (2017)	Personal Income Tax	Netherlands	Students	240	2012	Lab Experiment	What are the effects of a labor market tax levied on employers and a corresponding income tax levied on employees on labor supply?	Under employer-side taxes, labor supply is lower.

Zwick (2020)	Corporate Income Tax	United States	Firms	612,070	1998-2011	Archival Data Analysis	Does tax code complexity alter corporate behavior?	Only 37% of eligible firms claim their refund.

Appendix Table A3: Management of Tax Perception and Its Impact on Stakeholders

Reference	Tax Type	Country	Subject Pool	Sample Size	Survey Year	Research Design	Research question	Results
Akamah et al. (2018)	Corporate Income Tax	United States	Firms	2,698	1998-2010	Archival Data Analysis	Do multinational companies operating in tax havens tend to aggregate their geographical disclosures to a greater extent?	Multinational firms with higher activities in tax havens tend to aggregate their disclosures about their operations in tax havens to a higher degree to reduce the transparency of their tax avoidance activities. These results are stronger for larger firms with higher political costs, for firms in natural-resources industries, in retail industries, or with low competition.
Balakrishnan et al. (2019)	Corporate Income Tax	United States	Firms	40,193 firm-year observations	1990-2013	Archival Data Analysis	Does aggressive tax planning reduce corporate transparency?	Firms engaging in aggressive tax planning exhibit lower transparency. However, they tend to disclose more.
Baloria and Klassen (2017)	Corporate Income Tax	United States	Democratic and Republican congressional candidates	891	2012	Archival Data Analysis	Do firms affiliated with politicians through campaign contributions use accounting discretion during elections to avoid releasing politically damaging financial information?	Prior to elections, firms affiliated with tax cut supporting candidates increase their ETR by 3% on average relative to nonelection quarters and other-supporting firms. The results indicate that the variation in upward ETR management is correlated with firm-level proxies for potential reputational costs, capital markets costs, and long-run tax burdens.
N. Chen et al. (2019)	Corporate Income Tax	United States	Firms	44,383 firm-quarter observations	2006-2016	Archival Data Analysis	Why do firm that are subject to mandatory ETR forecasts disclose additional tax information voluntarily? To what extent do analysts' forecast revisions incorporate mandatory and voluntary ETR forecasts?	Managers are more likely to provide voluntary ETR forecasts when tax complexity is high. Analysts use both voluntary and mandatory ETR forecasts to inform their ETR forecast revisions but pay more attention to voluntary disclosures. The results indicate that non-GAAP, GAAP, and unspecified ETR-based forecasts are incrementally informative over mandatory ETR forecasts.
Chychyla et al. (2017)	Corporate Income Tax	United States	Firms	1) 5,413 - 2,400 2) 92	2002-2015	Archival Data Analysis Lab Experiment	What are the determinants and effects of the chosen disclosure format of ETR reconciliation?	Firms with low (high) ETRs tend to highlight the dollar (percentage) amount of their tax expense. One standard deviation increase in a firm's ETR increases the likelihood of the firm using the percentage format by 12.32%. This is more pronounced for firms with higher marginal political cost. Analysts seem to find the percentage format easier to use and tend to make

								smaller errors in their ETR forecasts when firms present their ETR reconciliation in the percentage format.
Demeré et al. (2019)	Corporate Income Tax		Firms	1,654 - 2,269	1996-2012	Archival Data Analysis	Does smoothing of GAAP ETRs via tax accruals affect financial reporting quality as measured by restatements and the ability of GAAP ETRs to predict future cash ETR?	GAAP ETR smoothing is negatively associated with the likelihood of restatements, especially for fraudulent reporting cases and tax-related restatements. On average, a one standard deviation increase in GAAP ETR smoothing is associated with a decrease in the likelihood of having a tax-related (non-tax-related) restatement by 12.8 (6.8)% conditional on the base likelihood. GAAP ETR smoothing is also associated with a decreased likelihood of tax-related fraud events by 47% conditional on the base likelihood.
Dyreng et al. (2016)	Corporate Income Tax	United Kingdom	Firms	77	1997-2012	Archival Data Analysis	Does public scrutiny lead to changes in firms' disclosure, corporate tax avoidance behavior and usage of subsidiaries in tax haven countries?	Noncompliant firms increase their subsidiary disclosures immediately following public pressure. Subsequent disclosures reveal disproportionately higher levels of tax haven usage compared to the previous incomplete disclosures. Following the public pressure period, there was a 2.7 percentage point increase in the ETRs of noncompliant firms in the years following the initial public pressure to comply with the subsidiary disclosure law.
Flagmeier and Müller (2019)	Corporate Income Tax	Germany	Firms	78	2005-2014	Archival Data Analysis	Do companies voluntarily disclose additional information on tax loss carryforwards if the recoverability is uncertain?	Companies with greater ex ante uncertainty about the tax loss usability voluntarily disclose more and more salient information about tax loss carryforwards.
Flagmeier et al. (2020)	Corporate Income Tax	Germany	Firms	70	2001-2012	Archival Data Analysis	How and when do firms report information about the GAAP ETR if the ratio has a condition that is appreciated by investors?	Firms with decreasing GAAP ETRs or GAAP ETRs close to their peers' tend to disclose more GAAP ETR information and provide this information more visibly in their annual financial and management reports.
Mills et al. (2013)	Corporate Income Tax	United States	Firms	1,970 firm-year observations	2000-2007	Archival Data Analysis	Do politically sensitive contractors pay higher taxes? Do firms with greater bargaining power incur fewer tax-related	Politically sensitive firms (federal contractors) report higher federal taxes. The relation between political sensitivity and tax costs decreases with a firm's bargaining power.

							political costs than firms with lower bargaining power?	
Northcut and Vines (1998)	Corporate Income Tax	United States	Firms	188	1981-1985	Archival Data Analysis	Does political scrutiny of corporate effective tax rates influence accounting policy choices?	Firms marked as 'corporate freeloaders' in public scrutiny by the Citizens for Tax Justice exhibit a positive association of average ETRs and changes in deferred tax expenses following the public pressure. Firms with low average ETRs use accounting choices and report higher average ETRs in the year prior to the upcoming tax reform (TRA 1986).
Watts and Zimmerman (1978)	Corporate Income Tax	United States	Firms	53	1972-1974	Theoretical Analysis Archival Data Analysis	Why are firms willing to spend resources to influence the determination of accounting standards?	Higher (reported) ETRs can be both a result of political costs and a tool to bias the political process. Firms having contact with governments affect their future cashflows by discouraging government action through the reporting of lower net incomes. Firm size is found to be the most important factor explaining managerial voting behavior on General Price Level Accounting.
Wong (1988)	Corporate Income Tax	New Zealand	Firms	95	1984	Archival Data Analysis	What are the effects of political and debt contracting costs on an intra-period accounting choice (accounting method choice for export tax credit)?	The choice of accounting method is linked to a firm's political costs. The results indicate that large firms adopt the 'credit to sales' method when accounting for export tax credits to raise their tax rates to the level of comparable politically less sensitive firms and to minimize public scrutiny.
Zimmerman (1983)	Corporate Income Tax	United States	Firms	43,515 firm-year observations	1947-1981	Archival Data Analysis	Are firm size, industry classification, and effective tax rates associated, and if so, how?	The study reveals that ETRs are partial measures of the firm's political costs. ETRs reflect managers' choice of (income reducing) accounting procedures and in turn the inherent political costs. This study provides evidence on the association between firm size and political costs (higher government scrutiny and wealth transfers). Consistent with the political cost hypothesis, the largest firms have the highest ETR in most but not all industries. The strongest association between firm size and ETRs is in the oil industry following the 1969 Tax Act.

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Kontaktadresse:
Prof. Dr. Caren Sureth-Sloane, Universität Paderborn,
Fakultät für Wirtschaftswissenschaften,
Warburger Str. 100, 33098 Paderborn,
www.arqus.info, Email: info@arqus.info

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