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**Firms' Tax Rate Misperception:
Measurement, Drivers, and Distortionary Effects**

arqus Discussion Paper No. 275
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Firms' Tax Rate Misperception: Measurement, Drivers, and Distortionary Effects*

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Abstract

Decisions-makers in firms are expected to use perceived rather than *actual tax rates* and hence their decisions can be substantially biased by misperception. We quantify firms' misperception of their average tax rate (ATR) and marginal tax rate (MTR) and identify drivers of this tax rate misperception. Using survey data on German firms, we find that the share of firms considerably misperceiving their ATR and MTR exceeds 65% and 57% respectively. Further, we illustrate firms' impaired comprehension of the tax schedule reflected by the relation between ATR and MTR. We find sole proprietorships and partnerships on average considerably overestimate their ATR anchoring at the top marginal tax rate. While corporations show no uniform tax misperception patterns for retained profits, they tend to strongly underestimate ATRs and MTRs on distributed profits. Irrespective of the legal form, we find misperception is mainly driven by tax regime complexity, lack of tax knowledge and dissatisfaction with the tax system. Surprisingly, even though many firms report using the ATR instead of the appropriate MTR in their investment and financing decisions, which suggests that they underestimate their tax burden, this bias is partially attenuated by their ATR misperception. Overall, our findings demonstrate that policymakers and researchers can benefit from incorporating firms' tax rate misperception when estimating firms' tax response and evaluating tax policies.

Keywords: Tax Misperception, Business Taxation, Survey, Tax Policy

JEL Codes: H25, H32, D91, M41

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1 Introduction

This study investigates the extent and drivers of firms' tax rate misperception. Identifying and quantifying misperception in firms is crucial for understanding how tax rate misperception affects firms' business decisions, e.g., investment decisions. Former studies on the effects of taxes on decision-making refer to *actual tax rates* (e.g., Dobbins and Jacob 2016; MacKie-Mason 1989; Graham 1996; Faccio and Xu 2015), and abstract from potential tax misperception in firms. This is surprising, as the literature on individuals demonstrates that, first, the perception of taxes influences behavior and, second, tax-related misperception is a common phenomenon (see Blaufus et al. 2022 for an overview). As decision-makers are expected to refer to perceived tax rates, which might considerably deviate from *actual tax rates*, misperception could significantly bias behavior. Moreover, if tax rate misperception shapes decisions in firms, for example when tax depreciation benefits that are supposed to stimulate the economy are underestimated, the effects of tax reforms may be very different or even contrary to what has been expected by policymakers. Gallemore et al. (2021), for instance, show that firm-specific tax policy expectations shape corporate investments rather than actual implementation of tax reforms. For firms, tax rate misperception is likely to induce several kinds of biased decisions such as investment, financing or location decisions. Against this background, it is important to understand in what direction and to what extent firms misperceive tax rates and which tax rate they use in decision-making.

We define tax rate misperception as the deviation of *reported tax rates* from *actual tax rates* relying on our survey evidence. This approach enables us to measure the extent of tax rate misperception and examine the heterogeneity of misperception with respect to the share of misperceiving firms, and the share of over- and underestimating firms. Also, and to alleviate undesired misperception, understanding the drivers of and which types of firms are particularly exposed to tax rate misperception is crucial. Further, we investigate the relationship between estimated ATRs and MTRs in general and depending on the characteristics of the underlying firms (such as legal form and size). At the same time, we analyze whether firms incorporate their ATR or MTR in their decision-making process, as tax rates are among the fundamental parameters to be considered in almost every business decision (Graham 2003). Finally, we analyze the interplay of tax rate misperception and tax rate choice in firms' decision-making.

To understand the heterogeneity in firms' misperception we use a large sample that covers firms of different size and legal form and includes small or medium sized firms (SMEs). In a first step, we collect data on firms' reported ATRs and MTRs by using a web-based survey on German firms. In a second step, we determine the *actual tax rates* of the surveyed firms as a reference point. Ideally, *actual tax rates* would

be obtained from tax return data; Gideon (2014, p. 1) calls this approach the ‘gold standard measure’. Unfortunately, tax return data is not available due to data protection restrictions and we refrained from asking the responding managers and owners for the necessary tax information of their firm since answers could be noisy as self-reported profits might be erroneous and tax-relevant information is often unknown to them. Further, respondents might be reluctant to reveal this private information which then would result in non-response. We use an indirect approach to avoid these problems. We ask our respondents to estimate their firm’s ATR and MTR for a *given profit* which mimics their firm’s profit. We estimate a firm’s profit based on firm characteristics provided in the survey and calculate the corresponding tax burden, which allows us to determine *actual tax rates* by applying the tax schedule to the *given profit*. In case of sole proprietorships and partnerships, we additionally employ personal characteristics to account for *Additional Income* and *Special Expenses* that affect them firms’ progressive income tax rate.

Our results show that firms considerably misperceive their tax rates. If we regard *reported tax rates* accurate that do not deviate more than within ± 5 percentage points (pp) from the *actual tax rate* (“no misperception”), we still find that more than 65% (57%) of our firms misperceive their ATR (MTR). In general, sole proprietorships and partnerships estimate their MTRs more accurately than their ATRs and show a rather uniform pattern of misperception: ATRs are considerably overestimated, while MTRs are underestimated on average. Consistent with our expectations based on the rather simple flat tax on corporate profits, corporations are better at estimating their tax rates on retained earnings. Here, only slightly more than 40% of the corporations misperceive their ATR and MTR by more than ± 5 pp. The share of ATR and MTR over- and underestimating corporations is about equal. However, a very different picture emerges when analyzing the tax rates on distributed profits where shareholder taxation comes into play: Corporations tend to severely underestimate tax rates and the share of ATR and MTR misperception rises to over 60%, presumably due to higher tax complexity introduced by the additional shareholder taxation. Another surprising finding is that about 25% (37%) of corporations do not know their ATR on retained profits (distributed profits) is equal to their MTR, despite the existence of a flat tax for corporations. To examine the influence of firm and personal characteristics, we conduct regression analyses. We find that in addition to tax system differences due to legal form specific tax regimes, responding managers’ personal characteristics play an important role. Both tax knowledge and the satisfaction with the current tax system in Germany are negatively associated with ATR and MTR misperception. In line with previous literature, we demonstrate that firms most frequently use the ATR instead of the appropriate MTR in their business decisions. However, in case of sole proprietorships and partnerships this inappropriate tax rate choice is often attenuated by tax rate misperception. Since firms tend to overestimate their (erroneously applied) ATRs, in around 40% of the cases, their estimated ATR

is rather close to their actual MTR (deviations less than ± 5 pp). Hence, due to their ATR misperception they unintendedly apply the correct tax rate in decision-making. Together with the firms that apply their correctly estimated MTR, 51.5% of these firms use appropriate tax rates in their decisions.

Despite the importance and magnitude of tax rate misperception, other findings on entrepreneurial and corporate tax misperception are scarce to date. Literature focuses mostly on individuals and finds a large extent of tax rate misperception. Schmölders (1960) pioneered this field and reports that about 50% of surveyed German individuals overestimate, 20% underestimate and roughly one third correctly estimates their average tax burden. Enrick (1963) notes that US taxpayers tend to underestimate their average tax burden. Van Wagstaff (1965) confirms these results in a survey on US employees and finds that about 10% hold accurate beliefs about their average tax burden. However, over- and underestimates are almost balanced. Auld (1979) surveys Canadian individuals and finds that low- and high-income respondents significantly overestimate their average tax burden, while members of the middle-income group estimate their ATR almost exactly. Gideon (2014), Gideon (2017), Ballard and Gupta (2018) observe in surveys that US individuals, on average, overestimate their ATR. Furthermore, Stantcheva (2021) finds that US individuals tend to misunderstand the progressivity level of the US tax system, i.e. perceive less progressivity than codified. Studies on individuals' ATR estimates for different income categories predominantly show a tendency towards overestimation of ATRs for low incomes and the contrary for higher incomes (Blaufus et al. 2015; Rees-Jones and Taubinsky 2019). By contrast, Williamson (1976) finds respondents overestimating ATRs along all income categories. Relatedly, there are studies on individuals' beliefs about MTRs. Gensemer et al. (1965) find in their survey on US high income earners that roughly 30% of the respondents are not aware of their MTR. A survey on Scottish managers and workers by Brown (1969) highlights that 80% of managers and workers do not accurately estimate their MTR, predominantly overestimating it. Rupert and Fischer (1995) find consistent evidence with less than 10% of their respondents estimating their MTR accurately. According to Fujii and Hawley (1988), only one third of their US respondents' estimates on MTRs are accurate. Also, Gideon (2017) provides evidence for US individuals with higher income underestimating their MTR. Blaufus et al. (2015) find that German individuals overestimate (underestimate) MTRs for given low (high) incomes. Further, they find that ATRs are often mistaken for MTRs. Consistently, Bartolome (1995) finds respondents to confuse ATRs and MTRs. All these studies focus on individuals in a non-business context only.

Even though decisions in firms are ultimately made by individuals, misperception in firms could be different from individuals for three reasons. First, managers in firms are exposed to and influenced by incentive structures (Armstrong et al. 2012) which often are affected by taxes and therefore, to look precisely into taxes can be more important for a manager. Second, most firms should employ internal (tax department

or tax-educated staff) and/or external tax knowledge (tax consultants) which, in turn, is likely to affect management decisions (DellaVigna 2009; Feller and Schanz 2017). Third, firms are subject to a firm-specific tax environment (tax code and tax framework) and are usually subject to more than one tax, which results in higher complexity of entrepreneurial taxation (see e.g., McKerchar et al. 2005). Having this in mind, a closer look on firms is necessary to understand the extent and drivers of firms' tax rate misperception.

Schmölders (1960) is the first to examine tax burden (mis)perception of entrepreneurs. His evidence indicates that the majority of surveyed farmers and self-employed individuals overestimate their ATR. Although they have to pay income tax like employees, they are subject to a more pronounced misperception. Contrary, Blaufus et al. (2015) finds that self-employed and employed individuals are very similar in their tax (mis)perception. Unlike Schmölders (1960) and Blaufus et al. (2015), other studies on entrepreneurs' ATR (mis)perception, do not analyze self-employed and employed individuals separately. To the best of our knowledge, Hundsdoerfer and Sichtmann (2009) is the only study on entrepreneurial MTR (mis)perception. They investigate self-employed German physicians' perceptions of their MTR. About 25% of the respondents report MTRs that do not exist according to German tax law. For the remaining respondents over- or underestimations cannot be quantified since the authors do not determine actual MTRs to benchmark reported MTRs. Graham et al. (2017) provide survey evidence that tax executives in large firms often use the ATR or the statutory tax rate instead of the MTR in their decision-making process. Their results indicate that tax misperception occurs even in large firms with own tax departments. However, beyond this finding, Graham et al. (2017) do not analyze whether tax rates are correctly perceived.

We are the first to quantify firms' tax rate misperception, to identify drivers of tax rate misperception and to enhance findings on managers' tax rate choice for investment decisions by linking it to tax rate misperception. We employ an innovative survey-based measuring approach and exploit a sample of firms of different size, legal form and industry with a large share of SMEs. Therefore, this sample offers the rare opportunity to investigate these firms, that contribute a major share to the OECD economies but are widely underresearched. Additionally, we can fill the research gap between the numerous analyses of individuals' tax rate misperception and Graham et al. (2017) analysis of large corporation managers' tax rate misperception by examining mostly SMEs and private firms. By identifying and quantifying firms' tax rate misperception, we provide important insights that might enhance future studies on real effects of taxation. Quantifying tax rate misperception helps to predict firms' behavior in response to taxes and tax reforms more accurately. Further, quantifying the degree of misperception for different kinds of firms can help to develop proxies for tax rate misperception to be included in future empirical research on the evaluation of policy measures.

2 Survey Design & Sample

2.1 Survey Design

Our results are based on data collected from German firms via an online-questionnaire. The questionnaire incorporates different approaches to identify misperception and allows us to compare our results to the literature (e.g., Schmolders 1960; Hundsdorfer and Sichtmann 2009; Blaufus et al. 2015; Graham et al. 2017). We conducted the survey using the online application LimeSurvey¹ in the period between Jan 11, 2021 and April 22, 2021. To obtain a rich sample, we approached firms with the help of various multipliers such as chambers of handicraft, manufacturing and trade or financial institutions as well as consulting firms.² We approached firms³ either directly by e-mail or via our multipliers, which sent out e-mails, or employed their newsletter or website to contact the firms. We sent out a reminder where possible. As we distributed our questionnaire partially via multipliers, we are not able to determine an overall response rate.

As part of the process of developing the questionnaire, we gathered feedback upfront from several of our multipliers. In addition, we conducted pre-tests with selected multipliers, tax practitioners and students with prior knowledge in the field of business taxation. We use filter questions at various points to ensure that in particular small and craft firms only receive those questions that are relevant for them. The same holds for questions specific to the legal form. The final questionnaire consists of seven sections.⁴ (1) We ask for firm characteristics such as legal form, number of employees, turnover, etc. (2) For the “tax burden block”, we present a figure that illustrates the legal form-specific taxation of firms. Here, for sole proprietorships and partnerships, we illustrate the taxation with trade tax and transparent income tax, and for incorporated firms, the two-level taxation with corporate and trade tax at the corporate level and income tax at the shareholder level. Against this background, we ask the respondents to estimate their firm’s ATR and MTR for a profit which we customized for each respondent based on relevant information about the respective firm. We asked respondents from corporations to estimate the ATR and MTR in two different settings, full retention of profits and full distribution to domestic shareholders (natural person). For sole proprietors and partnerships such a differentiation is dispensable as their taxation does not depend on their distribution strategy.⁵ (3) We asked for firms’ tax rate relative to peers. (4) We asked the firms about whether and how they consider taxes and specific tax rates in their business decisions. (5) We asked respondents about the relative share of

¹ For more information, see <https://www.limesurvey.org/de> (08-19-2022).

² A list of participating institutions can be found in our Executive Summary, see Fochmann et al. (2021).

³ We are aware of the fact that individuals respond to the survey on behalf of the firm. But for convenience and better readability, we refer to the firm as survey respondent if not otherwise stated.

⁴ Depending on firm characteristics and response behavior, the number of questions to be answered may vary. See Appendix A1 for details about the survey.

⁵ Sec. 34a German Income Tax Code constitutes an exemption of this rule. However, due to its complexity this tax option is almost never exercised.

tax compliance costs in their firm’s total compliance costs. (6) The respondents had to answer questions about the complexity of the tax system, the provision of tax-relevant information by tax authorities and trust in the expenditure policy of the government. (7) We asked them about whether their firm is, has been or is expected to be in a profit or loss situation and some personal characteristics of the respondent.⁶

Our research design involves some limitations: It cannot be ruled out that the results are influenced by a self-selection bias and that respondents answered not all questions seriously. As the median (mean) response time of around 14.2 (18.4) minutes is close to our estimate of 15 minutes, this suggests that the questionnaire was taken seriously. Also, since the survey grants full anonymity, we expect honest answers. As we used neutral language framing effects were limited to a minimum. We supplemented terms that might have been unclear with explanations or visualizations to avoid deviating interpretations by respondents. All this and a battery of robustness tests makes us confident that our data is of high quality.

2.2 Sample

The total sample comprises 1,806 observations, of which 657 are complete.⁷ We exclude 138 firms with characteristics that make them subject to a special tax treatment that is beyond the scope of our survey. We exclude for several reasons: (1) Firms are member of a group or fiscal unity, (2) Partnerships apply for a tax option according to Section 34a German Income Tax Code, (3) Firms state to be partly exempted from trade tax, (4) Firms with very low profits under €20,000⁸, (5) Firms do state their ATR but not their MTR within the survey, or (6) firms cannot be matched within our propensity score matching (see Section 3.2.1).

This leaves us with a final sample of 519 German firms. 52% of these firms are sole proprietorships, 22.5% are partnerships (including mixed forms⁹) and 25.4% are corporations. More than 94.8% of the surveyed firms can be defined as SMEs (less than or equal to 250 employees and sales of less than or equal to €40,000,000).¹⁰ Firms from the craft sector are particularly well represented (84% of our sample). The high weight of SMEs reflects the firm landscape of Germany and other big economies around the world: Examining for example the United States, Canada, United Kingdom and Germany shows that SMEs are by far the biggest group of businesses (OECD 2022). Further, SMEs are responsible for more than 50% of the gross domestic product in most OECD countries (International Labour Organization 2019). While SMEs and

⁶ There are several reasons why we split the demographics into two parts, one in the beginning, one in the end: First, we need some firm characteristics for the determination of a firm’s profit. Therefore, we ask for these characteristics upfront. Second, there are easy to answer questions, which allow for a convenient start in the questionnaire (Porst 2014). But to not bore respondents with demographics, we ask for the second part in the end our survey. Furthermore, some easy to answer demographic questions are placed at the end to account for our relatively long survey (Häder 2015).

⁷ For insights into the results of all observations, see our Executive Summary in Fochmann et al. (2021).

⁸ We exclude firms with extremely low profits since we assume that this is only auxiliary income and therefore their actual income is not reliably predictable.

⁹ Mixed forms are a special legal form that combine characteristics of partnerships and corporations such as GmbH & Co. KG.

¹⁰ This is in accordance with Section 267 of the German Commercial Code (HGB).

especially craft enterprises are an important factor to countries' economy, but hardly covered in previous literature, our sample allows us to study this highly relevant sector.

In Table 1 we compare our sample with the official German Business Register 2020 (German Federal Statistical Office 2020).

< insert Table 1 about here >

Over 85.3% of our firms report a profit in 2020. Around 89.4% of the firms make use of the services of an external tax consultancy and 4.4% have their own tax department. Of our respondents, 78.8% are male, 19.1% female and 0.2% diverse; 97.2% hold an executive position, 77.1% claim to have tax knowledge. 51.5% of them acquired their tax knowledge through training or studies and 48.5% qualify as self-taught. In Table 2 we provide a summary statistics of our sample.

< insert Table 2 about here >

3 Measuring Tax Rate Misperception

We quantify firms' ATR and MTR misperception by contrasting the *reported tax rate* extracted from our survey with the *actual tax rate* determined by us. The difference between these two tax rates denotes the extent of firms' ATR/MTR misperception:

$$ATR \text{ Misperception} = \text{Reported ATR} - \text{Actual ATR} \quad (1)$$

$$MTR \text{ Misperception} = \text{Reported MTR} - \text{Actual MTR} \quad (2)$$

Even though we rely on German tax rules (given our sample consists of German firms), we are confident that our results are applicable for other countries since Germany's tax law is based on the internationally widely used dual system of business taxation shown in Figure 1 (Endres and Spengel 2015). Sole proprietorships and partnerships (defined as non-legal entity in Germany) are subject to the so-called pass-through principle, where as corporations are subject to the separate entity principle.

< insert Figure 1 about here >

3.1 Reported Tax Rate

The variable *reported tax rate* describes each firm's answer when asked about its ATR and MTR. Since data on firms' profit is highly sensitive, in close consultation with our multipliers, we refrained from asking about

their profit directly to avoid high dropout rates. Instead we asked for firm characteristics that enable us to be able to determine a profit that mimics the actual profit of each firm in the survey. Accordingly, firms are asked to estimate their ATR for this *given profit*. Our calculation of the *given profit* is based on aggregated annual financial statement data from the *Deutsche Bundesbank*¹¹, which contains average profits per employee at industry-level for different firm sizes and legal forms. The *given profits* in the survey correspond to the median profits of firms in the same industry, with the same legal form and the same number of employees. To determine the MTR, firms are asked to estimate the tax rate on a 10% increase of the *given profit*.¹² Beyond avoiding overly high dropout rates, using median profits of comparable firms helps us to rule out effects of highly volatile firm profits. We assume less misperception when it comes to estimating the tax burden of a *normal* profit rather than the specific profit of a given year, which may differ considerably from the average performance. Relatedly, we use the latest available Deutsche Bundesbank data from 2018 and we refrained from extrapolating it to avoid inferences from the Corona Crisis.

3.2 Actual Tax Rate

Determining the *actual tax rate* as a benchmark is challenging as most data bases do not cover large parts of our sample firms. The most favorable option would be to apply the ‘gold standard approach’ (Gideon 2014, 1) and to compare *reported tax rates* with tax rates derived from tax return data. However, German tax return data of firms (as well as of individuals) is not accessible at the micro level due to data protection regulations. Given the structure of our sample (predominantly SMEs, many sole proprietorships and partnerships), we also cannot employ tax information provided in financial statements because the respective data is missing due to limited disclosure obligations of these firms. But we cannot exploit financial statement tax information of (larger) corporations either, since most of them did not agree on matching their financial statement and survey data.

Hence, we have to determine firms’ tax rates based on an own approach which is explained in the next two sections of this paper. Because of the differences in tax regulations applicable to sole proprietors and partnerships on the one and corporations on the other side we develop two separate approaches to determine *actual tax rates*.

¹¹ We would like to thank the Research Data and Service Center, in particular Prof. Dr. Stefan Bender, for providing the data.

¹² In addition to indicating the 10%, we also specify the increase in €(10% of the *given profit*) to avoid any confusion with the percentage figure only.

3.2.1 Sole Proprietorships and Partnerships

Determining *actual tax rates* of sole proprietorships and partnerships is not straightforward due to legal form-specific tax rules in Germany. As mentioned, sole proprietorships and partnerships are subject to the so-called pass-through principle, i.e. firms' profits are attributed to firm owners and taxed according to their individual income tax rate. Firm owners' profits are included as business income (Section 15 German Income Tax Code) in their taxable income which is subject to a progressive income tax schedule¹³ (incl. solidarity surcharge¹⁴). Since the taxable income does not only include business income but also other categories of (additional) income (e.g., income from employment or rental income) and *Special Expenses* (e.g., social security contributions) can be deducted, we must take these tax base effects into account when calculating actual income tax rate.

To account for these tax base effects, it is necessary to incorporate *Additional Income* and *Special Expenses* when determining the actual ATR and MTR.¹⁵

$$\text{Taxable Income}_i = \text{Profit}_i + \text{Additional Income}_i - \text{Special Expenses}_i \quad (3)$$

Here, Profit_i is the *given profit* in the survey. For partnerships, we divide the partnership's profit by the number of partners due to lack of information on a partnership's profit distribution agreement. We did not ask for *Additional Income* and *Special Expense* within the survey due to its sensitive nature. Further, the responding person is often an employed manager who does not have these private data of firm owners. But even, responding firm owners might have difficulties estimating their tax related *Additional Income* and *Special Expenses* accurately. Thus, we use the "Factually Anonymized Data from Income Tax Statistics" (FAST 2014) offered by the German Federal Statistical Office to impute *Additional Income* and *Special Expenses* into our survey data. FAST 2014 is a 10% stratified sample of the Official Income Tax Statistics of 2014 which contains extensive tax information on German taxpayers (e.g., sources of income, *Special Expenses*, tax liability). However, data protection regulations prevent us from matching single taxpayers to the corresponding firm owners of our sample firms. Therefore, we match each of our firms with a predefined number of FAST 2014

¹³ The income tax follows a progressive tax schedule with marginal tax rates from 0% to 45% acc. to Section 32a German Income Tax Code.

¹⁴ The solidarity surcharge is added on the income tax and amounts to 5.5% acc. to Section 4 Solidarity Surcharge Code. In 2021 the law changed and the solidarity surcharge omits for roughly 90% of the taxpayers, see <https://www.bundesfinanzministerium.de/Content/DE/FAQ/2019-08-21-faq-solidaritaetszuschlag.html> (08-19-2022). Since we asked for profits in 2020 and this novel ruling might not be known by our respondents, we include it in our calculation to avoid creating artificial tax rate overestimation.

¹⁵ Even though we provide a lot of guidance to the firms to make sure that they focus on business income, we have no guarantee that they do not incorporate *Additional Income* and *Special Expenses* when estimating their tax rate. To show the robustness of our results, we conduct a robustness check by running our analysis based on profits only; see Appendix A5.2.

observations that are as similar as possible based on the following characteristics: profit, industry, and legal form. We impute the median value of *Additional Income* and *Special Expenses* of the respective FAST 2014 observations into our data. Figure 2 illustrates how we derive the *Taxable Income* based on a *Profit* reported for a sole proprietorship or partnership.

< insert Figure 2 about here >

To match survey and FAST 2014 observations we use a Propensity Score Matching approach.¹⁶ Our propensity scores (Rosenbaum and Rubin 1983) are based on the following simple logistic regression equation:

$$Survey_i = \alpha_i + \beta_i \cdot X_i + \epsilon_i \quad (4)$$

where $Survey_i$ is 1 if it is a survey observation and 0 otherwise and X_i is the set of our of matching variables. X_i includes $Profit_i$, $Industry_i$, and $Legal Form_i$. $Profit_i$ is the natural logarithm of firms' profit,¹⁷ $Industry_i$ describes in which industry the firm operates in, $Legal Form_i$ describes if a firm is a sole proprietorship or a partnership. To determine tax rates, it is also relevant whether a firm owner files his or her tax return alone or jointly with a spouse (income tax splitting). Since we could not ask for the marital status of firm owners due to data protection regulation, we match our survey observation twice - once with single FAST 2014 taxpayers and once with FAST 2014 joint taxpayers. For this purpose, we include a variable $Marital Status_i$ which is 0 in case of a single and 1 in case of a married person. We use nearest neighbor matching within a 0.1 caliper radius without replacement.¹⁸ Since we rely on a 1:10 propensity score matching, we find the ten closest comparable taxpayers within the FAST 2014 data based on the propensity score. A successful propensity score matching relies on the assumption that the remaining variables have no influence on the depending variable (Bilicka 2019; Shipman et al. 2017; Stuart 2010). Although, we cannot empirically test this assumption due to (survey) data limitations, we follow Shipman et al. (2017) and carefully select the most influential variables on tax rates of sole proprietors and partners based on theoretical considerations. We account for those characteristics (*Profit*, *Industry*, *Legal Form*, and *Marital Status*) that affect the *actual*

¹⁶ See Appendix A3 for results of the Propensity Score Matching.

¹⁷ Since FAST 2014 includes nominal 2014 values, but the *given profit* in the survey is based on 2018 values, we deflate the *given profit* by GDP growth in Germany between 2014 and 2018 to obtain comparable values.

¹⁸ See Cochran and Rubin (1973) and Rosenbaum and Rubin (1985) for the determination of the optimal caliper. We define the caliper with 0.1 as small as possible to get a precise matching but large enough that we can get the 10 matches in the vast majority of cases. Nevertheless, we run robustness checks with a caliper of 0.2 on a 1:10 matching and a caliper of 0.2 on a 1:20 matching. The results are robust; there are only marginal differences in the amount of misestimating firms ($\leq \pm 0.5pp$)

tax rate of a non-corporation.¹⁹

Table 3 provides an overview of the effect of our imputation on the *Taxable Income*. The difference between *Taxable Income* (3) and a firm’s *Profit* (1) depends on the marital status and the legal form. For our following analyses we rely on the taxable income to determine the *actual tax rate*.

< insert Table 3 about here >

In the Appendix A5.2, we show robustness of our results for using profits or total income to compute the *actual tax rate*.

After determining a firm’s *Taxable Income*²⁰, we rely on the German Income Tax Schedule to determine the *actual tax rate*.

In addition to the personal income tax (PIT), profits of (commercial) sole proprietorships and partnerships are subject to trade tax (TT), which is determined based on the firm’s profit. Determining the actual trade tax rate is straightforward by multiplying the trade tax multiplier reported by the firm by the base trade tax of 3.5%.²¹ However, the TT is entirely or at least largely compensated by an income tax credit (Section 35 German Income Tax Code) for which we also account for.

The following equations sum up our approach to determine the actual ATR and MTR:²²

$$Actual\ ATR_i = PIT(Taxable\ Income_i) + TT_i(Profit_i) - Income\ Tax\ Credit(TT_i) \quad (5)$$

$$Actual\ MTR_i = PIT(\Delta\ Profit_i) + TT_i(\Delta\ Profit_i) - Income\ Tax\ Credit(\Delta\ TT_i) \quad (6)$$

Due to the entire or vast neutralization of the TT by the income tax credit both ATRs and MTRs of sole proprietorships and partnerships are almost entirely determined by the progressive income tax rate.

To account for effects emerging from differences in the marital status of firm owners we use a conservative approach. We compare the deviation of the *reported tax rate* from the *actual tax rate* for each marital status

¹⁹ In Germany firms can use a tax loss carrybackward or carryforward, which can influence the tax rate as well. Within our survey we cannot define if and to what extent survey respondents included it in their reported ATR. To rule out that we miss a potentially relevant factor, we compare reported ATRs of firms that reported a loss for 2019 or 2020 with comparable firms that had profits in 2019 and 2020. The results show no significant difference in their reported ATR, which is why we are confident neglecting losses does not affect our results.

²⁰ For high incomes exceeding €972,411, our matching process is not applicable since FAST 2014 does not include such high income earners due to data protection regulations. Nevertheless, we keep these observations in our sample, but do not add *Additional Income* and *Special Expenses*. Since such profits already exceed the threshold at which tax progression has a noticeable effect on ATRs (and no effect on MTR), this approach does not bias our results.

²¹ In Germany, the local trade tax multiplier is set by each municipality separately, which is why we ask firms for this variable. If there is no or no plausible entry on the trade tax multiplier we use 400%. This figure represents the weighted average of the trade tax multiplier in Germany - as used by the OECD Tax Statistics, OECD (2022).

²² For the actual MTR, we use the profit and increase it by 10%. This way we ensure that there is just an increase in profit, but no change in *Additional Income* and *Special Expenses*, which are unrelated to an increase in business income.

and then use the smaller deviation as our measure for tax misperception. With this approach we avoid identifying misperception that is solely based on a false categorization of a firm owner as a single/married person.

3.2.2 Corporations

Determining the *actual tax rate* of corporations is straightforward. We use the respective (flat) tax rates for corporate and shareholder taxation.²³ As shown above, corporations are taxed according to the separate entity principle: Profits are subject to corporate income tax (CIT incl. solidarity surcharge = 15.825%) and TT (depending on the trade tax multiplier of a municipality) at the firm level irrespective whether profits are retained or distributed.

In case of retained profits, we determine the *actual tax rate* as follows:

$$\text{Actual ATR/MTR}_{\text{retained},i} = CIT + TT_i \quad (7)$$

If profits are distributed to natural persons as shareholders, they are subject to the income tax of the shareholder which is generally the final withholding tax (WHT incl. solidarity surcharge = 26.375%).

In case of distributed profits, we obtain the *actual tax rate* as follows:

$$\text{Actual ATR/MTR}_{\text{distributed},i} = CIT + TT_i + [1 - (CIT + TT_i)] \cdot WHT \quad (8)$$

As corporations' retained and distributed profits are subject to a flat tax rate, the actual MTR does not deviate from the corresponding ATR. Thus, in contrast to sole proprietors and partnerships, the actual ATR and MTR are identical.

²³ In some cases, dividends are subject to the regular progressive income tax schedule, but 40% of dividends are tax exempt in order to avoid excessive taxation of corporate profits. In these cases, too, the income tax rate is generally very close to the final withholding tax.

4 Results

4.1 Extent of Tax Rate Misperception

To answer ‘Whether and to what extent do firms have tax rate misperception?’, we provide descriptive evidence to what extent firms misperceive their ATR and MTR. First, we quantify misperception metrically. Besides analyzing overall misperception, we also examine over- and underestimation of ATR and MTR separately. Second, we identify the share of misperceiving firms by using our metric measure of misperception. As we are interested in the share of misperceiving firms, we have to define when a *reported tax rate* is considered to be accurate or misperceived. We choose a conservative approach and accept deviations of the *reported tax rates* within a narrower corridor of ± 5 pp or a broader corridor of ± 10 pp from the actual ATR and MTR as accurate.²⁴ We display the sensitivity of misperception with respect to a corridor width from nearly 0pp to 50pp in Figure 9 in Appendix A4.1.

In Table 4, we show mean values of reported and actual ATRs and MTRs. The firm-specific benchmark tax rates are determined based on taxable income as described in Section 3.2.

< insert Table 4 about here >

On average, sole proprietorships and partnerships significantly overestimate their ATR. Contrary, they tend to underestimate their MTR. Corporations, on average, only slightly overestimate their ATR on retained profits. Misperception rises considerably and turns into underestimation if corporations are asked about their perception of the ATR in case profits are fully distributed. Likewise, they overestimate their MTR at the firm level and underestimate it when including shareholder taxation. For ATRs and MTRs, the share of corporations misperceiving them is comparable although the level of misperception is considerably higher for distributed profits. To identify potential patterns of misperception induced by the legal form, in the subsequent sections we examine misperception of non-corporations and corporations separately.

4.1.1 Sole Proprietorships and Partnerships

We display reported ATRs of sole proprietorships and partnerships in Figure 3. The two dot-dashed lines show the actual ATRs determined on profits for married (lower line) and single (upper line) firm owners to illustrate the ATR trend.

< insert Figure 3 about here >

Although reported ATRs somewhat reflect the progressive slope of the German income tax schedule, we

²⁴ Blaufus et al. (2015) also apply a corridor of ± 5 pp to classify *reported tax rates* as misperceived.

find many overestimates, especially in the direct progressive zone of the tax schedule (taxable income below around €57,000). Within the ‘deviation-corridor’ of ± 5 pp (± 10 pp) from the actual ATR 71.1% (56.3%) of sole proprietors misperceive their ATR, with 95.3% (97.4%) of them overestimating it. In case of partnerships 73.5% (58.1%) of the firms misperceive their ATR, with 77.9% (76.5%) of them overestimating it.

< insert Figure 4 about here >

Reported MTRs of sole proprietors and partnerships are displayed in Figure 4. When allowing for a deviation of ± 5 pp (± 10 pp) from the actual MTR, 57.8% (39.6%) of sole proprietors and 57.3% (37.6%) of partnerships misperceive their MTR. Underestimation is the prevalent pattern for sole proprietors (59% (64.5%)) as well as for partnerships (62.7% (75%)). Interestingly, sole proprietors and partnerships seem to be less exposed to misperception of MTRs than to misperception of ATRs. To examine that the effects of tax rate misperception on business decisions, we conduct additional tests in Section 4.3.

Our results document an overall pronounced tax rate misperception. To draw conclusions on firms’ ability to understand the concept of ATR and MTR resulting from the progressive income tax schedule, we compare reported ATRs and MTRs. In a direct progressive tax system such as the German income tax, except for the range of the personal allowance, MTRs always exceed the corresponding ATRs. Thus, for sole proprietors and partnerships, we expect firms to consistently report $MTR > ATR$. In Figure 5, we plot average reported ATRs and MTRs of sole proprietorships and partnerships on *given profits*.

< insert Figure 5 about here >

Interestingly, examining sole proprietors’ and partnerships’ average reported ATRs and MTRs across the income range reveals a trend different from our expectations: On average, reported MTRs are not or only hardly distinguishable from reported ATRs²⁵, even though sole proprietors report significant smaller MTRs than ATRs for profits ranging between €50,000 and €125,000. This is a remarkable misperception of the relation between ATR and MTR and indicates that our firms do not understand the German progressive income tax schedule. Further, we disclose an interesting pattern of misperception: More than half of all sole proprietors and partnerships that misperceive their ATR also misperceive their MTR²⁶.

We find merely less than 50% of report MTRs exceed corresponding ATRs. About 20% even report ATRs larger than MTRs. These firms seem to have difficulties in understanding the concept of MTR. Half of them provide single digit MTRs although they report double digit ATRs.²⁷ One third of sole proprietors

²⁵ Paired t-test with $p > 0.10$.

²⁶ Based on a deviation of ± 5 pp from the actual ATR/MTR.

²⁷ It may be that these firms did not understand the question about the marginal tax rate. We perform additional analyses for subsamples excluding these firms, see Appendix A5.1.

and partnerships simplifies their estimation by using the same tax rate for ATR and MTR. This could be regarded as a support of Rees-Jones and Taubinsky (2019) who show that individuals tend to linearize the tax schedule based on their ATR (*ironing heuristic*). However, we are skeptical whether these firms really base their tax rate estimates on their ATR for two reasons: First, these firms are much better in estimating their MTR than their ATR.²⁸ Second, more than 15% of these firms report an ATR of 42% resp. 45% which are the two MTRs explicitly listed in Section 32a of the German Income Tax Code and often mentioned in political debates.²⁹ Hence, we argue that at least this fraction of sole proprietors and partnerships anchor their ATR estimates on the more salient MTRs.

4.1.2 Corporations

The taxation of profits at the corporate level is independent of the personal circumstances of the shareholders, in accordance with the *separation principle*. The reported ATR in Figure 6 is divided into (1) retained profits of the corporation and (2) distributed profits including taxation at the shareholder level. The dot-dashed line indicates the nominal tax rate of 29.825% as a reference line for the *actual tax rate* on retained profits.³⁰ In case of distributed profits, the reference line also includes dividend taxation with the final withholding tax of 26.375% (25% + 5.5% of it solidarity surcharge) (Section 32d (1) German Income Tax Code).

For retained profits, many firms report a tax rate close to the reference line. Nevertheless, there is considerable variation especially within the lower profit area. When allowing for a deviation of $\pm 5\text{pp}$ ($\pm 10\text{pp}$) from the actual ATR, 43.2% (22%) of corporations misperceive their ATR on retained profits, with 64.9% (62.1%) of them overestimating it. These values are surprisingly high given the flat and easy to determine tax rate on retained profits. The share of misperception substantially increases for distributed profits as in Figure 6 depicts. 65.2% (43.9%) of corporations misperceive their ATR on distributed profits given a corridor of accepted deviation of $\pm 5\text{pp}$ ($\pm 10\text{pp}$) from the actual ATR, with only 30.2% (25.9%) of them still overestimating the tax burden.

< insert Figure 6 about here >

Comparing the reported ATRs on retained and distributed profits allows us to deduce the misperception of dividend taxes. In contrast to the findings on retained profits, taxation of dividends, is also on average, significantly misperceived. This is surprising as dividends are regularly taxed at a flat tax rate of 26.375%

²⁸ The average ATR Misperception is 9.6% and the average MTR Misperception is -2.9%.

²⁹ In this regard, Bartolome (1995) demonstrate that tax rates that are more salient in a tax table presented to respondents are used more often in economic decisions.

³⁰ Despite the flat tax rate, the *actual tax rate* can vary between corporation due to different local trade tax multiplier. To simplify the figure, we use the mean value of 400% which results in a tax rate of 29.825% ($= 15\% * (1 + 5.5\%) + 400\% * 3.5\%$).

(25% final withholding tax plus solidarity surcharge) whereas our corporations indicate an average dividend tax rate of 16.958%. Evidently, corporations are relatively accurate at estimating their ATR at the corporate level, but have considerably less understanding of the ATR on distributed profits.

We provide reported MTRs of corporations for retained and distributed profits in Figure 7. There, the reference line shows the actual MTR for full profit retention and distribution, resp., both for a trade tax multiplier of 400% and equals the reference lines. If misperception is defined as a deviation of more than ± 5 pp (± 10 pp) from the actual MTR, 46.2% (29.5%) of corporations misperceive their MTR on retained profits, with 67.2% (61.5%) overestimating it. For distributed profits, 64.4% (49.2%) of the corporations misperceive their MTR if misperception is defined as a deviation of more than ± 5 pp (± 10 pp) from the actual MTR. The share of overestimating firms amounts here only to 30.6% (29.2%). Given the tolerance range of ± 5 pp, 94.7% (96.5%) of ATR misperceiving corporations also inaccurately report their MTR for retained (distributed) profits.

< insert Figure 7 about here >

In comparison to the findings on ATR misperception, corporations are less accurate in estimating their MTR, especially for retained profits, as the variation in MTRs is significantly higher than in ATRs. This result is interesting as retained profits are used for investment and MTRs should be used for the resp. decisions. So, in Section 4.3 we investigate the role of misperception for business decisions.

< insert Figure 8 about here >

Our results document that corporations, on average and in line with our expectations, report very similar ATRs and MTRs. An illustration of the relation of ATR and MTR for corporations is provided in Figure 8. Nevertheless, we still find that 25% (37.1% report MTRs different to ATRs in case of retained (distributed) profits. Although distributing profits does not change the proportionality of the tax schedule, more corporations are unable to estimate the relation between ATR and MTR correctly.

4.2 Drivers of Tax Rate Misperception

After showing that firms often misperceive their ATR and MTR, we analyze which drivers affect firms' tax rate misperception. The independent variables to be included in our model are based on the extensive research on individuals' tax misperception (see Blaufus et al. 2022) and on special characteristics of our firms. We analyze the potential drivers using our survey data and conducting a regression analysis of the following simplified form:

$$Misperception_i = \alpha + \beta \cdot Drivers_i + \epsilon_i \quad (9)$$

We define misperception as the absolute value (in pp) of either ATR misperception or MTR misperception for two reasons. First, we are only interested what drives misperception regardless of the kind of misperception. With this approach, we also abstract from over- and underestimates, and the coefficients can be interpreted more easily. Second, we separately investigate heterogeneity in over- and underestimations.

We cluster drivers in the following two categories:

Firm Characteristics. We analyze four firm characteristics. (1) *Employees*: The number of employees allows us to proxy a firm’s size. As shown in Graham et al. (2017), larger firms often employ qualified tax personnel due to facing more tax-related duties and responsibilities (e.g., fulfilling compliance requirements or tax planning opportunities). Following this argumentation, size should decrease tax rate misperception. In addition, the tax schedule for non-corporations involves size-related calculation difficulties: Firms with lower profits are subject to the direct progressive part of the German income tax schedule, making it more difficult to determine both ATRs and MTRs than for firms with higher profits, which are subject to the proportional marginal tax rate of 42% or 45%. For this reason, the size-effect is likely to be stronger for non-corporations. (2) *Corporation*: While non-corporations are taxed according to the direct progressive German income tax schedule and there is a complex interaction between trade and income tax, retained profits of corporations underlie a flat tax rate without any interdependence between corporate and trade tax. Therefore, the legal form represents a proxy for the degree of tax code complexity (Hoppe et al. 2021). Given the more complex taxation of non-corporations and insights of the literature that more complexity translates into more tax-related misperception (e.g., Bratten et al. 2017; Sielaff and Wolf 2016), being a corporation should decrease tax rate misperception in case of retained profits. If profits are distributed, the interaction between corporate and shareholder taxation leads to an increase of complexity and an expected increase in tax rate misperception of corporations. (3) *Loss*: Firms that have incurred losses in previous years might have tax loss carryforwards that reduce their current tax rate. Additionally, *Loss* might have a rather indirect effect on the accuracy of tax rate estimates as losses increase tax complexity due to loss-offset regulations and likewise tax uncertainty of the firm. Fochmann et al. (2012) show in a lab experiment that respondents have a biased perception of loss-offset regulations. Hence, we expect that *Loss* is positively associated with tax rate misperception. (4) *Tax Assistance*: From the literature on individuals (Ballard and Gupta 2018; Gideon 2014; Rupert and Fischer 1995) it is known that using *Tax Assistance* of a tax adviser in the tax preparation process, leads to more misperception since tax knowledge is outsourced. We assume a similar

pattern for firms and predict a positive relation between firms using (external) *Tax Assistance* and tax rate misperception.

Personal Characteristics. We analyze four personal characteristics of the responding firm representative. (5) *Tax Knowledge Index*: Findings from the literature on tax knowledge are mixed: Graham et al. (2017) report a positive effect of managers' tax knowledge on the appropriate consideration of taxes in business decisions, whereas Slemrod (2006) finds no effect of tax knowledge on individuals' misperception of tax schedule progressivity. Therefore, the effect of tax knowledge on tax rate misperception is unclear. Following Stantcheva (2021), we build a comprehensive *Tax Knowledge Index* that increases with showing a better understanding of basic tax concepts. It comprises Tax Knowledge, Tax Schedule, Tax Rate Choice, and Business Decisions. Tax Knowledge is the self-reported tax knowledge (0/1); Tax Schedule is for non-corporations 1 if $ATR < MTR$, otherwise 0 and for corporations 1 if $MTR = ATR$, otherwise 0; Tax Rate Choice is 1 when using the MTR in business decisions, otherwise 0; and Business Decisions is the frequency of incorporating taxes in business decisions (1,5). We include these variables as *Z*-scores. We achieve the transformation into *Z*-scores by subtracting the group mean from each observation and then dividing this figure by the group standard deviation; leading for each *Z*-score having a mean of 0 and standard deviation of 1 (see Appendix A2.). The *Tax Knowledge Index* is standardized as well (*Z*-score). (6) *Tax Satisfaction*: The utility function of a firm manager may also include satisfaction considerations which might affect their tax rate estimates.³¹ We construct a *Tax Satisfaction Index* that increases when firms are more satisfied with the current tax system in Germany. It comprises the following indicator variables: Tax Cut, Tax Complexity, Trust in Government, Tax Compliance Costs, and Peers' Tax Burden. Tax Cut is the difference between reported ATR and an ATR that firms regard as fair (-1,1); Tax Complexity is the perceived level of tax complexity (1,5); Trust in Government is the level of trust in public spending (1,5); Tax Compliance Costs are the reported tax compliance costs relative to the total compliance costs (0,1); and Peer's Tax Burden indicates how firms rate their own tax burden compared to the tax burden of competitors (0,1). Again, we include these variables as *Z*-scores. *Tax Satisfaction Index* is standardized as well (*Z*-score). (7) *Female*: Building on the existing literature on individuals, there is mixed evidence: Females tend to overestimate their ATR (Blaufus et al. 2015) and underestimate tax schedule progressiveness far less than men (Slemrod 2006). However, there is also evidence that gender does not play a role in individuals' tax misperception at all (Ballard and Gupta 2018; Fujii and Hawley 1988; Gideon 2014). Hence, we cannot predict the effect of gender on firms' tax rate misperception. (8) *Manager*: According to the findings of Blaufus et al. (2015),

³¹ Trust in the government has also a positive effect in other settings (see Eberhartinger et al. (2020), for a positive effect on tax bargaining; Kuziemko et al. (2015) and Stantcheva (2021), for a positive effect on the attitudes towards redistributive policies, and Slemrod (2006) for the assessment of the US tax system as fair)

entrepreneurs and employees show no difference in the misperception of income tax rates. Hundsdoerfer and Sichtmann (2009) show that about one-quarter of self-employed physicians do not know their MTR and Graham et al. (2017) find that managers confuse ATRs and MTRs within decision-making processes. These results indicate that working in an executive position does not necessarily imply a better understanding of tax concepts. Therefore, we assume that working in an executive position does not affect tax rate misperception.

We provide summary statistics of the before mentioned variables in Table 5 and a more granular summary statistic in A2 11 . Additional summary statistics by legal form are provided in the Appendix A4.3.

< insert Table 5 about here >

In a first step, we analyze overall ATR and MTR misperception without distinguishing between over- and underestimation. The results of the regression analysis are shown in Table 6.

< insert Table 6 about here >

The regression analysis confirms that *Corporations* have a significantly lower extent of ATR_{retained} misperception than non-corporations ($p < 0.01$). This is in line with our expectations and can be explained by the rather simple flat tax on retained earnings. However, if profits are distributed, this effect vanishes. This is because estimating their tax rate becomes far more complex due to the interplay of the taxes on the corporate and shareholder level.³² *Employees* and *Employees x Corporation* show no significant effect on ATR misperception. In contrast to ATR misperception, there is no association between *Corporation* and MTR misperception at all. Further, MTR misperception is positively associated with *Employees* ($MTR_{\text{retained}} p < 0.05$; $MTR_{\text{distributed}} p < 0.1$) and MTR_{retained} is negatively associated with *Employees x Corporation* ($p < 0.05$). Since the negative coefficient exceeds the positive coefficient of *Employees* we find larger corporations exhibit lower MTR_{retained} misperception whereas the opposite holds true for non-corporations. Firm size - as in Graham et al. (2017) - does not seem to be a good proxy for employing well-educated tax experts in our case, as we find only weak results for it in terms of MTR.

With regard to personal characteristics, we find that *Tax Knowledge Index* and *Tax Satisfaction Index* are highly significant both for retained and distributed profits ($p < 0.01$). Higher *Tax Knowledge* leads to less ATR and MTR misperception. Also, Graham et al. (2017) finds a negative association with accounting-related education among corporate tax managers, while the literature on individuals does not provide a clear pattern for education / tax knowledge (Gensemer et al. 1965; Slemrod 2006; Rupert and Fischer 1995; Blaufus et al. 2015; Ballard and Gupta 2018; Fujii and Hawley 1988; Gideon 2014; Amberger et al. 2016). Higher *Tax*

³² These results are in line with findings of Abeler and Jäger (2015) and Rupert et al. (2003) who point out that complexity alters individuals' behavior with regard to taxes.

Satisfaction leads to less ATR and MTR misperception. This is consistent with Ballard and Gupta (2018) who examine individual misperception and find stronger misperception among respondents who believe they are taxed too high or who assume taxes are spent ineffectively. Other personal characteristics, which are known from the literature on individual misperception, such as gender or position in the firm do not have an effect.

After analyzing overall ATR and MTR misperception, we investigate over- and underestimation separately to decompose our findings on overall misperception. Table 7 shows our regression results of ATR and MTR misperception differentiated by over- and underestimation.

< insert Table 7 about here >

Overall, we find that larger firms report significantly lower ATR and MTR as they show less overestimation but more underestimation ($p < 0.01$; $p < 0.05$). Since the interaction effect of *Employees x Corporation* attenuates the size effect in case of the ATR, the size effect is only prevalent for non-corporations, i.e. they are less likely to overestimate and more likely to underestimate the ATR as their size increases. This is partially in line with our argumentation that a more salient tax rate leads to less misperception. *Corporations* overestimate ATR significantly less than non-corporations ($p < 0.01$). We argue that this effect is due to the complexity of the tax system created by the progressive income tax schedule and the complex interaction of IT and TT. However, this effect does not show up in MTR estimates because the (higher) benchmark MTRs (42%/45%) for non-corporations are more salient. *Tax Assistance* and *Loss* are no robust drivers of ATR or MTR over- and underestimation. It is possibly induced by our design that *Loss* has hardly an effect on tax rate misperception. Since we lack information on tax loss carryforwards, actual tax rates are calculated without offsetting losses. The absence of a difference between loss-making and profit-making firms indicates that firms asked to estimate the tax burden on a given profit may neglect the tax-reducing effect of tax loss carryforwards.

Personal characteristics like the assessment of the German tax system are important to be considered as well. *Tax Satisfaction Index* has a negative effect on the overestimation of ATR and MTR ($p < 0.01$) and no or a positive effect on the underestimation of ATR and MTR. Overall, firms tend to incorporate their satisfaction with the German tax system by assessing their tax burden as relatively lower. Ballard and Gupta (2018) find similar results for individuals. *Tax Knowledge Index* has no effect on ATR and MTR overestimation but a significant negative effect on the underestimation of ATRs and MTRs ($p < 0.01$). An interesting pattern emerges from this: Overestimates seem to be driven more by a dissatisfaction with the tax system and underestimates by a lack of knowledge. Being a *Female* or *Manager* has no robust effect.

Managers tend to underestimate ATRs ($p < 0.05$) less.

In sum, both firm and personal characteristics play a role. With respect to firm characteristics, we can confirm that the complexity of the legal form-related taxation and the interaction of taxation at different levels increase tax rate misperception. With regard to personal characteristics, satisfaction with the tax system and, unsurprisingly, tax knowledge are relevant factors.

4.3 Tax Rate Choice & Misperception

Our results illustrate so far that firms struggle with estimating their tax rates appropriately and understanding the underlying tax schedule. Therefore, the question arises if and how this misperception might translate into firms' behavior. Graham et al. (2017) have already shown that even managers of large public and private corporations often do not use their firm's MTR in their decision processes.³³ Following this approach, in a first step, we investigate which tax rates our surveyed firms incorporate in their business decisions.³⁴ Our respondents could choose from different common tax rate alternatives: ATR, MTR, statutory tax rate (STR), self-defined tax rate (self-set), or another tax rate (other). Figure 9 presents the tax rates used in investment decisions per legal form:

< insert Figure 9 about here >

We find the ATR as the most common tax rate incorporated in investment decisions and confirm the results of Graham et al. (2017) for a sample of primarily small and medium-sized German firms. About 40% of the firms over all legal forms use their ATR in the decision-making process. Less than 20% use their MTR.³⁵ This indicates that managers like individuals struggle with the concept of MTRs.³⁶ Roughly 12% of our firms do not consider taxes in investment decisions at all which is also in line with Graham et al. (2017).

To avoid biased decisions, using MTRs in investment decisions is especially important for firms that are subject to the progressive income tax schedule. Therefore, it is striking that we do not find more obvious differences between the share of corporations and non-corporations choosing the MTR.

In a second step, and to further analyze associations between firm and personal characteristics and tax rate choice, we perform logit regressions.

³³ Depending on the type of business decision only 8.8% to 12.5% of the surveyed managers use the MTR.

³⁴ For this purpose, we ask our respondents: "Which of the following tax rates do you use in your investment decision?" We also analyze whether firms incorporate taxes in their investment decisions at all.

³⁵ Related, Hüsing (1999) and Wittmann (1986) illustrate that firms do not consider taxes appropriately in business decisions and Bartolome (1995) provides evidence that individuals' often use the ATR instead of the MTR as well. But, using average instead of marginal figures appears not only in a tax setting. Shin (1985) finds that the average price predicts electricity demand better than the marginal price. Faulhaber and Baumol (1988) indicate, at least until the 1970s, most firms use average rather than marginal costs in their pricing decisions.

³⁶ For individuals Gideon (2014) (p. 26) concludes: "The main take-away from analyzing heterogeneity is the general cluelessness about marginal tax rates."

$$Tax\ Rate\ Choice_i = \alpha + \beta \cdot Drivers_i + \epsilon_i \quad (10)$$

The dependent variable *Tax Rate Choice* comprises the specification *Choice ATR* (equals one for firms that chose the ATR), *Choice MTR* (equals one for firms that chose the MTR), and *Choice STR* (equals one for firms that chose the STR). We choose the independent variables based on Graham et al. (2017) in case they are on hand for our sample. This way, we can examine whether German firms, especially firms of different size, show similar patterns as found by Graham et al. (2017). Further, we account for tax rate misperception via *Tax Misperception Index*. *Tax Misperception Index* incorporates *ATR Misperception*, *MTR Misperception*, and *Tax Schedule Misperception*. Our regression results are displayed in Table 8.

< insert Table 8 about here >

We find that *Employees* is negatively associated with choosing the STR ($p < 0.05$). An explanation could be that bigger firms have their own tax departments, which determine and report rather ATRs and MTRs than STRs. These ATRs and MTRs are than used within the decisions-making process. Further, perceived *Tax Complexity* is slightly positively associated with using the ATR in investment decisions ($p < 0.1$), but negatively with using the STR ($p < 0.01$). The reason could be that respondents rather use heuristics that are closer to the ATR. They seem to feel more confident in relying on their ATR than knowing what the (combined) STR is. Furthermore, we find that hiring *Tax Assistance* is significantly negatively correlated with choosing the MTR ($p < 0.05$). Obviously, using advisory services is associated with outsourcing tax knowledge. This in turn leads to respondents knowing less on how to properly incorporate taxes into the decision-making process (for individuals it is shown that tax assistance increases their tax rate misperception (Ballard and Gupta 2018; Gideon 2014; Rupert and Fischer 1995)). Further, having *Misperception* is negatively related with using the MTR ($p < 0.01$) and positively related with using the STR ($p < 0.05$). An explanation could be, that having trouble understanding the tax rate schedule and having trouble reporting the firms actual tax rate, leads to choosing a more general figure, namely the STR.

Our results clearly illustrate that tax rate misperception biases tax rates used in investment decisions and, hence, might also result in distorted investment decisions. Building on our findings on tax rate misperception also indicates that there are two channels through which misperception enters into investment decisions, first, the magnitude of ATR or MTR misperception and, second, misperception on which tax rate to apply. It is therefore necessary to examine the interaction of tax rate misperception and tax rate choice in investment decisions in a third step. By doing this, we expand the study of Graham et al. (2017) by adding an additional

layer. We proceed as follows: First, we group firms based on their tax rate choice.³⁷ Second, we compare the individually *reported tax rate* (ATR or MTR) which is, according to the respective, used in the investment decision with the actual MTR of each firm. Third, we evaluate our findings. Based on our previous approach, we define deviations of ± 5 pp from the actual MTR as still accurate. In Table 9 we illustrate our results.

< insert Table 9 about here >

Table 9 describes an interesting phenomenon: The negative effects of using the ATR instead of the MTR in investment decisions, can be attenuated or even balanced by firms' tax rate misperception. Since firms tend to overestimate their ATRs, their estimated ATR deviates less than ± 5 pp from their actual MTR (in 44.4% of the cases) and hence, firms use the appropriate tax rate due to ATR misperception. Therefore, misperception needs to be considered as an additional feature when estimating the cost of using inappropriate tax rates in business decisions. However, misperception results in using inappropriate tax rates in 31.4% of firms which use the MTR in investment decisions. Overall, 51.5% of our ATR/MTR firms use the accurate tax rate in investment decisions. In addition to investment decisions, we also asked about financing decisions. For finance decisions the results are similar.

5 Conclusion

In this study, we explore whether and to what extent firms in the legal form of sole proprietorships, partnerships, and corporations misperceive their tax rates. Further, we examine drivers of tax rate misperception and the link between tax rate misperception and business decisions. We adopt an innovative approach in which (1) firms estimate their ATR and MTR based on a *given profit* and (2) we calculate actual ATRs and MTRs to benchmark reported tax rates (for non-corporations incorporating values from the Official Tax Statistics). This approach yields robust estimators of firms' tax rate misperception.

We find a large share of firms misperceiving their tax rates: More than 60% (50%) misperceive their ATR (MTR). Corporations are better in estimating their tax rates for retained profits which might be explained by the simple flat tax rate structure. Nevertheless, more than 40% of corporations misperceive their ATR and MTR by more than ± 5 pp. This share even increases to about two thirds when distributed profits are considered. We assume this to be explained by the complexity added through taxation of shareholders. While corporations, on average, underestimate both tax rates on distributed profits over- and underestimates for retained profits nearly offset each other. In contrast, non-corporations show a different pattern of misperception: ATRs are overestimated, while MTRs are underestimated. Next to this tax rate misperception,

³⁷ We only compare the reported ATR and MTR since we cannot determine the STR respondents thought of when choosing the STR (see Figure 9).

we find that more than half of non-corporations misperceive the relation of ATRs to MTRs induced by the progressive German income tax schedule. Non-corporations strongly tend to linearize the tax schedule. Even though corporations are subject to a flat tax structure, one quarter misperceives the relation between ATRs and MTRs. Further, our results illustrate that if one tax rate is misperceived so is the other.

In a second step, we identify drivers of misperception: Legal form, the size as well as tax knowledge and satisfaction with the tax system influence the degree of misperception. In a third step, we analyze the link between tax rate misperception and tax rates which are considered in investment decisions. First, in line with previous literature, we demonstrate that firms most frequently use ATRs in their investment decisions – instead of using the appropriate MTR. But, we are the first to show, that this effect is attenuated by tax rate misperception. Due to overestimation of their ATR, around 40% of these firms use unintendedly their actual MTR, leading to less bias in investment decisions than expected.

Our findings strongly contribute to closing the existing research gap on firms' tax misperception and answer to Blaufus et al. (2022) call for further research. Quantifying tax rate misperception helps to predict firms' behavior in response to taxes and tax reforms more accurately. Still, there is need for further research: Amongst others, it seems especially promising to develop a model allowing to include heterogeneous tax rate misperception in real effect analyses.

6 References

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7 Tables and Figures

Table 1: Summary Statistics of Survey Sample

	Sample N = 519	Business Register 2020 N = 3,374,583
Legal Form		
Sole Proprietorship	52%	63.0%
Partnership	22.5%	12.8%
Corporation	25.4%	24.2%
Employees		
0-9	63.2%	86.9%
10-49	25.4%	10.5%
50-249	5.8%	2.2%
250 and more	5.6%	0.5%

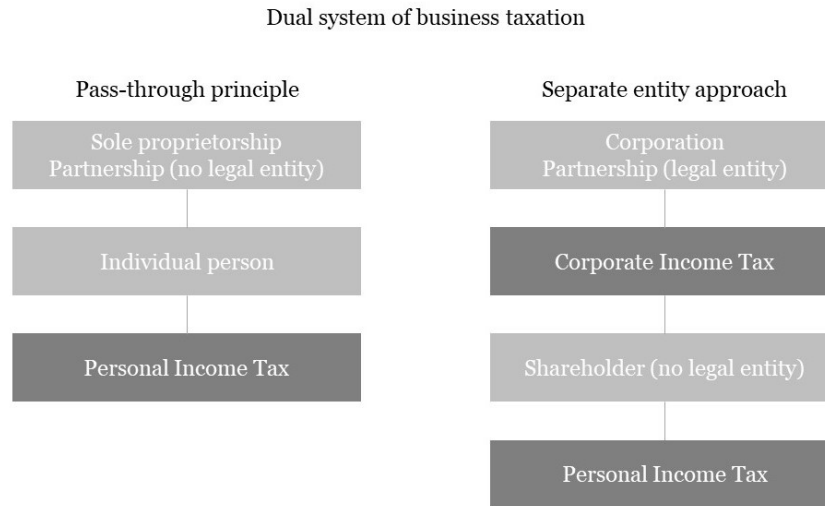
Notes: This table compares firm characteristics of our sample with the official German Business Register 2020.

Table 2: Summary Statistics of Sample

Statistic	N	Mean	St. Dev.	Min	Median	Max
Profit	519	3,639,718.000	29,387,052.000	20,500	75,000	369,000,000
Employees	519	607.181	7,107.894	1	6	150,000
Corporation	519	0.254	0.436	0	0	1
Sole Proprietorship	519	0.520	0.500	0	1	1
Partnership	519	0.225	0.418	0	0	1
Profit in 2020	497	0.853	0.354	0	1	1
Tax Advisor	519	0.894	0.308	0	1	1
Tax Department	519	0.044	0.206	0	0	1
Male	519	0.788	0.409	0	1	1
Female	519	0.191	0.393	0	0	1
Manager	506	0.972	0.164	0	1	1
Tax Knowledge	519	0.771	0.421	0	1	1
Tax Complexity	510	4.643	0.699	1	5	5
Trust in Government	514	1.823	0.927	1	2	5
Tax Compliance Costs	514	0.332	0.209	0.000	0.300	1.000

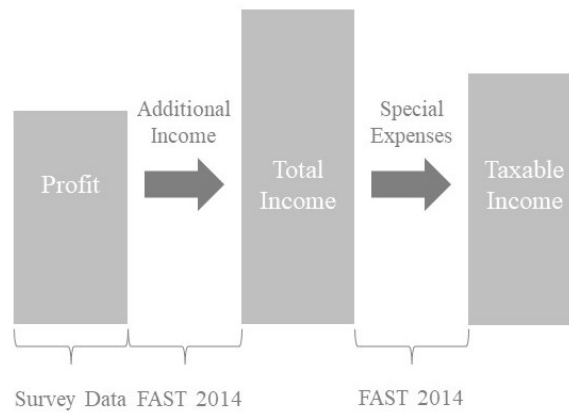
Notes: This table presents summary statistics of our sample. Variable definitions and a more detailed version of this summary statistics can be found in Appendix A2.

Figure 1: Dual system of business taxation



Notes: This figure illustrates the dual system of business taxation following Endres and Spengel (2015).

Figure 2: Approach to determine Taxable Income



Notes: This figure illustrates the determination of the Taxable Income based on the *given profit* from our survey, *Additional Income* (FAST 2014) and *Special Expenses* (FAST 2014). This stylized illustration only sketches the process of determining the *Taxable Income*, it is not supposed and does not reflect the actual size of *Additional Income* and *Special Expenses*. It is important to note that *Additional Income* can be negative.

Table 3: Profit and Taxable Income

		Sole Proprietorships		Partnerships	
		Single	Married	Single	Married
①	Profit	100.0%	100.0%	100.0%	100.0%
	+ Additional Income	1.8pp	30.7pp	3.8pp	39.5pp
②	Total Income	101.8%	130.7%	103.8%	139.5%
	– Special Expenses	-16.3pp	-23.8pp	-8.2pp	-16.5pp
③	Taxable Income	85.5%	106.9%	95.7%	123%

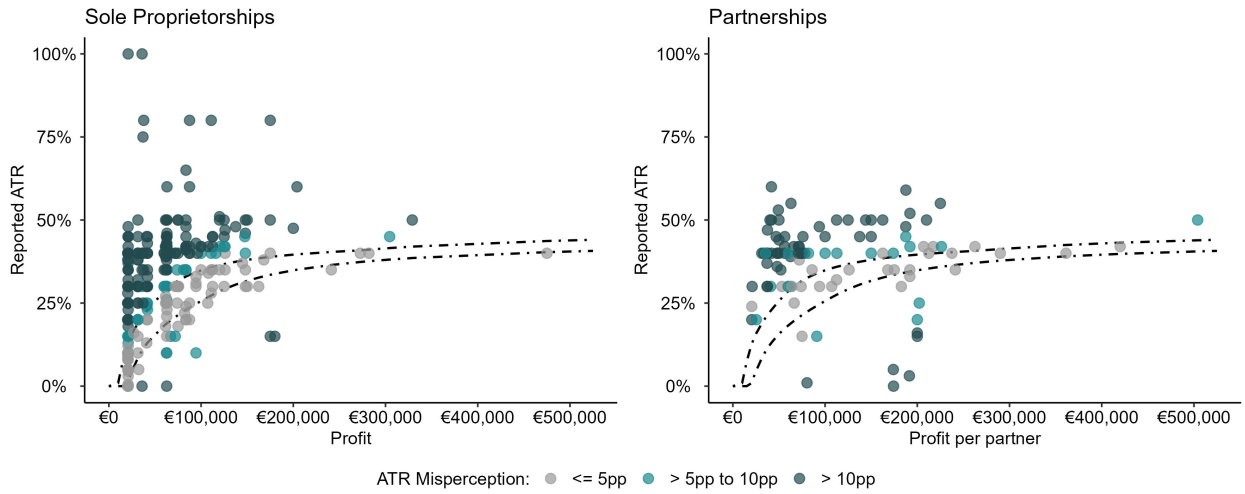
Notes: This table shows mean imputed values of *Additional Income* and *Special Expenses* relative to Profit by the four identified groups. Profit is the *given profit* in our survey that is attributed evenly among the number of partners.

Table 4: ATR and MTR Misperception

	Sole Proprietorships	Partnerships	Corporations	
	N = 270	N = 117	retained	distributed
Reported ATR	32.7%	36.9%	31.4%	43.3%
Actual ATR	19.7%	30.9%	29.8%	48.3%
ATR Misperception	13pp***	6.1pp***	1.6pp**	-5pp***
Share >5pp (>10pp)	71.1% (56.3%)	73.5% (58.1%)	43.2% (22%)	65.2% (43.9%)
ATR Overestimation	15.6pp	12.7pp	5.9pp	8.7pp
Share >5pp (>10pp)	67.8% (54.8%)	57.3% (44.4%)	28% (13.6%)	19.7% (11.4%)
ATR Underestimation	-4.4pp	-12.3pp	-5.8pp	-12.8pp
Share >5pp (>10pp)	3.3% (1.5%)	16.2% (13.7%)	15.2% (8.3%)	45.5% (32.6%)
Reported MTR	31.3%	36.6%	31.9%	43.3%
Actual MTR	34.1%	42.1%	29.8%	48.3%
MTR Misperception	-2.8pp***	-5.6pp***	2.1pp**	-5pp***
Share >5pp (>10pp)	57.8% (39.6%)	57.3% (37.6%)	46.2% (29.5%)	64.4% (49.2%)
MTR Overestimation	9.6pp	5.9pp	8.2pp	9.4pp
Share >5pp (>10pp)	23.7% (14.1%)	21.4% (9.4%)	31.1% (18.2%)	19.7% (14.4%)
MTR Underestimation	-13.3pp	-16.5pp	-7.5pp	-14.4pp
Share >5pp (>10pp)	34.1% (25.6%)	35.9% (28.2%)	15.2% (11.4%)	44.7% (34.8%)

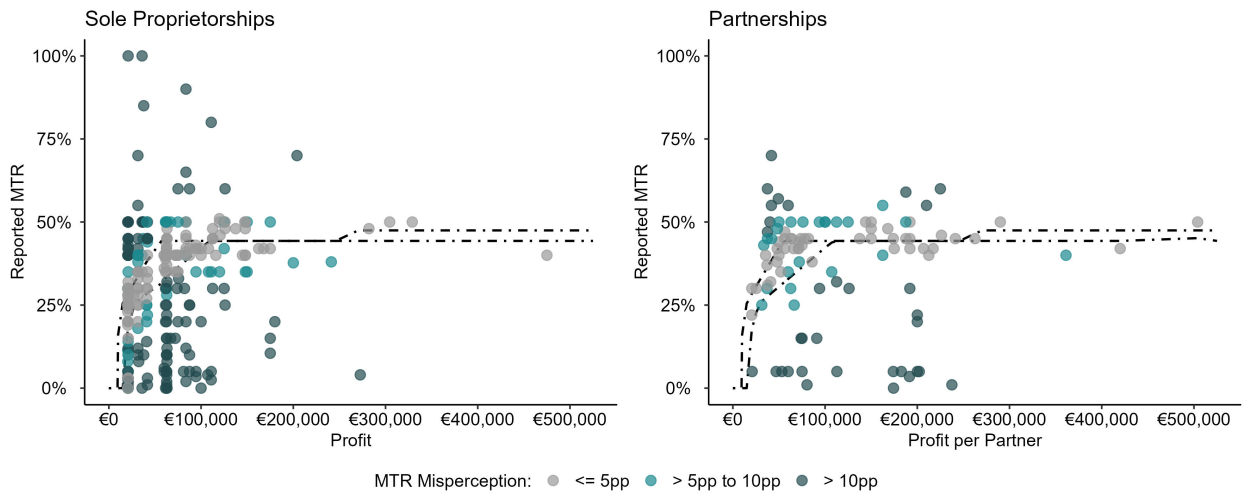
Notes: This table shows descriptive evidence of ATR and MTR Misperception. Reported ATR/MTR is the mean value of reported ATRs by legal form. Actual ATRs/MTRs are calculated benchmark ATRs. ATR/MTR Misperception is calculated as Reported ATR/MTR minus Actual ATR/MTR. ***, **, and * denote significance at the 1%, 5%, and 10% levels of a two-sided t-test (ATR/MTR Misperception = 0). ATR/MTR Overestimation measures the average ATR/MTR Misperception in case of positive deviations, and ATR/MTR Underestimation measures the average ATR/MTR Misperception in case of negative deviations. Share >5pp (>10pp) gives the share of all firms that misperceive, overestimate, or underestimate the Actual ATR/MTR by more than ± 5 pp (± 10 pp).

Figure 3: Reported ATRs of Sole Proprietors and Partnerships



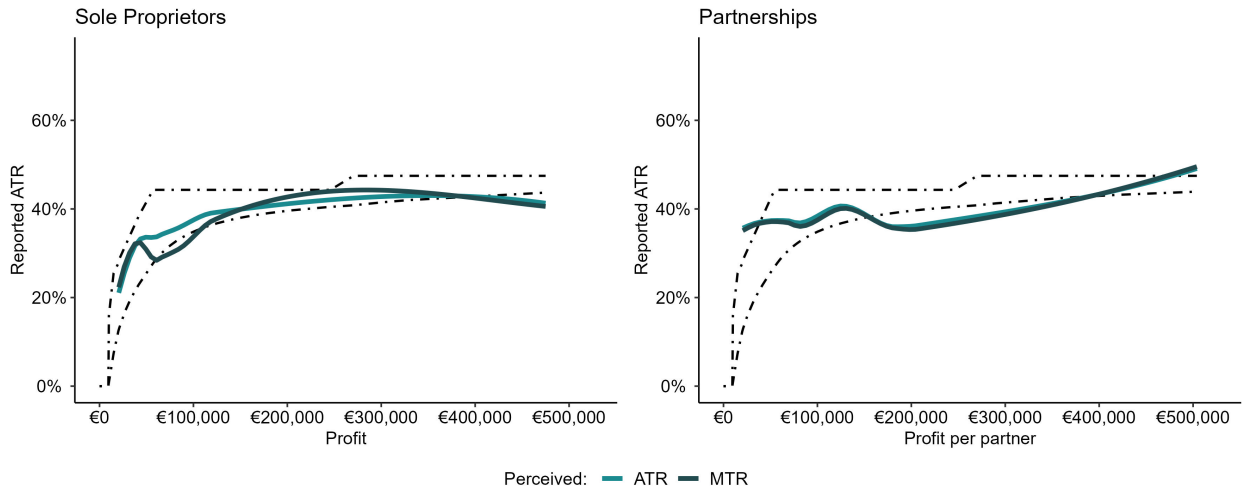
Notes: This figure shows reported ATRs of sole proprietors and partnerships. All points represent reported ATRs, the dashed lines illustrate ATRs on profits of married (lower line) and single (upper line) taxpayers in Germany. The level of misperception is indicated by the color of each point and misperception is identified based on ATRs of taxable income. For presentation reasons, the figure does not include observations for profits above €500,000.

Figure 4: Reported MTRs of Sole Proprietorships and Partnerships



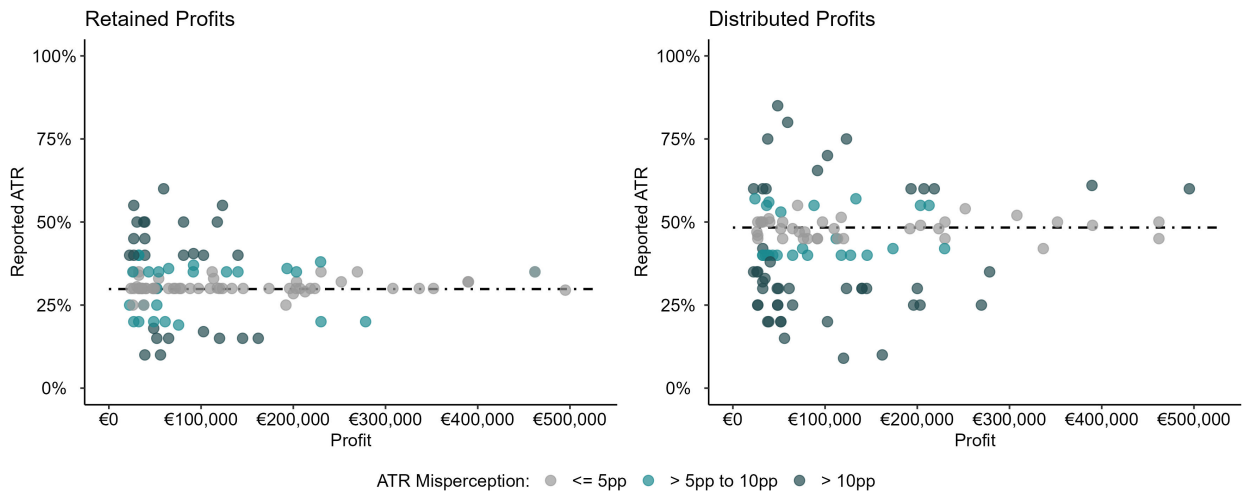
Notes: This figure shows reported MTRs of sole proprietors and partnerships. All points represent reported ATRs, the dashed lines illustrate ATRs on profits of married (lower line) and single (upper line) taxpayers in Germany. The level of misperception is indicated by the color of each point and misperception is identified based on ATRs of taxable income. For presentation reasons, the figure does not include observations for profits above €500,000.

Figure 5: Reported ATR-MTR Relation of Sole Proprietorships and Partnerships



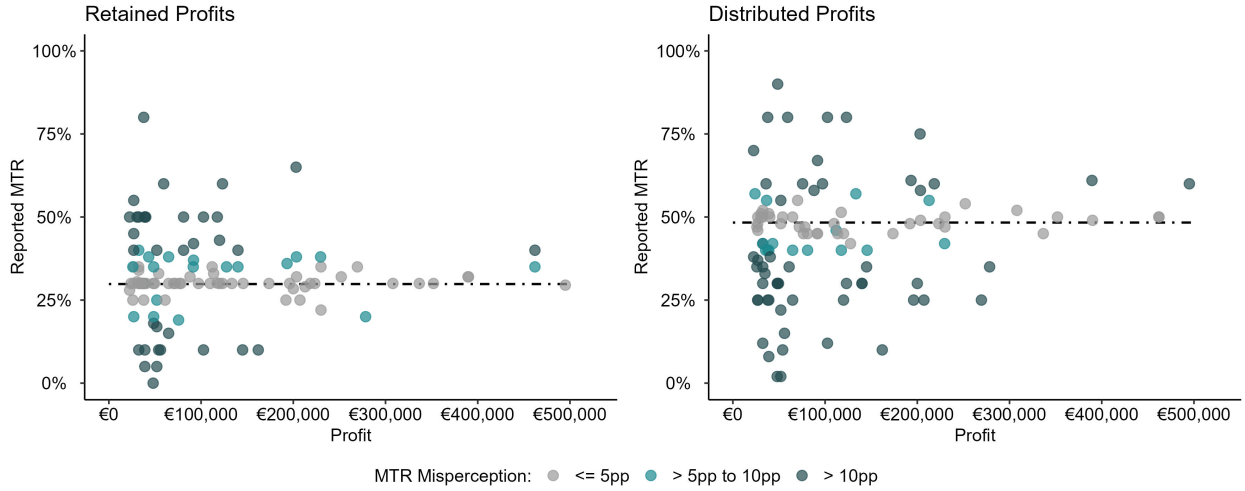
Notes: This figure shows mean reported ATRs and MTRs for sole proprietors and partnerships. The estimated mean lines are generated by locally estimated scatterplot smoothing. The dot-dashed lines are reference lines for the actual ATR (lower) and MTR (upper) for a single taxpayer. For presentations reasons, the figure does not include observations for profits above €500,000.

Figure 6: Reported ATRs of Corporations



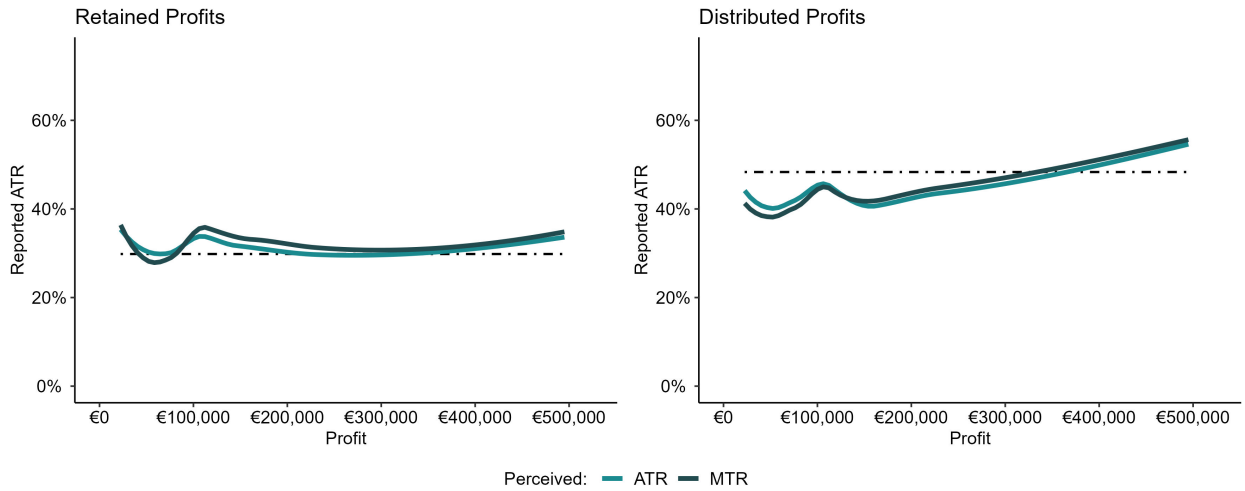
Notes: This figure shows ATR Misperception of corporations in case of retained and distributed profits. All points represent reported ATRs, the dashed line indicates the respective corporate tax rate at a trade tax multiplier of 400%. The level of misperception is indicated by the color of each point. For presentation reasons, the figure does not include further observations for profits above €500,000.

Figure 7: Reported MTRs of Corporations



Notes: This figure shows ATR Misperception of corporations in case of retained and distributed profits. All points represent reported ATRs, the dashed line indicates the respective corporate tax rate at a trade tax multiplier of 400%. The level of misperception is indicated by the color of each point. For presentation reasons, the figure does not include observations for profits above €500,000.

Figure 8: Reported ATR-MTR Relation of Corporations



Notes: This figure shows mean reported ATRs and MTRs for corporations in case of retained and distributed profits. The estimated mean lines are generated by locally estimated scatterplot smoothing. The dot-dashed line represents the average actual ATR and MTR. For presentations reasons, the figure does not include observations for profits above €500,000.

Table 5: Summary Statistics of Drivers

Statistic	N	Mean	St. Dev.	Min	Median	Max
ATR _{retained} Misp.	478	0.113	0.103	0.000	0.093	0.647
ATR _{distributed} Misp.	478	0.126	0.105	0.000	0.111	0.647
MTR _{retained} Misp.	478	0.102	0.108	0.00005	0.057	0.515
MTR _{distributed} Misp.	478	0.113	0.113	0.0002	0.071	0.515
Employees	478	1.992	1.730	0.000	1.792	11.918
Corporation	478	0.264	0.441	0	0	1
Loss	478	0.184	0.388	0	0	1
Tax Assistance	478	0.906	0.292	0	1	1
Tax Knowledge Index	478	0.000	1.000	-2.381	-0.046	2.274
Tax Satisfaction Index	478	0.000	1.000	-5.798	0.001	2.847
Female	478	0.180	0.385	0	0	1
Manager	478	0.977	0.150	0	1	1

Notes: This table presents summary statistics of our variables used in the regression analysis. For sole proprietors and partnerships there is no difference between retained and distributed earnings. This display is only to illustrate differences in corporations' tax rate. Variable definitions and a more detailed version of this summary statistics can be found in Appendix A2.

Table 6: OLS Regression of ATR and MTR Misperception

	<i>Dependent variable:</i>			
	ATR _{retained}	MTR _{retained}	ATR _{distributed}	MTR _{distributed}
	(1)	(2)	(3)	(4)
Employees	-0.007 (0.005)	0.008** (0.004)	-0.007 (0.005)	0.008* (0.004)
Corporation	-0.070*** (0.021)	0.026 (0.022)	-0.040 (0.027)	0.042 (0.029)
Employees x Corporation	0.003 (0.008)	-0.019** (0.008)	0.011 (0.010)	-0.009 (0.009)
Loss	0.015 (0.013)	0.012 (0.014)	0.007 (0.014)	0.001 (0.014)
Tax Assistance	-0.001 (0.016)	0.001 (0.015)	-0.006 (0.018)	0.00001 (0.016)
Tax Knowledge Index	-0.011*** (0.004)	-0.028*** (0.004)	-0.016*** (0.004)	-0.032*** (0.005)
Tax Satisfaction Index	-0.028*** (0.006)	-0.015*** (0.005)	-0.026*** (0.006)	-0.011** (0.005)
Female	-0.011 (0.011)	-0.007 (0.012)	-0.001 (0.011)	0.001 (0.013)
Manager	0.006 (0.018)	0.018 (0.029)	-0.013 (0.030)	0.002 (0.038)
Constant	0.136*** (0.022)	0.074** (0.032)	0.158*** (0.033)	0.091** (0.039)
Observations	478	478	478	478
R ²	0.203	0.121	0.102	0.097
Adjusted R ²	0.187	0.104	0.085	0.079

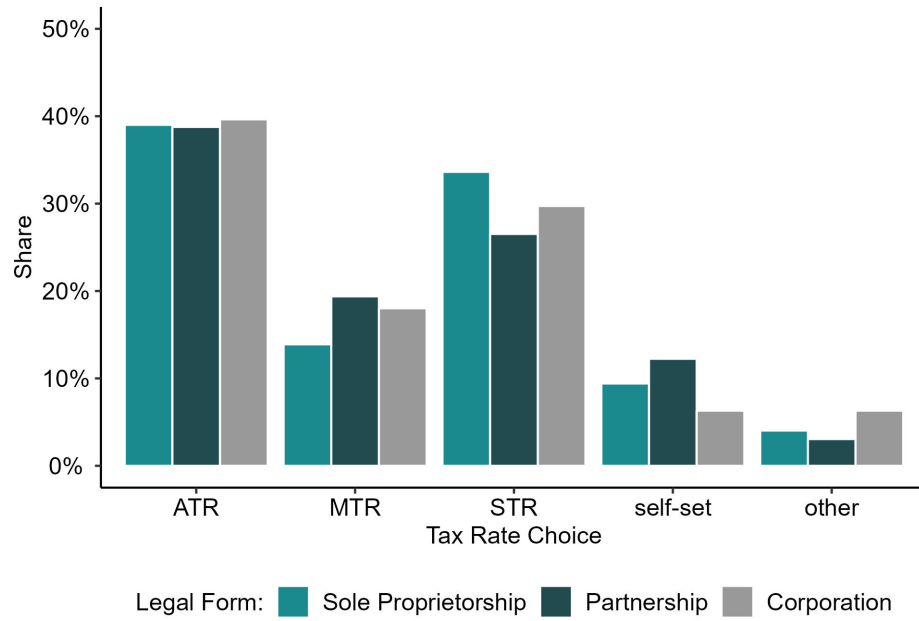
Notes: This table shows the OLS regression results of ATR and MTR misperception. The dependent variables in columns (1) and (2) represent the case where corporations report their ATR and MTR on retained profits, and the dependent variables in columns (3) and (4) represent the case where corporations report their ATR and MTR on distributed profits. All variables are defined in more detail in the Appendix A2. Robust standard errors are in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$.

Table 7: OLS Regression of ATR and MTR Over-/Underestimation

	<i>Dependent variable:</i>							
	ATR _{retained}		MTR _{retained}		ATR _{distributed}		MTR _{distributed}	
	Over	Under	Over	Under	Over	Under	Over	Under
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Employees	-0.021*** (0.004)	0.020*** (0.007)	-0.012** (0.005)	0.015*** (0.005)	-0.021*** (0.004)	0.020*** (0.007)	-0.012*** (0.005)	0.016*** (0.006)
Corporation	-0.098*** (0.019)	0.053* (0.029)	0.035 (0.022)	-0.017 (0.031)	-0.097*** (0.029)	0.108*** (0.032)	0.015 (0.033)	0.048 (0.034)
Employees x Corporation	0.016** (0.006)	-0.022** (0.010)	-0.002 (0.007)	-0.016 (0.011)	0.022*** (0.008)	-0.017 (0.011)	0.007 (0.008)	-0.013 (0.011)
Loss	0.032** (0.015)	0.011 (0.014)	0.027 (0.017)	-0.012 (0.020)	0.023 (0.017)	-0.0001 (0.017)	0.004 (0.019)	-0.018 (0.019)
Tax Assistance	0.025* (0.014)	-0.009 (0.020)	0.021 (0.017)	0.0004 (0.022)	0.016 (0.015)	0.003 (0.028)	0.010 (0.018)	0.014 (0.022)
Tax Knowledge Index	-0.006 (0.004)	-0.016*** (0.006)	-0.005 (0.004)	-0.042*** (0.006)	-0.008* (0.005)	-0.024*** (0.008)	-0.003 (0.005)	-0.047*** (0.007)
Tax Satisfaction Index	-0.037*** (0.007)	0.014** (0.007)	-0.030*** (0.006)	-0.007 (0.007)	-0.041*** (0.007)	0.016* (0.008)	-0.031*** (0.007)	-0.005 (0.007)
Female	-0.017 (0.013)	0.022 (0.017)	-0.020* (0.012)	0.010 (0.019)	-0.011 (0.013)	0.025 (0.021)	-0.009 (0.012)	0.009 (0.020)
Manager	0.016 (0.014)	-0.051** (0.021)	0.009 (0.023)	0.016 (0.041)	0.008 (0.019)	-0.199*** (0.028)	-0.009 (0.042)	-0.007 (0.049)
Constant	0.126*** (0.020)	0.060* (0.035)	0.062** (0.029)	0.085* (0.044)	0.143*** (0.024)	0.197*** (0.049)	0.091** (0.046)	0.093* (0.051)
Observations	380	98	245	233	347	131	219	259
R ²	0.307	0.356	0.206	0.194	0.260	0.314	0.151	0.163
Adjusted R ²	0.290	0.290	0.176	0.161	0.240	0.263	0.114	0.133

Notes: This table shows OLS regression results of ATR and MTR misperception, which is divided into overestimation and underestimation. The dependent variables in columns (1)-(4) represent the case where corporations report their ATR and MTR on retained profits, and the dependent variables in columns (5)-(8) represent the case where corporations report their ATR and MTR on distributed profits. Note, that underestimates like overestimates have a positive sign. All variables are defined in more detail in the Appendix A2. Robust standard errors are in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$.

Figure 9: Tax Rate Choice by Legal Form



Notes: This figure shows the average shares of chosen tax rates in investment decisions (N = 432).

Table 8: Logit Regression of Tax Rate Choice - Investment Decision

	<i>Dependent variable:</i>		
	Choice ATR	Choice MTR	Choice STR
	(1)	(2)	(3)
Employees	0.030 (0.071)	0.082 (0.086)	-0.155** (0.077)
Loss	0.218 (0.272)	-0.776 (0.473)	0.025 (0.290)
Corporation	0.060 (0.262)	-0.484 (0.378)	0.303 (0.277)
Business Decisions	0.037 (0.101)	-0.025 (0.137)	-0.079 (0.105)
Tax Knowledge	-0.460* (0.250)	0.875* (0.466)	0.102 (0.267)
Tax Complexity	0.292* (0.175)	0.259 (0.237)	-0.465*** (0.165)
Female	-0.235 (0.278)	0.158 (0.361)	0.077 (0.284)
Manager	-0.320 (0.678)	0.573 (1.112)	0.283 (0.731)
Tax Assistance	0.472 (0.414)	-0.784* (0.425)	0.221 (0.428)
Misperception Index	-0.007 (0.109)	-0.605*** (0.154)	0.293** (0.117)
Constant	-1.825 (1.181)	-2.482 (1.708)	0.845 (1.172)
Observations	416	416	416
Log Likelihood	-271.498	-166.561	-250.261
Akaike Inf. Crit.	564.996	355.122	522.522

Notes: This table shows logit regression results of *Choice ATR*, *Choice MTR* and *Choice STR*. All variables are defined in more detail in the Appendix A2. Standard errors are in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$.

Table 9: Chosen Tax Rate vs. Actual MTR

	Beneath corridor N = 63	Within corridor N = 123	Above corridor N = 53
Choice ATR (39.1%)	31.4%	44.4%	24.3%
Choice MTR (16.2%)	14.3%	68.6%	17.1%
	26.4%	51.5%	22.2%

Notes: This table describes the firms' reported tax rate considered in investment decisions and compares it to the actual MTR of the firm. Within the corridor is defined as a deviation of less than $\pm 5pp$ of the *reported tax rate* from the firms' actual MTR. If the deviation is larger we classify the *reported tax rate* as beneath or above the corridor of the actual MTR.

Appendix

A1 Full Survey Questionnaire

The survey structure is explained in Section 2. The survey has seven parts.

Part I: Firm Characteristics

1. What is the legal form of your firm?
- 2a. In which craft do you operate?
- 2b. In which industry do you work?
- 3a. Which chamber of handicrafts are you a member of?
- 3b. In which federal state is your firm registered?
4. Does your firm belong to a group?
- 5a. How many people, that are subject to social insurance contributions, do you employ? Please state the exact number.
- 5b. Which interval does most likely correspond to the number of people you employ that are subject to social insurance contributions?
6. Does your firm belong to a tax group?
7. Which of the following intervals most accurately corresponds to your sales (in euros) in the 2019 financial year?
- 8a. Can you specify the number of shareholders involved in your firm?
- 8b. Which of the following intervals most closely matches the number of shareholders involved in your firm?
- 9a. Does your firm use the support of a tax advisor?
- 9b. Does your firm have its own tax department?

Part II: Income Taxation

1. How high do you estimate the income tax burden (in %) if your firm were to achieve a domestic annual result before taxes in the amount of [profit] €?
2. Assume that your firm can increase this annual profit before tax by [10% profit] € (10%). How high do you estimate the income tax burden (in %) on this additional [10% profit] €?
3. What income tax burden (in %) do you feel would be appropriate if your firm were to achieve domestic annual earnings before taxes in the amount of [profit] €?

Part III: Comparison of Income Taxation

1. How would you rate your firm's income tax burden compared to a smaller/bigger/firm of different legal form?
2. How would you rate your firm's income tax burden compared to foreign competitors?

Part IV: Taxes in Business Decisions

1. Do you consider income taxes in investment/financing decisions?
2. Do you seek professional advice on tax aspects (e.g., from a tax advisor) when making investment/financing decisions?
3. Which tax rate do you use to make these business decisions?

Part V: Compliance Costs

1. Please estimate the share of the tax-related administrative burden in the total tax-related administrative expenses in your firm.

Part VI: Tax System

1. To what extent do you agree with the following statement? "German corporate taxation is too complex".
2. To what extent do you agree with the following statement? "The state handles the taxes it collects responsibly".

Part VII: Firm & personal Characteristics

1. Has your [firm/group] generated profits in the financial year 2018/2019/2020?
2. Do you expect your [firm/group] to make a profit in the 2021 financial year?
3. What is the (weighted) local tax factor of your firm?
4. Please state your gender.
5. Do you have any tax knowledge?
6. Do you work in an executive position?

A2 Variables

Variable Definition

Table 10: Variable Definition

Name	Definition	Values
Firm Characteristics		
<i>Employees</i>	= Natural logarithm of the exact number/the average value of the range selected	metric
<i>Corporation</i>	= 1, if legal form is corporation, 0 otherwise	binary
<i>Loss</i>	= 1, if loss occurred in 2019 or 2020, 0 otherwise	binary
<i>Tax Assistance</i>	= 1, if firm gets support from tax advisor, 0 otherwise	binary
Personal Characteristics		
<i>Tax Knowledge Index</i>	= Standardized index comprising indicator variables:	metric
<i>Tax Knowledge</i>	= 1, if respondent has tax knowledge, 0 otherwise	binary
<i>Tax Schedule</i>	= 1, if relation ATR to MTR accurate, 0 otherwise	binary
<i>Tax Rate Choice</i>	= 1, if using MTR in business decisions, 0 otherwise	binary
<i>Business Decisions</i>	= Frequency of using taxes in business decisions	metric
<i>Tax Satisfaction Index</i>	= Standardized index comprising indicator variables:	metric
<i>Tax Cut</i>	= Proposed tax cut	metric
<i>Tax Complexity</i>	= Perceived tax complexity	metric
<i>Trust in Government</i>	= Stated trust in government	metric
<i>Tax Compliance Cost</i>	= Estimated tax compliance costs	metric
<i>Peers' Tax Burden</i>	= Perception of peers' tax burden	metric
<i>Female</i>	= 1, if stated gender is female, 0 otherwise	binary
<i>Manager</i>	= 1, if respondent works in an executive position, 0 otherwise	binary
Misperception Characteristics		
<i>Misperception Index</i>	= Standardized index comprising indicator variables:	metric
<i>ATR Misperception</i>	= 1, if respondent misperceive ATR_{retained} by $> 5\text{pp}$, 0 otherwise	binary
<i>MTR Misperception</i>	= 1, if respondent misperceive MTR_{retained} by $> 5\text{pp}$, 0 otherwise	binary
<i>Tax Schedule Misperception</i>	= 1, if relation ATR to MTR misperceived, 0 otherwise	binary

Notes: This table presents definitions of drivers analyzed in our regression analysis.

Summary Statistics

Table 11: Summary Statistics

Statistic	N	Mean	St. Dev.	Min	Median	Max
ATR _{retained} Misp.	478	0.113	0.103	0.000	0.093	0.647
ATR _{distributed} Misp.	478	0.126	0.105	0.000	0.111	0.647
MTR _{retained} Misp.	478	0.102	0.108	0.00005	0.057	0.515
MTR _{distributed} Misp.	478	0.113	0.113	0.0002	0.071	0.515
Employees	478	1.992	1.730	0.000	1.792	11.918
Corporation	478	0.264	0.441	0	0	1
Loss	478	0.184	0.388	0	0	1
Tax Assistance	478	0.906	0.292	0	1	1
Tax Knowledge Index	478	0.000	1.000	-2.381	-0.046	2.274
Tax Knowledge	478	0.000	1.000	-1.849	0.540	0.540
Tax Schedule	478	0.000	1.000	-1.138	0.877	0.877
Tax Rate Choice	478	0.000	1.000	-0.407	-0.407	2.453
Business Decisions	478	0.000	1.000	-1.865	0.400	1.154
Tax Satisfaction Index	478	0.000	1.000	-5.798	0.001	2.847
Tax Cut _{retained}	478	0.000	1.000	-9.510	0.251	2.188
Tax Cut _{distributed}	478	0.000	1.000	-9.509	0.156	6.062
Tax Complexity	478	0.000	1.000	-0.497	-0.497	5.441
Trust	478	0.000	1.000	-0.882	0.216	3.511
Tax Compliance Cost	478	0.000	1.000	-3.208	0.145	1.583
Peers' Tax Burden	478	0.000	1.000	-2.129	-0.178	1.774
Female	478	0.180	0.385	0	0	1
Manager	478	0.977	0.150	0	1	1
Misperception Index	478	1.623	1.003	0	2	3
ATR _{retained} Misperception	478	0.644	0.479	0	1	1
MTR _{retained} Misperception	478	0.544	0.499	0	1	1
Tax Schedule Misperception	478	0.435	0.496	0	0	1

Notes: This table presents summary statistics of our regression variables incl. standardized variables (z-score) incorporated in Tax Knowledge and Tax Satisfaction Index.

A3 Propensity Score Matching

In order to account for tax base effects, we match survey respondents with 10 observations from the official income tax statistics (FAST 2014, see Section 3.2). We are interested in *Additional Income* and *Special Expenses* of comparable entrepreneurs. For this reason, we limit FAST 2014 to a weighted sample of 2,438,306 entrepreneurs, which forms the basis for matching.

After propensity score matching we can check the balance of our covariates in Table 12.

Table 12: Summary of Balance for Matched Data

	FAST 2014 N = 7,442	Survey N = 748
Profit		
Mean (SD)	87,200 (91,200)	90,300 (103,000)
Median [Min, Max]	60,100 [16,900; 10,300,000]	62,600 [17,800; 10,400,000]
Industry		
BC	1,741 (23.4%)	176 (23.5%)
DE	20 (0.3%)	2 (0.3%)
F	3,382 (45.4%)	340 (45.5%)
G	800 (10.7%)	80 (10.7%)
I	20 (0.3%)	2 (0.3%)
J	20 (0.3%)	2 (0.3%)
K	40 (0.5%)	4 (0.5%)
L	40 (0.5%)	4 (0.5%)
M	160 (2.2%)	26 (2.1%)
N	20 (0.3%)	2 (0.3%)
Q	20 (0.3%)	2 (0.3%)
S	1,179 (15.8%)	118 (15.8%)
Legal		
Sole Proprietorship	5,400 (72.6%)	540 (72.2%)
Partnership	2,042 (27.4%)	208 (27.8%)
Married		
Single	3,711 (49.9%)	374 (50.0%)
Married	3,731 (50.1%)	374 (50.0%)

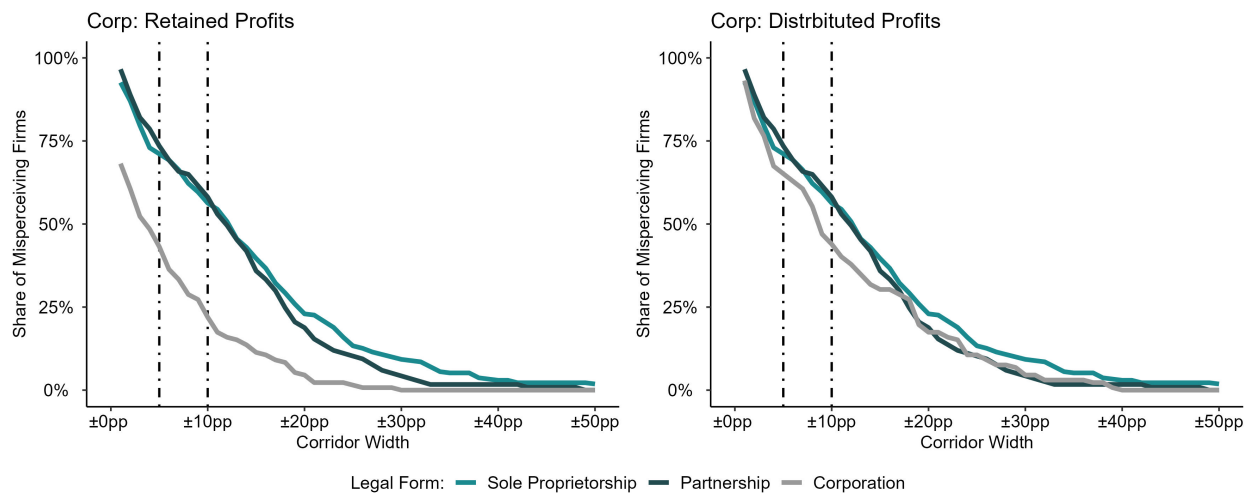
Notes: This table shows matched data of FAST 2014 and Survey observations. Industry is the 'Gewerbekennzahl' given in the official income tax statistics and can be derived from the industry asked in our Survey. The number of observations (N = 748) represents twice of our matchable sole proprietorships and partnerships because we used them as both single and married taxpayers to account for the unknown marital status.

A4 Additional Analysis

A4.1 Corridor Sensitivity

In Section 4.1 we define firms as misperceiving if they exceed the selected corridor of ± 5 or ± 10 pp. We chose ± 5 (± 10)pp corridors because these result into quite large deviations of more than 15% (30%) given average tax rates of 30%. To be transparent we show in Figure 10 how the chosen corridor affects the share of firms misperceiving their tax burden.

Figure 10: Corridor Sensitivity



Notes: This figure shows the average share of ATR misperceiving firms on defined corridors by legal form. Corporations in case of retained profits. The dot-dashed lines indicate the corridors used within the paper.

A4.2 Correlation of Covariates

Table 13: Correlation Matrix of Covariates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Employees	1	0.410	0.012	-0.284	0.131	0.094	-0.085	0.012
(2) Corporation	0.410	1	0.059	-0.051	0.027	0.142	-0.095	0.028
(3) Loss	0.012	0.059	1	-0.050	-0.042	-0.119	0.002	0.001
(4) Tax Assistance	-0.284	-0.051	-0.050	1	-0.122	-0.068	0.002	0.046
(5) Tax Satisfaction Index	0.131	0.027	-0.042	-0.122	1	-0.038	0.006	-0.031
(6) Tax Knowledge Index	0.094	0.142	-0.119	-0.068	-0.038	1	0.075	-0.019
(7) Female	-0.085	-0.095	0.002	0.002	0.006	0.075	1	-0.182
(8) Manager	0.012	0.028	0.001	0.046	-0.031	-0.019	-0.182	1

Notes: This table presents a correlation matrix of variables used in the regression analyses. The variance inflation factor does not indicate any problems regarding multicollinearity.

A4.3 Summary Statistics by Legal Form

We additionally provide summary statistics of variables used in our regressions for sole proprietorships and partnerships as well as for corporations.

Table 14: Summary Statistics (Sole Proprietorships and Partnerships)

Statistic	N	Mean	St. Dev.	Min	Median	Max
ATR _{retained} Misp.	352	0.132	0.107	0.000	0.121	0.647
ATR _{distributed} Misp.	352	0.132	0.107	0.000	0.121	0.647
MTR _{retained} Misp.	352	0.109	0.112	0.0002	0.064	0.515
MTR _{distributed} Misp.	352	0.109	0.112	0.0002	0.064	0.515
Employees	352	1.568	1.526	0.000	1.386	10.597
Corporation	352	0.000	0.000	0	0	0
Loss	352	0.170	0.377	0	0	1
Tax Assistance	352	0.915	0.280	0	1	1
Tax Satisfaction Index	352	-0.016	0.994	-5.619	-0.012	2.847
Tax Knowledge Index	352	-0.085	1.018	-2.381	-0.102	2.274
Female	352	0.202	0.402	0	0	1
Manager	352	0.974	0.158	0	1	1
Misperception Index	352	1.793	0.864	0	2	3

Notes: This table presents summary statistics of our variables used in the regression analyses. The number of observations differs to the presented final sample due to missing answers of covariates.

Table 15: Summary Statistics (Corporations)

Statistic	N	Mean	St. Dev.	Min	Median	Max
ATR _{retained} Misp.	126	0.059	0.065	0.00005	0.037	0.295
ATR _{distributed} Misp.	126	0.111	0.097	0.001	0.083	0.393
MTR _{retained} Misp.	126	0.080	0.090	0.00005	0.045	0.502
MTR _{distributed} Misp.	126	0.123	0.114	0.003	0.097	0.463
Employees	126	3.176	1.721	0.693	2.890	11.918
Corporation	126	1.000	0.000	1	1	1
Loss	126	0.222	0.417	0	0	1
Tax Assistance	126	0.881	0.325	0	1	1
Tax Satisfaction Index	126	0.045	1.019	-5.798	0.052	2.468
Tax Knowledge Index	126	0.237	0.910	-1.697	0.296	2.274
Female	126	0.119	0.325	0	0	1
Manager	126	0.984	0.125	0	1	1
Misperception Index	126	1.151	1.200	0	1	3

Notes: This table presents summary statistics of our variables used in the regression analyses. The number of observations differs to the presented final sample due to missing answers of covariates.

A5 Robustness Checks

The identification of firms' tax rate misperception is based on assumptions. We want to ensure that these assumptions do not erroneously inflate or deflate our baseline results. For this purpose, we check following different approaches and methods:

1. Samples
2. Identification of Tax Misperception
3. Method

A5.1 Samples

Subsample: Ex. Implausible MTRs

Comparing ATRs and MTRs, we find firms that report single digit MTRs although they report double digit ATRs. It may be that these firms did not understand the question about the marginal tax rate. Therefore, we perform additional analyses for subsamples excluding these “implausible MTR” firms. The regression results remain similar.

Table 16: OLS Regression of ATR and MTR Misperception

	<i>Dependent variable:</i>			
	ATR _{retained}	MTR _{retained}	ATR _{distributed}	MTR _{distributed}
	(1)	(2)	(3)	(4)
Employees	-0.005 (0.005)	0.005 (0.004)	-0.005 (0.005)	0.005 (0.004)
Corporation	-0.067*** (0.022)	0.029 (0.022)	-0.042 (0.028)	0.034 (0.026)
Employees x Corporation	0.002 (0.008)	-0.015* (0.008)	0.010 (0.010)	-0.003 (0.009)
Loss	0.013 (0.014)	0.011 (0.012)	0.007 (0.015)	0.001 (0.013)
Tax Assistance	0.004 (0.015)	-0.007 (0.013)	0.0002 (0.018)	-0.006 (0.014)
Tax Knowledge Index	-0.015*** (0.004)	-0.018*** (0.004)	-0.019*** (0.004)	-0.021*** (0.004)
Tax Satisfaction Index	-0.030*** (0.007)	-0.014** (0.005)	-0.028*** (0.007)	-0.009* (0.005)
Female	-0.009 (0.011)	-0.012 (0.010)	-0.002 (0.012)	-0.005 (0.011)
Manager	0.005 (0.018)	0.022 (0.025)	-0.018 (0.032)	0.002 (0.038)
Constant	0.133*** (0.022)	0.068** (0.027)	0.158*** (0.034)	0.087** (0.038)
Observations	445	445	445	445
R ²	0.218	0.087	0.113	0.070
Adjusted R ²	0.202	0.068	0.095	0.051

Notes: This table shows the OLS regression results of ATR and MTR misperception. The dependent variables in columns (1) and (2) represent the case where corporations report their ATR and MTR on retained profits, and the dependent variables in columns (3) and (4) represent the case where corporations report their ATR and MTR on distributed profits. All variables are defined in more detail in the Appendix A2. Robust standard errors are in parentheses. * p < .1, ** p < .05, *** p < .01.

Table 17: OLS Regression of ATR and MTR Over-/Underestimation

	<i>Dependent variable:</i>							
	ATR _{retained}		MTR _{retained}		ATR _{distributed}		MTR _{distributed}	
	Over	Under	Over	Under	Over	Under	Over	Under
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Employees	-0.018*** (0.004)	0.020*** (0.007)	-0.013*** (0.005)	0.012** (0.005)	-0.018*** (0.004)	0.020*** (0.007)	-0.013*** (0.005)	0.013** (0.005)
Corporation	-0.096*** (0.020)	0.052* (0.029)	0.034 (0.022)	-0.011 (0.027)	-0.100*** (0.031)	0.105*** (0.033)	0.013 (0.033)	0.047 (0.030)
Employees x Corporation	0.013** (0.006)	-0.022** (0.010)	-0.002 (0.007)	-0.011 (0.009)	0.021** (0.008)	-0.016 (0.011)	0.008 (0.008)	-0.007 (0.010)
Loss	0.034** (0.016)	0.009 (0.014)	0.030* (0.017)	-0.017 (0.016)	0.026 (0.018)	-0.001 (0.018)	0.008 (0.019)	-0.020 (0.016)
Tax Assistance	0.032** (0.013)	-0.011 (0.021)	0.012 (0.015)	-0.010 (0.016)	0.023 (0.014)	0.001 (0.030)	0.0004 (0.017)	0.007 (0.017)
Tax Knowledge Index	-0.010** (0.004)	-0.018*** (0.006)	-0.004 (0.004)	-0.029*** (0.006)	-0.012** (0.005)	-0.023*** (0.009)	-0.002 (0.005)	-0.033*** (0.006)
Tax Satisfaction Index	-0.040*** (0.008)	0.013* (0.007)	-0.032*** (0.006)	0.002 (0.007)	-0.046*** (0.007)	0.017** (0.008)	-0.032*** (0.007)	0.005 (0.007)
Female	-0.018 (0.013)	0.030* (0.018)	-0.021* (0.012)	0.004 (0.016)	-0.013 (0.013)	0.022 (0.022)	-0.010 (0.012)	0.001 (0.017)
Manager	0.016 (0.015)	-0.042** (0.021)	0.010 (0.024)	0.029 (0.033)	0.006 (0.019)	-0.202*** (0.029)	-0.008 (0.043)	0.002 (0.051)
Constant	0.121*** (0.019)	0.052 (0.037)	0.070** (0.029)	0.060* (0.035)	0.139*** (0.024)	0.202*** (0.052)	0.101** (0.046)	0.069 (0.050)
Observations	351	94	244	201	320	125	218	227
R ²	0.330	0.368	0.217	0.175	0.285	0.315	0.160	0.161
Adjusted R ²	0.313	0.300	0.186	0.136	0.264	0.261	0.124	0.126

Notes: This table shows OLS regression results of ATR and MTR misperception, which is divided into overestimation and underestimation. The dependent variables in columns (1)-(4) represent the case where corporations report their ATR and MTR on retained profits, and the dependent variables in columns (5)-(8) represent the case where corporations report their ATR and MTR on distributed profits. Note, that underestimates like overestimates have a positive sign. All variables are defined in more detail in the Appendix A2. Robust standard errors are in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$.

Subsample: Ex. fast Respondents

In line with Fisman et al. (2020) and Stantcheva (2021), we drop very fast respondents in this additional analysis. We drop respondents in the bottom 5% of the survey time distribution. These respondents may not have taken the survey seriously. The regression results remain similar.

Table 18: OLS Regression of ATR and MTR Misperception

	<i>Dependent variable:</i>			
	ATR _{retained}	MTR _{retained}	ATR _{distributed}	MTR _{distributed}
	(1)	(2)	(3)	(4)
Employees	-0.005 (0.005)	0.010** (0.004)	-0.005 (0.005)	0.010** (0.004)
Corporation	-0.064*** (0.021)	0.031 (0.022)	-0.044 (0.027)	0.041 (0.029)
Employees x Corporation	0.002 (0.008)	-0.020*** (0.008)	0.011 (0.010)	-0.010 (0.009)
Loss	0.016 (0.013)	0.014 (0.014)	0.011 (0.014)	0.004 (0.015)
Tax Assistance	-0.001 (0.016)	0.002 (0.016)	-0.002 (0.017)	0.001 (0.016)
Tax Knowledge Index	-0.013*** (0.004)	-0.029*** (0.004)	-0.018*** (0.004)	-0.034*** (0.005)
Tax Satisfaction Index	-0.028*** (0.007)	-0.015*** (0.005)	-0.027*** (0.007)	-0.012** (0.005)
Female	-0.012 (0.011)	-0.003 (0.012)	0.0003 (0.012)	0.006 (0.013)
Manager	0.004 (0.017)	0.019 (0.029)	-0.015 (0.030)	0.003 (0.038)
Constant	0.134*** (0.022)	0.069** (0.032)	0.151*** (0.032)	0.085** (0.039)
Observations	454	454	454	454
R ²	0.202	0.128	0.116	0.105
Adjusted R ²	0.186	0.110	0.098	0.087

Notes: This table shows the OLS regression results of ATR and MTR misperception. The dependent variables in columns (1) and (2) represent the case where corporations report their ATR and MTR on retained profits, and the dependent variables in columns (3) and (4) represent the case where corporations report their ATR and MTR on distributed profits. All variables are defined in more detail in the Appendix A2. Robust standard errors are in parentheses. * p < .1, ** p < .05, *** p < .01.

Table 19: OLS Regression of ATR and MTR Over-/Underestimation

	<i>Dependent variable:</i>							
	ATR _{retained}		MTR _{retained}		ATR _{distributed}		MTR _{distributed}	
	Over	Under	Over	Under	Over	Under	Over	Under
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Employees	-0.020*** (0.004)	0.021*** (0.007)	-0.010** (0.004)	0.016*** (0.006)	-0.020*** (0.004)	0.022*** (0.007)	-0.011** (0.004)	0.016*** (0.006)
Corporation	-0.092*** (0.019)	0.051* (0.029)	0.039* (0.022)	-0.016 (0.031)	-0.093*** (0.030)	0.093*** (0.031)	0.022 (0.033)	0.041 (0.035)
Employees x Corporation	0.014** (0.006)	-0.023** (0.010)	-0.003 (0.006)	-0.017 (0.011)	0.021*** (0.008)	-0.016 (0.011)	0.005 (0.008)	-0.013 (0.011)
Loss	0.033** (0.015)	0.016 (0.014)	0.029 (0.017)	-0.009 (0.021)	0.025 (0.017)	0.009 (0.017)	0.005 (0.020)	-0.014 (0.020)
Tax Assistance	0.024* (0.014)	-0.008 (0.021)	0.026 (0.017)	-0.001 (0.023)	0.013 (0.015)	0.019 (0.020)	0.009 (0.018)	0.017 (0.022)
Tax Knowledge Index	-0.008* (0.004)	-0.015** (0.006)	-0.007 (0.004)	-0.043*** (0.007)	-0.011** (0.005)	-0.024*** (0.008)	-0.004 (0.005)	-0.048*** (0.007)
Tax Satisfaction Index	-0.037*** (0.007)	0.013** (0.007)	-0.031*** (0.007)	-0.007 (0.007)	-0.041*** (0.008)	0.013* (0.008)	-0.030*** (0.007)	-0.006 (0.007)
Female	-0.019 (0.013)	0.021 (0.018)	-0.019 (0.012)	0.016 (0.020)	-0.012 (0.013)	0.031 (0.021)	-0.007 (0.013)	0.016 (0.020)
Manager	0.015 (0.014)	-0.055*** (0.021)	0.008 (0.022)	0.020 (0.040)	0.007 (0.019)	-0.203*** (0.028)	-0.009 (0.043)	-0.003 (0.049)
Constant	0.127*** (0.020)	0.062* (0.035)	0.053* (0.028)	0.081* (0.044)	0.143*** (0.024)	0.180*** (0.043)	0.087* (0.046)	0.086* (0.051)
Observations	362	92	232	222	330	124	208	246
R ²	0.305	0.369	0.217	0.198	0.261	0.330	0.152	0.169
Adjusted R ²	0.288	0.300	0.185	0.164	0.241	0.278	0.113	0.137

Notes: This table shows OLS regression results of ATR and MTR misperception, which is divided into overestimation and underestimation. The dependent variables in columns (1)-(4) represent the case where corporations report their ATR and MTR on retained profits, and the dependent variables in columns (5)-(8) represent the case where corporations report their ATR and MTR on distributed profits. Note, that underestimates like overestimates have a positive sign. All variables are defined in more detail in the Appendix A2. Robust standard errors are in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$.

A5.2 Identification of Tax Misperception

Profit as Taxable Income

In this section, we alternatively compute ATR and MTR misperception for the case where *given profit* is used as taxable income. This reflects the idea that respondents do not necessarily consider the impact of *Additional Income* or *Special Expenses* on the tax base (see Section 3.2). Comparing these results to ATR and MTR misperception based taxable income the share of misperception varies only slightly. There is no qualitative variation.

Table 20: ATR MTR Misperception (Profit)

	Sole Proprietorships	Partnerships	Corporations	
	N = 270	N = 117	<i>retained</i>	<i>distributed</i>
Reported ATR	32.7%	36.9%	31.4%	43.3%
Actual ATR	24.1%	32.9%	29.8%	48.3%
ATR Misperception	8.6pp***	4pp***	1.6pp**	-5pp***
Share >5pp (>10pp)	59.6% (40%)	68.4% (47.9%)	43.2% (22%)	65.2% (43.9%)
ATR Overestimation	12.5pp	10.3pp	5.9pp	8.7pp
Share >5pp (>10pp)	55.9% (38.1%)	50.4% (33.3%)	28% (13.6%)	19.7% (11.4%)
ATR Underestimation	-3.8pp	-13.4pp	-5.8pp	-12.8pp
Share >5pp (>10pp)	3.7% (1.9%)	17.9% (14.5%)	15.2% (8.3%)	45.5% (32.6%)
Reported MTR	31.3%	36.6%	31.9%	43.3%
Actual MTR	34.1%	42.1%	29.8%	48.3%
MTR Misperception	-3.7pp***	-5.2pp***	2.1pp**	-5pp***
Share >5pp (>10pp)	56.7% (39.3%)	53% (37.6%)	46.2% (29.5%)	46.2% (49.2%)
MTR Overestimation	9pp	5.7pp	8.2pp	9.4pp
Share >5pp (>10pp)	19.6% (12.2%)	21.4% (9.4%)	31.1% (18.2%)	19.7% (14.4%)
MTR Underestimation	-12.8pp	-15.9pp	-7.5pp	-14.4pp
Share >5pp (>10pp)	37% (27%)	31.6% (28.2%)	15.2% (11.4%)	44.7% (34.8%)

Notes: This table shows descriptive evidence of ATR and MTR Misperception. Reported ATR/MTR is the mean value of reported ATRs by legal form. Actual ATRs/MTRs are calculated benchmark ATRs. ATR/MTR Misperception is calculated as Reported ATR/MTR minus Actual ATR/MTR. ***, **, and * denote significance at the 1%, 5%, and 10% levels of a two-sided t-test (ATR/MTR Misperception = 0). ATR/MTR Overestimation measures the average ATR/MTR Misperception in case of positive deviations, and ATR/MTR Underestimation measures the average ATR/MTR Misperception in case of negative deviations. Share >5pp (>10pp) gives the share of all firms that misperceive, overestimate, or underestimate the Actual ATR/MTR by more than ± 5 pp (± 10 pp).

Table 21: OLS Regression of ATR and MTR Misperception (Profit)

	<i>Dependent variable:</i>			
	ATR _{retained}	MTR _{retained}	ATR _{distributed}	MTR _{distributed}
	(1)	(2)	(3)	(4)
Employees	-0.0001 (0.005)	0.009** (0.004)	-0.0002 (0.005)	0.009** (0.004)
Corporation	-0.028 (0.020)	0.032 (0.022)	0.001 (0.026)	0.048* (0.028)
Employees x Corporation	-0.004 (0.008)	-0.020*** (0.007)	0.004 (0.009)	-0.010 (0.009)
Loss	0.022* (0.012)	0.016 (0.013)	0.015 (0.013)	0.005 (0.014)
Tax Assistance	0.002 (0.014)	0.002 (0.015)	-0.002 (0.017)	0.001 (0.015)
Tax Knowledge Index	-0.011*** (0.004)	-0.028*** (0.004)	-0.016*** (0.004)	-0.032*** (0.005)
Tax Satisfaction Index	-0.021*** (0.006)	-0.013** (0.005)	-0.020*** (0.006)	-0.009* (0.005)
Female	-0.012 (0.010)	-0.007 (0.011)	-0.003 (0.011)	0.001 (0.012)
Manager	0.021 (0.018)	0.008 (0.029)	0.003 (0.031)	-0.008 (0.037)
Constant	0.077*** (0.021)	0.077** (0.031)	0.098*** (0.033)	0.094** (0.039)
Observations	478	478	478	478
R ²	0.139	0.121	0.077	0.102
Adjusted R ²	0.122	0.104	0.059	0.085

Notes: This table shows the OLS regression results of ATR and MTR misperception. The dependent variables in columns (1) and (2) represent the case where corporations report their ATR and MTR on retained profits, and the dependent variables in columns (3) and (4) represent the case where corporations report their ATR and MTR on distributed profits. All variables are defined in more detail in the Appendix A2. Robust standard errors are in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$.

Table 22: OLS Regression of ATR and MTR Over-/Underestimation (Profit)

	<i>Dependent variable:</i>							
	ATR _{retained}		MTR _{retained}		ATR _{distributed}		MTR _{distributed}	
	Over	Under	Over	Under	Over	Under	Over	Under
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Employees	-0.018*** (0.004)	0.021*** (0.006)	-0.010** (0.005)	0.015*** (0.005)	-0.014*** (0.004)	0.021*** (0.006)	-0.010** (0.005)	0.016*** (0.005)
Corporation	-0.063*** (0.018)	0.049** (0.025)	0.048** (0.023)	-0.015 (0.030)	-0.048* (0.029)	0.108*** (0.030)	0.028 (0.033)	0.048 (0.033)
Employees x Corporation	0.012** (0.006)	-0.023** (0.009)	-0.006 (0.007)	-0.017 (0.010)	0.015** (0.008)	-0.018* (0.010)	0.003 (0.008)	-0.013 (0.011)
Loss	0.030** (0.014)	0.012 (0.014)	0.022 (0.016)	0.003 (0.019)	0.029* (0.015)	-0.0002 (0.016)	-0.001 (0.018)	-0.004 (0.018)
Tax Assistance	0.032** (0.014)	-0.017 (0.018)	0.007 (0.015)	0.012 (0.020)	0.020 (0.014)	-0.007 (0.026)	-0.009 (0.015)	0.022 (0.020)
Tax Knowledge Index	-0.004 (0.004)	-0.015*** (0.004)	-0.003 (0.004)	-0.042*** (0.006)	-0.007 (0.004)	-0.022*** (0.006)	-0.001 (0.005)	-0.047*** (0.006)
Tax Satisfaction Index	-0.027*** (0.007)	0.013** (0.006)	-0.030*** (0.006)	-0.005 (0.006)	-0.035*** (0.007)	0.016** (0.007)	-0.031*** (0.007)	-0.004 (0.006)
Female	-0.021* (0.012)	0.014 (0.015)	-0.023** (0.011)	0.018 (0.018)	-0.013 (0.012)	0.019 (0.018)	-0.014 (0.012)	0.016 (0.019)
Manager	0.032** (0.015)	-0.035 (0.025)	-0.010 (0.023)	0.023 (0.038)	0.021 (0.019)	-0.113 (0.071)	-0.036 (0.046)	0.003 (0.045)
Constant	0.072*** (0.020)	0.058* (0.033)	0.086*** (0.031)	0.061 (0.040)	0.081*** (0.023)	0.124 (0.079)	0.128** (0.051)	0.071 (0.045)
Observations	350	128	238	240	347	161	212	266
R ²	0.250	0.370	0.197	0.215	0.219	0.344	0.149	0.185
Adjusted R ²	0.230	0.322	0.166	0.184	0.198	0.305	0.111	0.157

Notes: This table shows OLS regression results of ATR and MTR misperception, which is divided into overestimation and underestimation. The dependent variables in columns (1)-(4) represent the case where corporations report their ATR and MTR on retained profits, and the dependent variables in columns (5)-(8) represent the case where corporations report their ATR and MTR on distributed profits. Note, that underestimates like overestimates have a positive sign. All variables are defined in more detail in the Appendix A2. Robust standard errors are in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$.

Total Income as Taxable Income

In this section, we alternatively compute ATR and MTR misperception for the case where total income is used as taxable income. This reflects the idea that respondents do consider other *Additional Income* but not *Special Expenses* (see Section 3.2). Comparing these results to ATR and MTR misperception based taxable income the share of misperception varies only slightly. There is no qualitative variation.

Table 23: ATR and MTR Misperception (Total Income)

	Sole Proprietorships	Partnerships	Corporations	
	N = 270	N = 117	retained	distributed
Reported ATR	32.7%	36.9%	31.4%	43.3%
Actual ATR	24.7%	33.6%	29.8%	48.3%
ATR Misperception	8.1pp***	3.3pp**	1.6pp**	-5pp***
Share >5pp (>10pp)	63% (41.1%)	64.1% (47.9%)	43.2% (22%)	65.2% (43.9%)
ATR Overestimation	12.5pp	9.4pp	5.9pp	8.7pp
Share >5pp (>10pp)	55.2% (37.8%)	46.2% (30.8%)	28% (13.6%)	19.7% (11.4%)
ATR Underestimation	-4.8pp	-14.4pp	-5.8pp	-12.8pp
Share >5pp (>10pp)	7.8% (3.3%)	17.9% (17.1%)	15.2% (8.3%)	45.5% (32.6%)
Reported MTR	31.3%	36.6%	31.9%	43.3%
Actual MTR	34.1%	42.1%	29.8%	48.3%
MTR Misperception	-5.3pp***	-6.4pp***	2.1pp**	-5pp***
Share >5pp (>10pp)	62.2% (44.1%)	58.1% (38.5%)	46.2% (29.5%)	46.2% (49.2%)
MTR Overestimation	9.4pp	5.5pp	8.2pp	9.4pp
Share >5pp (>10pp)	19.6% (12.2%)	21.4% (8.5%)	31.1% (18.2%)	19.7% (14.4%)
MTR Underestimation	-14.8pp	-16.5pp	-7.5pp	-14.4pp
Share >5pp (>10pp)	42.6% (31.9%)	36.8% (29.9%)	15.2% (11.4%)	44.7% (34.8%)

Notes: This table shows descriptive evidence of ATR and MTR Misperception. Reported ATR/MTR is the mean value of reported ATRs by legal form. Actual ATRs/MTRs are calculated benchmark ATRs. ATR/MTR Misperception is calculated as Reported ATR/MTR minus Actual ATR/MTR. ***, **, and * denote significance at the 1%, 5%, and 10% levels of a two-sided t-test (ATR/MTR Misperception = 0). ATR/MTR Overestimation measures the average ATR/MTR Misperception in case of positive deviations, and ATR/MTR Underestimation measures the average ATR/MTR Misperception in case of negative deviations. Share >5pp (>10pp) gives the share of all firms that misperceive, overestimate, or underestimate the Actual ATR/MTR by more than ± 5 pp (± 10 pp).

Table 24: OLS Regression of ATR and MTR Misperception (Total Income)

	<i>Dependent variable:</i>			
	ATR _{retained}	MTR _{retained}	ATR _{distributed}	MTR _{distributed}
	(1)	(2)	(3)	(4)
Employees	0.0001 (0.005)	0.006 (0.004)	-0.001 (0.005)	0.006 (0.004)
Corporation	-0.027 (0.020)	0.017 (0.022)	-0.008 (0.026)	0.033 (0.028)
Employees x Corporation	-0.004 (0.008)	-0.017** (0.007)	0.004 (0.009)	-0.008 (0.009)
Loss	0.022* (0.012)	0.017 (0.014)	0.021* (0.013)	0.007 (0.014)
Tax Assistance	0.003 (0.014)	-0.005 (0.016)	-0.001 (0.016)	-0.006 (0.016)
Tax Knowledge Index	-0.011*** (0.004)	-0.031*** (0.004)	-0.017*** (0.004)	-0.036*** (0.005)
Tax Satisfaction Index	-0.021*** (0.006)	-0.012** (0.005)	-0.016*** (0.006)	-0.009 (0.005)
Female	-0.012 (0.010)	-0.005 (0.012)	-0.002 (0.011)	0.003 (0.013)
Manager	0.021 (0.018)	0.016 (0.032)	0.013 (0.032)	-0.0003 (0.040)
Constant	0.074*** (0.022)	0.092*** (0.034)	0.096*** (0.034)	0.109*** (0.041)
Observations	478	478	478	478
R ²	0.135	0.132	0.072	0.103
Adjusted R ²	0.118	0.115	0.054	0.086

Notes: This table shows the OLS regression results of ATR and MTR misperception. The dependent variables in columns (1) and (2) represent the case where corporations report their ATR and MTR on retained profits, and the dependent variables in columns (3) and (4) represent the case where corporations report their ATR and MTR on distributed profits. All variables are defined in more detail in the Appendix A2. Robust standard errors are in parentheses. * p < .1, ** p < .05, *** p < .01.

Table 25: OLS Regression of ATR and MTR Over-/Underestimation (Total Income)

	<i>Dependent variable:</i>							
	ATR _{retained}		MTR _{retained}		ATR _{distributed}		MTR _{distributed}	
	Over	Under	Over	Under	Over	Under	Over	Under
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Employees	-0.018*** (0.004)	0.021*** (0.006)	-0.011** (0.005)	0.012** (0.005)	-0.017*** (0.004)	0.015*** (0.005)	-0.011** (0.005)	0.013** (0.005)
Corporation	-0.060*** (0.018)	0.038 (0.025)	0.048** (0.023)	-0.035 (0.029)	-0.065** (0.029)	0.066** (0.029)	0.026 (0.033)	0.029 (0.033)
Employees x Corporation	0.012** (0.006)	-0.022** (0.009)	-0.005 (0.007)	-0.014 (0.010)	0.018** (0.008)	-0.011 (0.010)	0.004 (0.008)	-0.010 (0.011)
Loss	0.033** (0.014)	0.022 (0.015)	0.021 (0.016)	0.014 (0.019)	0.039** (0.017)	0.005 (0.015)	-0.002 (0.018)	0.006 (0.019)
Tax Assistance	0.028* (0.015)	-0.004 (0.019)	0.002 (0.015)	0.004 (0.021)	0.017 (0.016)	0.0001 (0.022)	-0.017 (0.015)	0.015 (0.021)
Tax Knowledge Index	-0.003 (0.004)	-0.021*** (0.005)	-0.006 (0.004)	-0.044*** (0.006)	-0.005 (0.005)	-0.027*** (0.006)	-0.003 (0.005)	-0.048*** (0.007)
Tax Satisfaction Index	-0.030*** (0.007)	0.009 (0.007)	-0.031*** (0.007)	-0.008 (0.007)	-0.031*** (0.007)	0.014** (0.007)	-0.031*** (0.007)	-0.007 (0.006)
Female	-0.023* (0.012)	0.020 (0.017)	-0.025** (0.012)	0.017 (0.019)	-0.016 (0.014)	0.020 (0.017)	-0.015 (0.013)	0.014 (0.019)
Manager	0.031** (0.015)	-0.031 (0.023)	-0.001 (0.021)	0.006 (0.043)	0.034 (0.023)	-0.096 (0.077)	-0.027 (0.039)	-0.018 (0.050)
Constant	0.075*** (0.021)	0.048 (0.034)	0.085*** (0.029)	0.103** (0.045)	0.089*** (0.027)	0.142* (0.082)	0.130*** (0.044)	0.116** (0.051)
Observations	348	130	225	253	287	191	199	279
R ²	0.260	0.342	0.202	0.211	0.229	0.228	0.148	0.169
Adjusted R ²	0.240	0.293	0.168	0.182	0.204	0.190	0.108	0.141

Notes: This table shows OLS regression results of ATR and MTR misperception, which is divided into overestimation and underestimation. The dependent variables in columns (1)-(4) represent the case where corporations report their ATR and MTR on retained profits, and the dependent variables in columns (5)-(8) represent the case where corporations report their ATR and MTR on distributed profits. Note, that underestimates like overestimates have a positive sign. All variables are defined in more detail in the Appendix A2. Robust standard errors are in parentheses. * p < .1, ** p < .05, *** p < .01.

Robust Misperception

In this section, we alternatively compute ATR and MTR misperception based on taxable income. However, we take into account that introducing a *given profit* plus adding average *Additional Income* and *Special Expenses* could lead to errors (see Section 3.2). Therefore, we adjust the reported tax rate by allowing for additional errors of ± 2 pp, that is reported tax rates above the actual tax rate are adjusted by -2pp and reported tax rates under the actual tax rate by +2pp. Comparing these results to ATR and MTR misperception based taxable income the share of misperception varies only slightly. There is no qualitative variation.

Table 26: ATR and MTR Misperception (Robust)

	Sole Proprietorships	Partnerships	Corporations	
	N = 270	N = 117	retained	distributed
Reported ATR	32.7%	36.9%	31.4%	43.3%
Actual ATR	19.7%	30.9%	29.8%	48.3%
ATR Misperception	11.6pp***	5.2pp***	1.2pp*	-4.5pp***
Share >5pp (>10pp)	66.3% (50.7%)	65.8% (49.6%)	33.3% (15.9%)	60.6% (37.9%)
ATR Overestimation	15pp	11.8pp	7pp	9.1pp
Share >5pp (>10pp)	63.3% (49.6%)	50.4% (36.8%)	19.7% (8.3%)	18.2% (7.6%)
ATR Underestimation	-4.2pp	-13pp	-7.8pp	-12.8pp
Share >5pp (>10pp)	3% (1.1%)	15.4% (12.8%)	13.6% (7.6%)	13.6% (30.3%)
Reported MTR	31.3%	36.6%	31.9%	43.3%
Actual MTR	34.1%	42.1%	29.8%	48.3%
MTR Misperception	-2.6pp***	-5.4pp***	1.7pp*	-4.6pp***
Share >5pp (<10pp)	48.1% (35.9%)	46.2% (34.2%)	40.9% (25.8%)	40.9% (42.4%)
MTR Overestimation	9.4pp	6.4pp	9.4pp	11pp
Share >5pp (>10pp)	17.4% (12.2%)	14.5% (6.8%)	25.8% (15.2%)	18.2% (10.6%)
MTR Underestimation	-13.8pp	-17.2pp	-9.9pp	-14.6pp
Share >5pp (>10pp)	30.7% (23.7%)	31.6% (27.4%)	15.2% (10.6%)	15.2% (31.8%)

Notes: This table shows descriptive evidence of ATR and MTR Misperception. Reported ATR/MTR is the mean value of reported ATRs by legal form. Actual ATRs/MTRs are calculated benchmark ATRs. ATR/MTR Misperception is calculated as Reported ATR/MTR minus Actual ATR/MTR. ***, **, and * denote significance at the 1%, 5%, and 10% levels of a two-sided t-test (ATR/MTR Misperception = 0). ATR/MTR Overestimation measures the average ATR/MTR Misperception in case of positive deviations, and ATR/MTR Underestimation measures the average ATR/MTR Misperception in case of negative deviations. Share >5pp (>10pp) gives the share of all firms that misperceive, overestimate, or underestimate the Actual ATR/MTR by more than ± 5 pp (± 10 pp).

Table 27: OLS Regression of ATR and MTR Misperception (Robust)

	<i>Dependent variable:</i>			
	ATR _{retained}	MTR _{retained}	ATR _{distributed}	MTR _{distributed}
	(1)	(2)	(3)	(4)
Employees	-0.007 (0.005)	0.008** (0.004)	-0.007 (0.005)	0.008* (0.004)
Corporation	-0.069*** (0.020)	0.025 (0.021)	-0.040 (0.027)	0.041 (0.028)
Employees x Corporation	0.004 (0.008)	-0.018** (0.007)	0.011 (0.009)	-0.009 (0.009)
Loss	0.014 (0.013)	0.012 (0.014)	0.007 (0.014)	0.001 (0.014)
Tax Assistance	-0.002 (0.016)	-0.0003 (0.015)	-0.006 (0.018)	-0.001 (0.015)
Tax Knowledge Index	-0.011*** (0.004)	-0.027*** (0.004)	-0.016*** (0.004)	-0.031*** (0.005)
Tax Satisfaction Index	-0.028*** (0.006)	-0.014*** (0.005)	-0.026*** (0.006)	-0.011** (0.005)
Female	-0.012 (0.011)	-0.008 (0.012)	-0.002 (0.011)	0.0003 (0.013)
Manager	0.008 (0.017)	0.015 (0.028)	-0.012 (0.030)	-0.002 (0.037)
Constant	0.117*** (0.022)	0.061** (0.030)	0.138*** (0.033)	0.078** (0.038)
Observations	478	478	478	478
R ²	0.198	0.116	0.102	0.096
Adjusted R ²	0.183	0.099	0.085	0.079

Notes: This table shows the OLS regression results of ATR and MTR misperception. The dependent variables in columns (1) and (2) represent the case where corporations report their ATR and MTR on retained profits, and the dependent variables in columns (3) and (4) represent the case where corporations report their ATR and MTR on distributed profits. All variables are defined in more detail in the Appendix A2. Robust standard errors are in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$.

Table 28: OLS Regression of ATR and MTR Over-/Underestimation (Robust)

	<i>Dependent variable:</i>							
	ATR _{retained}		MTR _{retained}		ATR _{distributed}		MTR _{distributed}	
	Over	Under	Over	Under	Over	Under	Over	Under
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Employees	-0.022*** (0.004)	0.019*** (0.007)	-0.010** (0.004)	0.013** (0.006)	-0.022*** (0.004)	0.018** (0.008)	-0.010** (0.004)	0.012** (0.006)
Corporation	-0.097*** (0.017)	0.043 (0.026)	0.033* (0.020)	-0.037 (0.026)	-0.092*** (0.024)	0.090*** (0.031)	0.020 (0.027)	0.016 (0.030)
Employees x Corporation	0.018*** (0.006)	-0.014 (0.009)	-0.003 (0.006)	-0.005 (0.008)	0.021*** (0.007)	-0.008 (0.010)	0.004 (0.007)	0.0003 (0.009)
Loss	0.028* (0.015)	-0.010 (0.015)	0.023 (0.015)	-0.016 (0.022)	0.019 (0.017)	-0.026 (0.016)	0.003 (0.016)	-0.026 (0.020)
Tax Assistance	0.025* (0.013)	-0.005 (0.025)	0.012 (0.013)	0.016 (0.028)	0.023 (0.014)	-0.014 (0.035)	0.012 (0.014)	0.013 (0.025)
Tax Knowledge Index	-0.006 (0.004)	-0.008 (0.008)	-0.003 (0.004)	-0.040*** (0.007)	-0.007* (0.004)	-0.024*** (0.009)	-0.001 (0.004)	-0.052*** (0.008)
Tax Satisfaction Index	-0.034*** (0.007)	0.014 (0.011)	-0.030*** (0.006)	-0.006 (0.007)	-0.038*** (0.007)	0.019** (0.010)	-0.030*** (0.006)	-0.005 (0.006)
Female	-0.014 (0.012)	0.013 (0.020)	-0.016* (0.009)	-0.001 (0.023)	-0.009 (0.012)	0.018 (0.023)	-0.011 (0.010)	-0.002 (0.022)
Manager	0.015 (0.014)	-0.024 (0.025)	0.011 (0.015)	-0.046 (0.040)	0.005 (0.019)	-0.173*** (0.030)	-0.004 (0.028)	-0.091** (0.045)
Constant	0.106*** (0.019)	0.038 (0.044)	0.040** (0.020)	0.140*** (0.052)	0.118*** (0.023)	0.192*** (0.062)	0.056* (0.030)	0.186*** (0.053)
Observations	414	64	295	183	373	105	261	217
R ²	0.308	0.379	0.193	0.151	0.265	0.386	0.154	0.187
Adjusted R ²	0.293	0.275	0.168	0.107	0.247	0.327	0.123	0.151

Notes: This table shows OLS regression results of ATR and MTR misperception, which is divided into overestimation and underestimation. The dependent variables in columns (1)-(4) represent the case where corporations report their ATR and MTR on retained profits, and the dependent variables in columns (5)-(8) represent the case where corporations report their ATR and MTR on distributed profits. Note, that underestimates like overestimates have a positive sign. All variables are defined in more detail in the Appendix A2. Robust standard errors are in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$.

A5.3 Method

To account for close to zero values of overall ATR and MTR misperception, we additionally run Tobit regressions. Regression results can be found in Table 29.

Table 29: Tobit Regression of ATR and MTR Misperception

	<i>Dependent variable:</i>			
	ATR _{retained}	MTR _{retained}	ATR _{distributed}	MTR _{distributed}
	(1)	(2)	(3)	(4)
Employees	-0.006 (0.005)	0.008** (0.004)	-0.006 (0.005)	0.008* (0.004)
Corporation	-0.069*** (0.021)	0.026 (0.022)	-0.039 (0.027)	0.042 (0.028)
Employees x Corporation	0.003 (0.008)	-0.019** (0.007)	0.011 (0.009)	-0.009 (0.009)
Loss	0.014 (0.013)	0.012 (0.014)	0.007 (0.014)	0.001 (0.014)
Tax Assistance	-0.001 (0.016)	0.001 (0.015)	-0.006 (0.018)	0.00001 (0.016)
Tax Knowledge Index	-0.011*** (0.004)	-0.028*** (0.004)	-0.016*** (0.004)	-0.032*** (0.005)
Tax Satisfaction Index	-0.028*** (0.006)	-0.015*** (0.005)	-0.026*** (0.006)	-0.011** (0.005)
Female	-0.011 (0.011)	-0.007 (0.012)	-0.001 (0.011)	0.001 (0.013)
Manager	0.006 (0.017)	0.018 (0.029)	-0.013 (0.030)	0.002 (0.037)
Constant	0.136*** (0.022)	0.074** (0.031)	0.157*** (0.033)	0.091** (0.039)
Observations	478	478	478	478
Log Likelihood	454.532	417.822	417.867	389.226
Wald Test (df = 9)	108.237***	76.286***	37.950***	62.560***

Notes: This table shows the Tobit regression results of ATR and MTR misperception. The dependent variables in columns (1) and (2) represent the case where corporations report their ATR and MTR on retained profits, and the dependent variables in columns (3) and (4) represent the case where corporations report their ATR and MTR on distributed profits. All variables are defined in more detail in the Appendix A2. Robust standard errors are in parentheses. * p < .1, ** p < .05, *** p < .01.

Alternatively, we perform multinomial logistic regression where the dependent variable is the category of misperception: *Underestimation*, *Accurate Estimation*, and *Overestimation*. *Accurate Estimation* equals one for firms that estimate their tax rates within ± 5 pp corridor around their *actual tax rates*. With this method, we can no longer account for the extent of the misperception, but we have a robust estimate of whether a firm is more likely to be an overestimator, an accurate estimator, or an underestimator.

Table 30: Multinomial Regression of ATR and MTR Misperception

	<i>Dependent variable:</i>							
	ATR _{retained} Over	ATR _{retained} Under	MTR _{retained} Over	MTR _{retained} Under	ATR _{distributed} Over	ATR _{distributed} Under	MTR _{distributed} Over	MTR _{distributed} Under
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Employees	-0.297*** (0.104)	0.595*** (0.155)	-0.350*** (0.129)	0.139 (0.086)	-0.296*** (0.105)	0.604*** (0.157)	-0.348*** (0.129)	0.135 (0.087)
Corporation	-0.982* (0.581)	2.528*** (0.760)	0.512 (0.549)	0.116 (0.617)	-2.584*** (0.597)	2.088*** (0.751)	-0.979* (0.565)	-0.585 (0.603)
Employees x Corporation	-0.095 (0.210)	-0.747*** (0.219)	0.068 (0.207)	-0.388** (0.194)	0.301 (0.196)	-0.660*** (0.215)	0.365* (0.202)	-0.270 (0.189)
Loss	-0.251 (0.296)	0.514 (0.441)	0.181 (0.315)	0.238 (0.304)	-0.573* (0.305)	0.450 (0.438)	-0.168 (0.328)	0.073 (0.302)
Tax Assistance	0.860* (0.450)	0.436 (0.663)	0.570 (0.515)	-0.259 (0.415)	0.481 (0.448)	0.379 (0.682)	0.277 (0.493)	-0.356 (0.422)
Tax Knowledge Index	-0.082 (0.114)	-0.577*** (0.213)	-0.115 (0.126)	-0.683*** (0.127)	-0.198* (0.117)	-0.637*** (0.217)	-0.188 (0.129)	-0.733*** (0.129)
Tax Satisfaction Index	-0.675*** (0.131)	0.477** (0.231)	-0.555*** (0.133)	0.026 (0.128)	-0.827*** (0.140)	0.486** (0.236)	-0.533*** (0.133)	0.060 (0.129)
Female	-0.161 (0.290)	0.617 (0.505)	-0.073 (0.330)	0.306 (0.299)	0.058 (0.301)	0.780 (0.507)	0.111 (0.329)	0.322 (0.303)
Manager	-13.306*** (0.741)	-12.077*** (0.728)	0.391 (0.845)	0.985 (0.841)	-14.907*** (0.750)	-13.503*** (0.733)	0.379 (0.835)	0.944 (0.844)
Constant	13.872*** (0.800)	7.975*** (0.995)	-1.141 (0.963)	-1.406 (0.942)	15.850*** (0.814)	9.367*** (1.020)	-0.832 (0.943)	-1.253 (0.946)
Akaike Inf. Crit.	714.069	714.069	950.672	950.672	688.809	688.809	931.387	931.387

Notes: This table shows the multinomial logistic regression results of ATR and MTR misperception. The dependent variable in columns (1)-(4) represent the case where corporations report their ATR/MTR on retained profits, and the dependent variables in columns (5)-(8) represent the case where corporations report their ATR/MTR on distributed profits. All variables are defined in more detail in the Appendix A2. Robust standard errors are in parentheses. * p < .1, ** p < .05, *** p < .01.

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