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## Tax Misperceptions and Labor Supply: A Randomized Information Experiment

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# Tax Misperceptions and Labor Supply: A Randomized Information Experiment\*

## Abstract

In countries with a complex tax system, it is difficult for people to correctly assess their effective marginal tax rate, which in turn can have important consequences for labor supply. We conduct a two-wave randomized survey experiment among a representative sample of the Dutch working-age population (N~2,000) to assess what misperceptions people have and whether addressing those misperceptions via an information intervention affects their labor supply. Our data show that people with low income greatly overestimate their marginal tax rate, while people with high income tend to slightly underestimate it. The information intervention results in more accurate perceptions of the effective marginal tax rate two months after treatment. Work hours of those who initially overestimated their marginal tax rate increase by 1.5 hours per week as a result of the information treatment. The implied compensated wage elasticity of labor supply is +0.3. The effect is concentrated among those who indicate in the first wave that they face no restrictions to increase their work hours. The information intervention reduces income inequality.

## JEL classification

C83, C93, H24, J22

## Keywords

marginal tax rate, labor supply, information experiment, income inequality

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# 1 Introduction

Tax systems have become increasingly complex in the past decades in many countries (OECD (2010), Benzarti and Wallossek (2024)). In addition to progressive tax rates, tax systems nowadays commonly feature a wide range of tax credits, tax deductions, and tax allowances, sometimes with each of these depending in different ways on taxpayer’s gross income and other taxpayer’s characteristics (such as household composition, childcare expenditures, home ownership, rental costs, and medical expenditures). Typically, these provisions are introduced so as to target income redistribution towards groups that are most in need. In other cases, special provisions arise from the desire to preserve or strengthen incentives to work, such as an earned-income tax credit (EITC). Whereas each provision in isolation may give rise to only limited complexity, the multitude of provisions can make tax systems very complicated, making it hard for people to assess their effective marginal tax rate. The resulting misperceptions about the effective marginal tax rate can, in turn, lead people to make suboptimal labor-supply decisions, particularly regarding work hours and job choice.

This paper studies these issues in a country with a highly complicated tax system: The Netherlands. We ran a two-wave randomized survey experiment among a large representative sample of the Dutch working-age population ( $N \sim 2,000$ ). In the first wave, we collect data about people’s beliefs about their effective marginal tax rate, their labor supply, and a number of background characteristics. Moreover, in the first wave we expose a random subset of respondents to coarse information about their actual effective marginal tax rate. In the second wave, two months later, we again collect data on people’s beliefs about their effective marginal tax rate and about their labor supply.

Our key results are as follows. First, we find substantial misperceptions about effective marginal tax rates. In line with earlier studies for other countries (Wagstaff (1965), Blaufus et al. (2015), Gideon (2017), Stantcheva (2021)), low-income people substantially overestimate their marginal tax rate, whereas high-income people underestimate it, albeit slightly.<sup>1</sup>

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<sup>1</sup>Misperceptions of marginal income tax rates have also been documented in Gensemer et al. (1965), Rosen

Second, our information intervention substantially changes beliefs and behaviors measured two months later. The accuracy of beliefs improves, particularly among those who overestimated their effective marginal tax rate in the first wave. In line with our predictions, this group of overestimators also works substantially more hours per week as compared to overestimators in the control group. The estimated effect is about one-and-a-half more work hours per week, which is equivalent to an 8% increase. The implied compensated wage elasticity of labor supply is +0.3, which is comparable to what is commonly found in the empirical literature (Blundell and Macurdy, 1999; Keane, 2011). For people who initially underestimated their effective marginal tax rate, we find a weaker opposite effect (i.e. reduced work hours), which is not statistically significant. Since overestimators are strongly overrepresented among low-income people and underestimators are strongly overrepresented among high-income earners, our information intervention did not only remove biases in individual labor supply, but also reduced income inequality.

Our study builds on a small number of natural and field experiments about the effects of information provision and knowledge about taxes on labor supply. In a seminal contribution, Chetty and Saez (2013) report the results of a field experiment in the US where a random half of 43,000 EITC recipients received face-to-face information about the workings of the EITC, finding no treatment effect on labor supply on average. In the same context, Bhargava and Manoli (2015) find that limited awareness and understanding of the tax code leads to substantial non-take-up of EITC benefits. Using variation in EITC knowledge across neighborhoods, Chetty et al. (2013) find that greater local knowledge of the EITC schedule is associated with sharper bunching at the income level that maximizes the credit, suggesting that better understanding of the tax-benefit schedule can shift labor supply. Liebman and Luttmer (2015) show that a light-touch information intervention explaining social security features to older workers increases their labor force participation one year later. More re-

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(1976), Fujii and Hawley (1988), Rupert and Fischer (1995), Gemmell et al. (2004), Slemrod (2006), Feldman et al. (2016), Sullivan (2026), and Gelber et al. (2025). Blaufus et al. (2022) provides a comprehensive literature review.

cently, in a natural experiment in Norway, Kostøl and Myhre (2021) find that a letter sent by the tax authorities providing information about a kink in the tax-benefit schedule affects people’s earnings and hours.<sup>2</sup>

Our contribution to the literature is twofold. First, our experiment is unique in that we have rich survey data on individual characteristics that naturally determine the direction and size of our treatment effects. In particular, we have data on people’s prior beliefs about their effective marginal tax rate and we know whether they face any constraints regarding their work hours. Our results show that, indeed, treatment effects of the information intervention strongly depend (both in size and direction) on people’s prior beliefs and constraints. A second unique feature of our study is that we consider a representative sample of the working age population rather than a special group. This feature makes that we can speak to the important issue of how information provision affects income inequality.

Our findings have important policy implications. First, tax misperceptions are greatest at the bottom of the income distribution, resulting in lower work hours and hence lower income than is individually optimal, thus exacerbating existing income inequalities. Our results suggest that simple information interventions can improve both efficiency and equality. Second, the prevalence of marginal tax rate misperceptions suggests that tax and welfare policies aimed at stimulating labor supply are likely limited in their effectiveness when implemented within the context of a complex system, whose incentive structure and workings are not easily comprehended by citizens. In line with this, Bosch et al. (2019) do not find the expected bunching of wealth and household income at kinks and notches in the cash transfer system in the Netherlands.

The remainder of the paper is structured as follows. In the next section we briefly describe the context of our study. Next in section 3 we describe our experimental set-up and the hypotheses. Section 4 describes our key hypotheses and Section 5 provides the results.

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<sup>2</sup>There is also a series of lab-experimental studies about the effect of tax misperceptions and information provision on labor supply, see among others: de Bartolome (1995), Rupert and Wright (1998), Rupert et al. (2003), Fochmann and Weimann (2013), Hayashi et al. (2013), and Abeler and Jäger (2015).

Section 6 concludes.

## 2 Context

The Netherlands is well-positioned for our experiment for two reasons. First, it has a notoriously complex tax-and-transfer system. Second, workers have a fair degree of agency in choosing their work hours. This section briefly describes these two contextual features.

### 2.1 The Dutch tax-and-transfer system

The Dutch tax-and-transfer system features, in addition to a progressive income tax, a wide variety of income-dependent tax credits and means-tested allowances. Figure 1 illustrates this for the case of a single household in 2024 with two children aged 6-11 years old and renting a house of 697 euro per month. Annual taxable income is displayed on the horizontal axis; the income tax, tax credits, and allowances are displayed on the vertical axis (all on annual basis). For convenience, we assume all taxable income is salaried income.<sup>3</sup>

The upward-sloping dashed gray line shows the amount of income tax this person needs to pay according to the statutory tax rate, which equals about 37% of income in the lower and middle income ranges.<sup>4</sup> The first 9,100 euro of income are effectively tax free, however, because of the general tax credit, which is depicted by the red line. Above a taxable income of 9,100 euro, the general tax credit remains constant until taxable income reaches 24,800 euro, after which it is slowly phased out. In addition to the general tax credit, several other tax credits apply to this household – the ‘combination credit’ displayed by the upward-sloping green line and the earned income tax credit (which applies only to labor income) displayed by the orange line – both of them featuring different phase-in and phase-out patterns. In addition, four different allowances apply that all start at a positive level, remain constant for

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<sup>3</sup>The Dutch tax-and-transfer system is for most part individualized, except for elements related to assets and savings, housing, and childcare.

<sup>4</sup>From a taxable income of 78,426 euro, the tax rate is about 50%. The progressivity of the income tax is not visible in Figure 1 due to the limited range of the vertical scale.

some time, and then start phasing out, at a taxable income of approximately 27,000 euro: the childcare allowance (in this example based on two days of formal childcare per week), the child budget, the rent allowance, and the health insurance allowance. Lastly, the Dutch tax and transfer system contains a child benefit scheme that is independent of income, the solid gray line.

Clearly, in a complicated tax-and-transfer system such as the one sketched in Figure 1, it is very difficult for people to reliably estimate their effective marginal tax rate. It requires summing up *the slopes of all lines* evaluated at one’s taxable income. Figure 2 plots the effective marginal tax rates for a representative sample of the Dutch workforce. For low income groups, effective marginal tax rates are often very low, as a result of the general tax credit, the earned income tax credit, and the fact that allowances are initially not declining with income. As these allowances and credits start to phase out starting at an annual taxable income of about 27,000 euro, the effective marginal tax rate steeply increases and can reach levels of 80 to 90%. At higher income levels, effective marginal tax rates decline again and show less heterogeneity, as credits and allowances completely phase out. Note, however, the very slow phase-out of the earned income tax credit. This feature makes that the effective marginal tax rate is above the statutory rate of 50% for most people in this income range.

## 2.2 The Dutch labor market

Three features of the Dutch labor market make that workers have relatively high agency in choosing their work hours. First, part-time work is widespread (OECD, 2025). Nowadays, a majority of Dutch workers work part-time. The Netherlands consistently ranks in the top 3 countries in the world with the highest share of part-time work of total employment. Second, Dutch labor law gives workers a legal right to adjust their hours, unless their employer can make a strong case against it (Brega et al., 2024). Third, there have been increasing labor shortages in the last decade (OECD, 2025), plausibly strengthening workers’ bargaining power. All these aspects make that Dutch workers have relatively strong flexibility in

choosing their work hours. The effects we find of our treatment should be considered in light of this context.

### 3 Experimental design and hypotheses

#### 3.1 Experimental design

We conducted a two-wave survey experiment among a representative sample of the working-age population in the Netherlands in August and October 2024. In the first wave, we collected data on respondents' beliefs about their effective marginal tax rate, their working hours, their preferences over job aspects, and their constraints in increasing their working hours. We also implemented our information treatment in the first wave in a randomized fashion. In the second wave, which took place two months later, we again ask respondents about their beliefs regarding their effective marginal tax rate, working hours, and preferences over job aspects.

The first questionnaire started with a few basic questions (do you have a paid job?; are you a student?) and then asked respondents what they think their effective marginal tax rate is. We asked this in the following way:

*“How much do people gain on net when their gross income increases? That depends on how much tax they have to pay and how much allowance they can receive (rent allowance, healthcare allowance, childcare allowance, child budget). How about you? How much would you gain on net when your gross income increases? Suppose you had an **extra €100 gross income** per month in 2023, how much would you have gained on net?”*

Respondents answered the question by typing a number in an open field.<sup>5</sup> We also asked respondents to indicate how sure they are of their answer on a 5-point scale.

After this belief elicitation, we informed the respondents who were randomly assigned to

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<sup>5</sup>In a brief note we clarified to respondents that they could enter a negative number if they think their net disposable income would decline.

the treatment group about the effective marginal tax rates that people face in three different income groups. The information treatment was phrased in the following way:

*How much do people gain on net when their gross income increases? That depends on how much tax they have to pay and how much allowance they can receive (rent allowance, healthcare allowance, childcare allowance, child budget). Suppose someone starts working more hours and his/her gross monthly income increases by **€100**. How much does he/she gain? Recent figures from the Dutch government show the following effects per income group:*

- *Let's look first at people with gross monthly incomes up to €2,000. Almost all of these people gain **€80 - €90** with €100 additional gross monthly income.*
- *Then let's look at people with gross monthly incomes of €2,000 - €3,000. Almost all of these people gain **€45 - €80** with €100 additional gross monthly income.*
- *Finally, let's look at people with gross monthly incomes over €3,000. Almost all of these people gain **€35 - €45** with €100 additional gross monthly income.*

Immediately below this text, we explain that “almost all of these people” means about 90% of the people in that income group. We also write that the estimates are based on the past year, i.e. 2023.<sup>6</sup>

Next, we ask all respondents (both those in the treatment group and those in the control group) about the weekly number of hours they currently work in a paid job, which is our main labor supply variable. As a secondary labor-supply variable, we also ask respondents to list the three job aspects they find most important among the following eight: a high gross

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<sup>6</sup>In addition to this “general information” treatment, our experiment also included a second treatment arm (“personalized information”) where respondents were encouraged to visit a website of a well-known not-for-profit institute (NIBUD) and enter information about their personal situation to get a precise estimate of their effective marginal tax rate. As it turned out, very few subjects in this treatment arm actually followed up and used the online tool. In the second wave of the questionnaire, only 5% of the respondents in this treatment arm report having used the tool. Given that 95% of respondents effectively remained untreated, we can not meaningfully perform our planned Treatment on the Treated analysis. We therefore relegate the analysis of the second treatment arm to the Appendix, see Figure A.4. A third treatment arm combined “general information” and “personalized information”, with similar low follow-up in the use of the online tool. We pool the first and third treatment arm into a single treatment group in the analysis in the main text. This has the benefit of a slight increase in the precision of our treatment estimates.

salary, career and promotion opportunities, work pleasure, meaning, low stress and work pressure, flexibility, little commuting time, and nice colleagues. Lastly, we ask respondents to indicate whether they face any constraints to increase their work hours and, if so, which of the following constraints is relevant for them: their own health, partner support, childcare, family care, and study.

In the second wave of the questionnaire, we ask in exactly the same way as in the first wave about the respondent’s belief about the effective marginal tax rate, the work hours, and the most-preferred job aspects.<sup>7</sup>

### 3.2 Hypotheses

In line with our preregistration, our main prediction is that the information treatment leads respondents to update their beliefs about the effective marginal tax rate and consequently change their labor supply. The direction of the belief update and labor supply adjustment depends on whether respondents initially underestimate or overestimate their effective marginal tax rate. We expect those who initially underestimate their effective marginal tax rate to increase their perceived effective marginal tax rate, to reduce their work hours, and to give higher priority to the non-monetary job aspects at the expense of a high gross wage.<sup>8</sup> Vice versa, we predict those who initially overestimate their effective marginal tax rate to reduce their perceived effective marginal tax rate, to increase their work hours — with the exception of those who indicate in the first wave that they face constraints to increase their work hours — and to give higher priority to a high gross wage at the expense of the non-monetary job aspects. Lastly, we expect respondents whose initial belief about their effective marginal tax rate is ‘about right’ not to respond to our information treatment.

We classify a respondent’s initial belief as ‘about right’ when it falls within the tax-rate

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<sup>7</sup>In addition to the outcome variables described, we also collected data on a number of intermediate variables (‘did you take any steps to ...’) and on intentions (‘are you planning to ...’). For succinctness, we focus on the two most important preregistered labor supply variables: actual hours and preferences over job aspects.

<sup>8</sup>The latter hypothesis was inspired by Lockwood et al. (2017).

range applicable to the respondent’s income group as communicated by our information treatment, plus an error margin of 5 percentage points. We refer to people who believe marginal tax rates are higher than the upper bound of the communicated tax range plus 5 percentage points as overestimators, and those who believe marginal tax rates are lower than the lower bound minus 5 percentage points of the communicated tax range as underestimators. The motivation for using this classification method is that subjects in the treatment group do not learn the precise effective marginal tax rate that applies to their situation. Instead, they receive information about the range of tax rates that applies to different income classes, and we therefore expect them to adjust their beliefs and labor supply based on that coarse information. We allow for an error margin of 5 percentage points, but our main results are not sensitive to the magnitude of the error margin.

## 4 Data

The two questionnaire waves were administered in August 2024 and October 2024, respectively, through the LISS panel, an existing panel that is representative of the Dutch population. A total of 4,859 LISS panel members were invited to fill out the first survey wave in August 2024. Given the focus of our study on labor supply, people over the age of 67 (the current retirement age in the Netherlands) and those who are unable to work due to disability were not invited. The survey was fully completed by 3,274 people, implying a response rate of 67.4%. All respondents of the first wave were approached in October 2024 to fill out the second-wave questionnaire. A total of 2,788 people did so, implying a response rate of 83.5%. Because 25 respondents invited for the second wave did not fully complete the first wave, and income information was missing for 176 respondents, our sample reduces to 2,587 complete responses. We further exclude 46 respondents who report extreme beliefs on their effective marginal tax rate in either of the two waves. We classify beliefs as extreme if they imply that the tax rate is negative (i.e. that the net earnings of additional hours worked

exceed the gross earnings) or that the tax rate is more than 200%.<sup>9</sup> Of the remaining 2,541 respondents, we exclude the 663 respondents from the personalized information treatment, see footnote 6. Our final sample therefore includes 1,878 respondents.

Table 1 shows the descriptive statistics of the respondents in the control group and the treatment group. There are no statistically significant differences in any of the characteristics at the 5% significance level. Slightly more than 50% of our respondents is female. On average, respondents are 44 years old. A bit more than 70% has a partner. Almost half is highly educated. Close to 90% has a paid job and 13% is student. People work on average 28 hours a week. Figure A.1 in the Appendix shows the distribution of hours worked. Only 41% of respondents works more than 35 hours per week, the majority works parttime. Average gross monthly earnings are about 3,300 euro. A small majority of our respondents earns more than 3,000 euro per month. About 30% earns less than 2,000 euro per month.

We calculated respondents' actual effective marginal tax rate using information from the background variables on income and household situation in the August 2024 wave of the LISS panel. On average, respondents face an effective marginal tax rate of about 43%. The average perceived effective marginal tax rate is slightly higher at about 47%. The average absolute value of the misperception is, however, sizeable at 21.4 percentage points. We will more extensively discuss the incidence and nature of the tax misperceptions in the next section.

Attrition rates are similar in control and treatment group at about 23%. This indicates that the random assignment was successful and that the treatment did not cause selective attrition between the two survey rounds.

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<sup>9</sup>An alternative to excluding respondents with extreme beliefs is to transform our misperception variable into deciles. All of our results are then very similar regardless of whether we include or exclude respondents with extreme beliefs.

## 5 Results

In this section, we first discuss respondents’ misperceptions about the effective marginal tax rate. Next, we present the evidence on the effects of our information treatment on misperceptions, hours worked, and job preferences.

### 5.1 Misperceptions

Table 1 in the previous section already showed that respondents’ average absolute misperception is 21.4 percentage points at baseline.<sup>10</sup> Under- and overestimation of the effective marginal tax rate are almost equally common. Using the classification described in section 3.2, we classify 36.4% of the sample as overestimator, 40.4% as underestimator, and about one quarter (23.2%) as about right.

Figure 3 displays the distribution of misperceptions, defined as the difference between the perceived and actual effective marginal tax rate, for the full sample (upper-left panel) and across the three gross income categories that were also used in the information treatment. The dashed lines show the average misperception per income category. Interestingly, in each of the four figures, the mode of the distribution is where respondents’ beliefs are correct. The figure illustrates that there is substantial heterogeneity in misperceptions across income categories as well as across individuals within an income category. While over- and underestimation occur in each of the income categories, respondents with lower incomes (less than €2.000 per month) are far more likely to overestimate their effective marginal tax rate than respondents with higher incomes. On average, they overestimate their effective marginal tax rate by 28 percentage points, while middle- and high-income groups underestimate by 2.38 and 4.40 percentage points, respectively. In the high-income group, the underestimators clearly outnumber the overestimators.

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<sup>10</sup>Reassuringly, the absolute size of misperception is negatively correlated with the confidence that people have in their estimate of the effective marginal tax rate, except for the group that claims to be ‘completely certain’. The latter group, which comprises about 4% of the subjects, is actually almost as far off from the true effective marginal tax rate as the group that is ‘completely unsure’, which comprises 10% of the subjects. See Figures A.2 and A.3 in the Appendix.

## 5.2 Treatment effects

Do misperceptions about the effective marginal tax rate reduce as a result of the information treatment? Do we observe treatment effects on labor supply? We study these issues using the data collected two months after treatment. Following our hypotheses as described in section 3.2, we study treatment effects on beliefs and labor supply of three different groups: the underestimators, the group whose beliefs were about right in wave 1, and the overestimators. Our empirical strategy is to run OLS regressions for each of these three subsamples of the change in an outcome variable on a treatment dummy. We do not include control variables throughout our analyses, but all our findings are robust to controlling for demographic characteristics.

Figure 4 shows the main results of our study. The left panel shows that our information treatment led to substantial reductions in absolute misperceptions for the groups of underestimators (by 3.7 percentage points from a baseline of 16.7%;  $p = 0.06$ ) and overestimators (by 6.0 percentage points from a baseline of 43.7%;  $p = 0.03$ ). In line with our predictions, our treatment did not change misperceptions among those whose beliefs were already about right.

The right panel of Figure 4 shows the estimated treatment effects on work hours. In line with the change in beliefs shown in the left panel, and in line with the predictions, underestimators decrease their work hours, those who were about right remain at the same number of work hours, and overestimators increase their work hours as compared to control group respondents with similar beliefs. The decrease in work hours of underestimators is small (a reduction of less than half an hour per week from a baseline of 29.14 hours) and not statistically significant ( $p = 0.45$ ). The increase in work hours of the overestimators is more than three times as large (about one and a half hour per week from a baseline of 19.1 hours) and statistically significant ( $p = 0.03$ ). The estimates imply a compensated wage elasticity of labor supply of +0.3, which is comparable to what is typically found in the empirical literature (see Blundell and Macurdy (1999) and Keane (2011) for comprehensive

reviews).<sup>11</sup>

Next, we study whether the treatment effect differs depending on whether respondents reported in the first survey wave that health or caregiving constraints limit their possibility to increase their work hours.<sup>12</sup> We classify 38% of respondents as being constrained, and 62% of respondents as unconstrained. Figure 5 shows the treatment effects on misperceptions and work hours separately for constrained and unconstrained respondents. In line with our predictions, we find that the positive treatment effect on work hours is concentrated in the group who faces no constraints (upper right panel). The treatment effect on work hours among overestimators without constraints is slightly more than 2 work hours per week ( $p = 0.03$ ). As expected, we find a much smaller (0.45 hours) and statistically insignificant ( $p = 0.58$ ) effect on work hours among constrained overestimators. We also find a remarkable difference in belief updating. Unconstrained overestimators reduce their misperception by 9 percentage points, whereas constrained overestimators do so by less than 2 percentage points, which is statistically indistinguishable from zero. One interpretation of this finding is that people who are constrained to increase their work hours tend to ignore or forget the information about effective marginal tax rates because it is not relevant for them, consistent with the theory of rational inattention (Maćkowiak and Wiederholt, 2026). However, we should be careful not to overinterpret this finding as this analysis is not preregistered.

Another group who is arguably constrained to increase their work hours is people on welfare and unemployment benefits. This group comprises 67 respondents, or 3.6% of our sample. Even though about half of them ( $N=36$ ) is already classified as constrained, we

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<sup>11</sup>We obtain the compensated wage elasticity of +0.3 as follows. Overestimators reduced their perceived marginal tax rate by 7 percentage points, from on average 70% to 63%. Hence, the information treatment resulted in a change in the perceived net wage of 23% ( $100\% \times [(1 - 0.63) - (1 - 0.70)] / (1 - 0.70) = 23.3\%$ ). They increased work hours by about 1.45 hours per week from a baseline of 19.1 hours per week, which is an 7.6% increase. The implied compensated wage elasticity =  $7.6 / 23.3 = 0.3$ .

<sup>12</sup>We classify respondents as constrained to work more hours if they disagree or strongly disagree with at least one of the following statements: “My health is good enough to work more hours”; “The care for my (grand)children can be well managed if I want to work more hours”; “The caregiving for my loved one(s) can be well managed if I want to work more hours;” or if they agree or agree strongly with the statement “My study can not be combined with working more hours”. Respondents who are neutral or agree with all the statements are classified as having no constraints ( $N=1,169$ ), whereas respondents who disagree with at least one of the statements are classified as being constrained ( $N=709$ ).

also run our analysis classifying all of them as constrained. The results are very similar, with slightly more pronounced treatment effects on beliefs and hours worked among the unconstrained, see figure A.5 in the appendix. Excluding those individuals from the main analysis also does not change the results.

We have seen that the information treatment mainly affected the tax misperceptions and work hours of overestimators: they lower their perceived effective marginal tax rate and increase their work hours. We have also seen that overestimators are strongly overrepresented among people with low income. Does it follow that the information treatment reduced income inequality? Figure 6 provides strong evidence for this by showing treatment effects for three different income categories. Hours worked per week increase substantially among people with low monthly income by 1.8 hours (from a baseline of 12.5 hours, so by 14.3%), while they remain the same in the higher income categories. It thus follows that monthly incomes must have increased at the bottom of the income distribution while they remained the same higher up, implying that the information treatment did not only make individual labor supply choices more efficient, but also lowered income inequality.<sup>13</sup>

Finally, we investigate the effect of the information treatment on the job aspects people mention as most important in a job. We predict that respondents who initially overestimate their effective marginal tax rate give higher priority to earning a high gross wage after receiving information, and the opposite for respondents who initially underestimate. We measure priority to earning a high gross wage in two ways: whether respondents in the second survey wave rank gross salary as the most important job aspect and whether they rank gross salary among the three most important job aspects. As respondents also had the option to select career and promotion opportunities, which usually come with a higher salary, we also analyze the effect of treatment on whether either high gross salary or opportunities for growth and promotion are ranked first, and whether at least one of either job aspect is

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<sup>13</sup>This conclusion holds under the mild assumption that the increase in labor supply does not affect the hourly wage of low-income workers or, at least, that the hourly wage does not decline more in percentage terms than the percentage increase in work hours.

ranked among the top three.

We regress each of the four outcome measures on the treatment indicator separately for the three initial-belief categories (underestimators, about right, and overestimators).<sup>14</sup> The results are reported in Table 2. We find no evidence that the treatment induces underestimators to place less emphasis on gross salary or financial aspects more broadly. The coefficients go in different directions and are far from statistically significant. Likewise, we find no evidence that the treatment induces overestimators to place more emphasis on financial aspects.

## 6 Conclusions

In a country with a highly complex tax system, we have found that many people hold incorrect beliefs about their effective marginal tax rate. People with low income on average think that their effective marginal tax rate is much higher than it actually is, while people with high income tend to think their effective marginal tax rate is slightly lower than the actual rate. We have shown that a simple intervention providing coarse information about the effective marginal tax rate changes people’s beliefs and their behavior as measured two months later. People who initially overestimated their effective marginal tax rate reduce their belief and increase their work hours, consistent with a compensated wage elasticity of labor supply of about 0.3. Those who initially underestimated their effective marginal tax rate also hold more accurate beliefs two months later and slightly reduce their work hours. However, these effects are much less pronounced than among the overestimators. Since people with low income are strongly overrepresented among the overestimators, our information intervention also led to a meaningful decrease in income inequality. Reducing tax misperceptions through information provision thus has the potential to both promote efficiency of individual labor supply and reduce income inequality in society.

While our information intervention removed a substantial part of the inaccuracy in be-

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<sup>14</sup>Controlling for gender, income, and education hardly changes the estimation results,

liefs, the lion's share of tax misperceptions remained. This appears partly due to the limited relevance of the information for some of the receivers: people who are constrained in changing their work hours (e.g. because of health or care reasons) adjust both their beliefs and their work hours much less in response to the information, in line with the theory of rational inattention. However, also among those who face no constraints in changing hours (the majority of our sample), sizeable misperceptions remain. Future research could try to improve the intervention, for instance by providing more information, making the information more personalized, or by improving the timing of the information provision.

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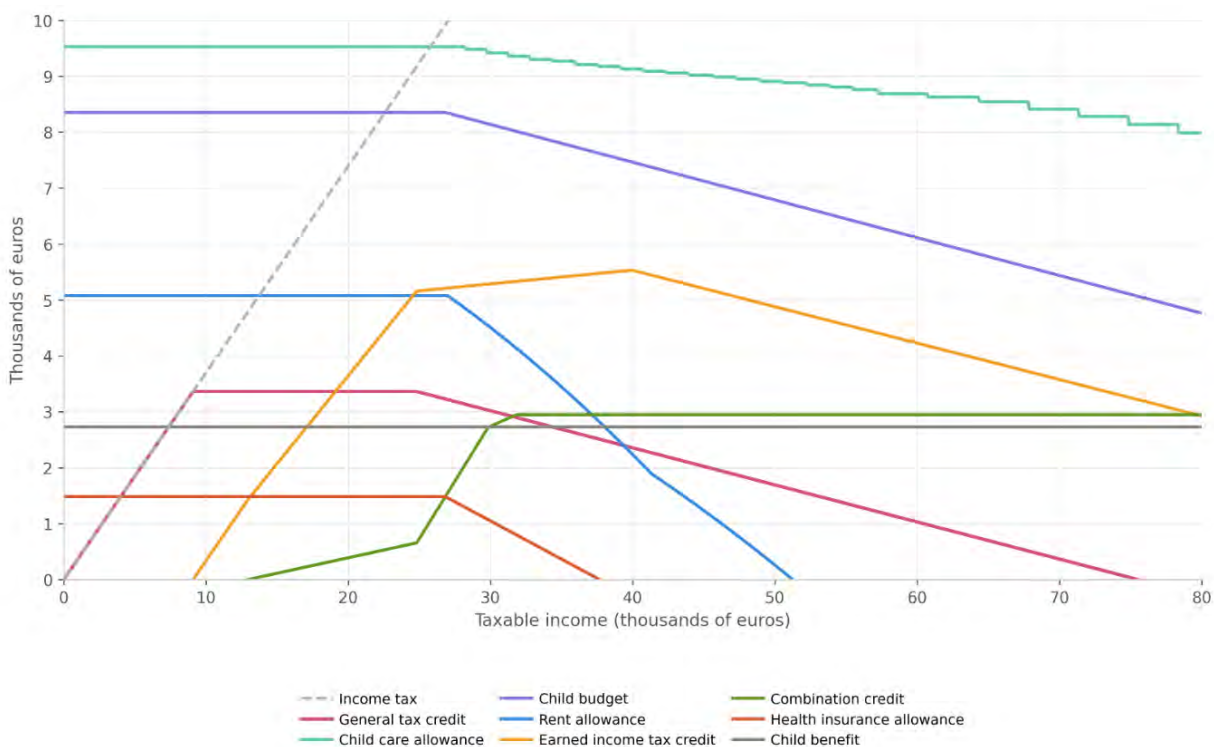
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# Figures and Tables

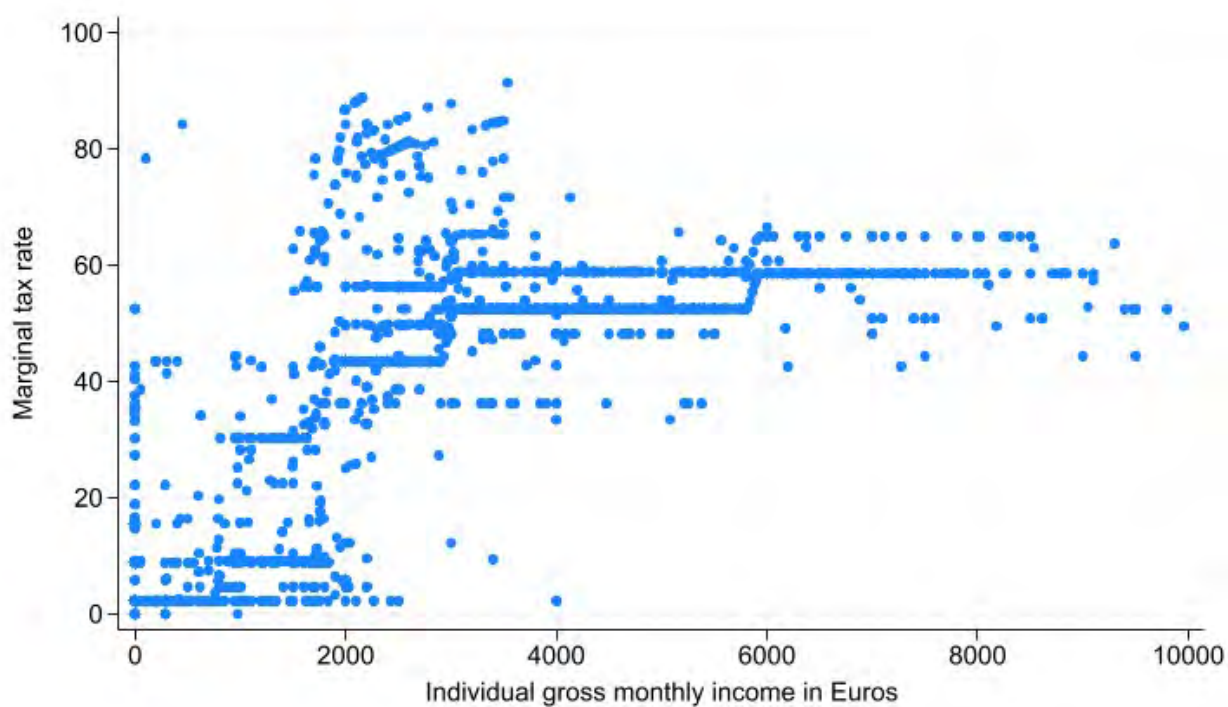
## Figures

**Figure 1:** The Dutch tax-and-transfer system



Source: own calculations.

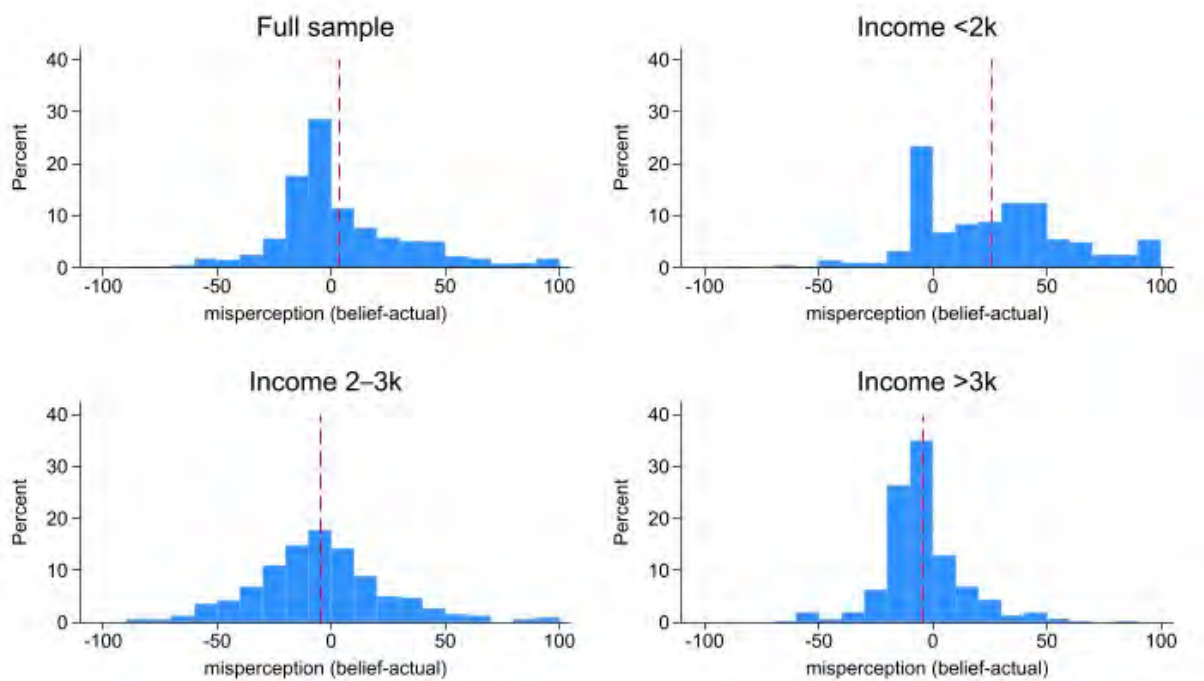
**Figure 2:** Effective marginal tax rates for a representative sample of the Dutch working-age population



Each dot represents an individual in our sample. A similar figure for the full Dutch population can be found in Kamerstuk 36418 (Official document Dutch National Parliament; letter sent by the Deputy Finance Minister, the Finance Minister, and the Minister of Social Affairs and Employment, 18 June 2024:

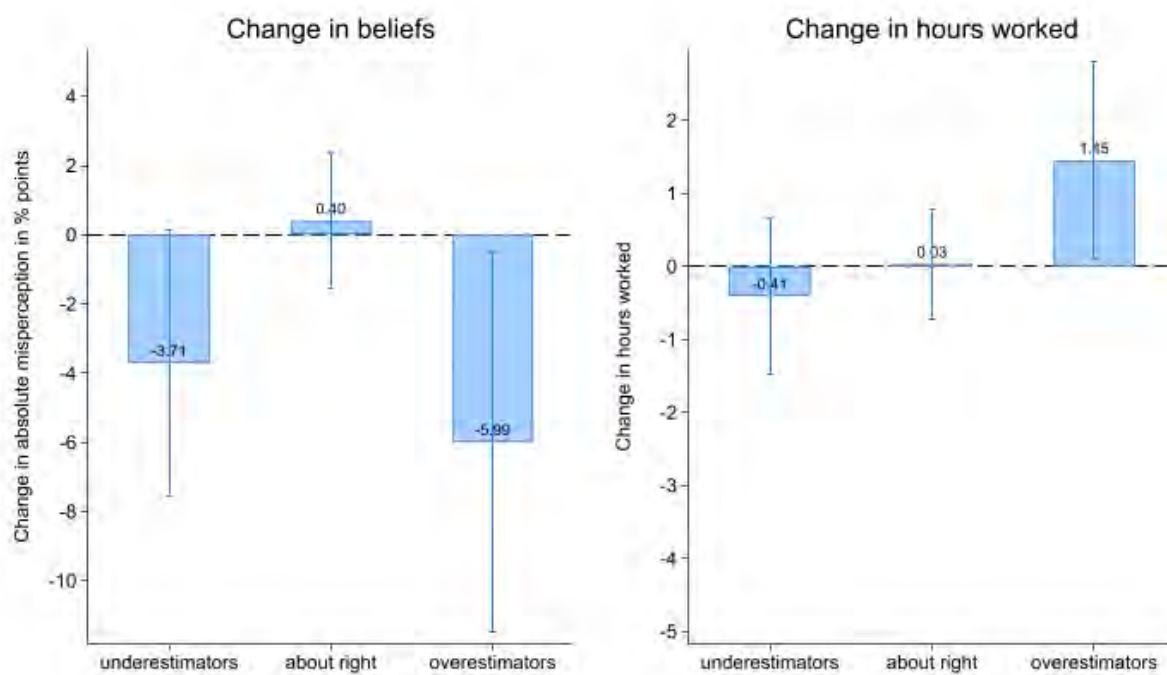
<https://zoek.officielebekendmakingen.nl/kst-36418-146.html>)

**Figure 3:** Distribution of misperceptions by income group



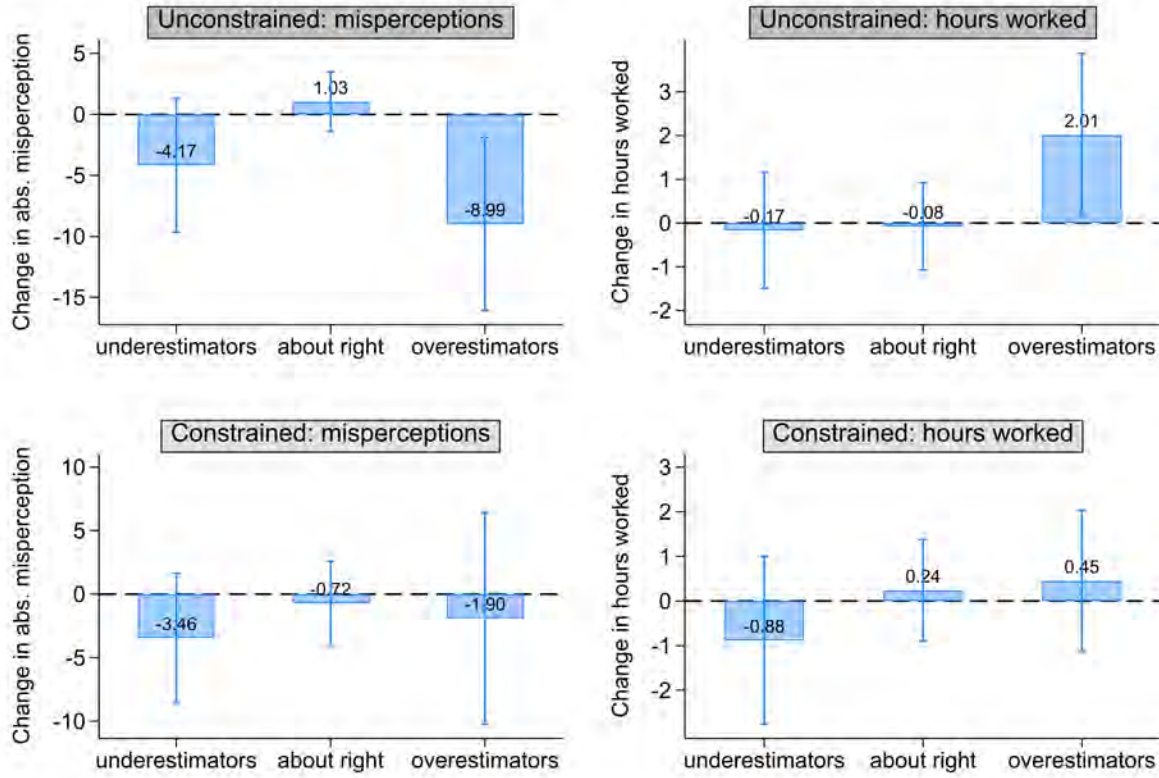
Note: Dashed lines indicate the average misperception of that income group. Income is gross monthly income. Sample sizes are N=539, N=343, and N=996 for low, medium, and high income categories, respectively.

**Figure 4:** Treatment effect on absolute misperceptions and work hours



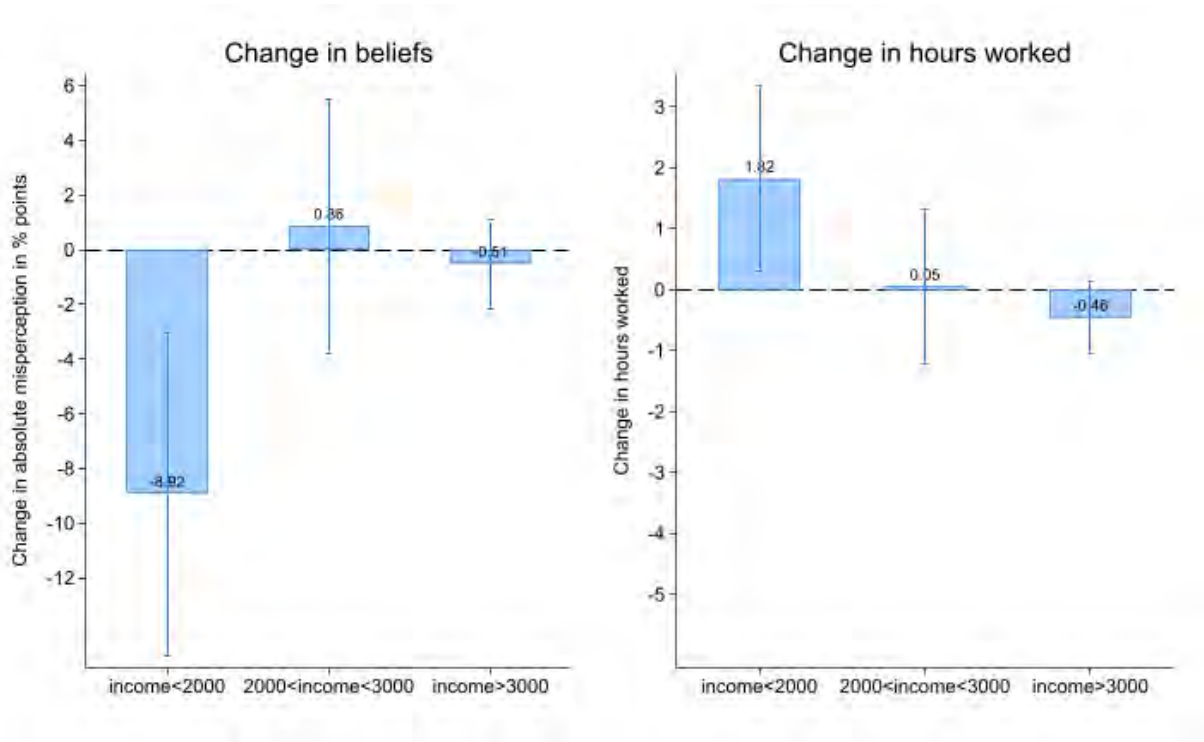
Note: The left panel shows the estimated treatment effect on absolute misperception of the effective marginal tax rate by initial belief category. The right panel show the same for work hours. Whiskers indicate the 95% confidence interval based on heteroskedasticity robust standard errors.

**Figure 5:** Treatment effect on absolute misperceptions and labor supply among constrained and unconstrained respondents



Note: Figure shows the average change in absolute misperceptions and hours worked from survey wave 1 to wave 2, by initial-belief category and whether respondents face constraints. Negative values indicate reductions in absolute misperception and hours worked, respectively. Whiskers indicate the 95% confidence interval based on heteroskedasticity robust standard errors. The upper panel shows results for respondents who indicate in wave 1 that they are not constrained to work more hours by their health, childcare or caregiving responsibilities, or study. (N=1169) The lower panel shows results for respondents who report having at least one of those constraints (N=709).

**Figure 6:** Treatment effect on absolute misperceptions and labor supply by monthly income category



Note: The left panel shows the average change in absolute misperception from wave 1 to wave 2 relative to the control group for three individual income categories. The right panel show the average change in hours worked from wave 1 to wave 2 relative to the control group for the same three individual income levels. Negative values indicate reductions in absolute misperception and hours worked, respectively. Whiskers indicate the 95% confidence interval based on heteroskedasticity robust standard errors.

## Tables

**Table 1:** Descriptive statistics: averages by treatment status

|                                           | Control  | Treatment | P-value |
|-------------------------------------------|----------|-----------|---------|
| <b>Demographics</b>                       |          |           |         |
| % Female                                  | 0.53     | 0.55      | 0.57    |
| Age in years                              | 44.72    | 43.88     | 0.22    |
| Partner (1=yes)                           | 0.71     | 0.73      | 0.58    |
| % Highly educated                         | 0.46     | 0.50      | 0.18    |
| % Paid job                                | 0.90     | 0.88      | 0.19    |
| % Student                                 | 0.13     | 0.13      | 0.84    |
| <b>Work and income</b>                    |          |           |         |
| Hours worked per week first wave          | 28.62    | 27.54     | 0.11    |
| Gross monthly income in €                 | 3,354.45 | 3,316.90  | 0.78    |
| % income < €2,000                         | 0.28     | 0.29      | 0.72    |
| % €2,000 ≤ income ≤ €3,000                | 0.19     | 0.18      | 0.59    |
| % income > €3,000                         | 0.53     | 0.53      | 0.93    |
| <b>Taxes and prior beliefs</b>            |          |           |         |
| Effective marginal tax rate (%)           | 43.27    | 42.14     | 0.30    |
| Perceived effective marginal tax rate (%) | 46.67    | 48.46     | 0.16    |
| Absolute misperception (%)                | 20.85    | 21.69     | 0.46    |
| Observations first wave (N=2,432)         | 843      | 1,589     |         |
| Observations final sample (N=1,878)       | 639      | 1,239     |         |
| Attrition rate                            | 24.2%    | 22.0%     | 0.22    |

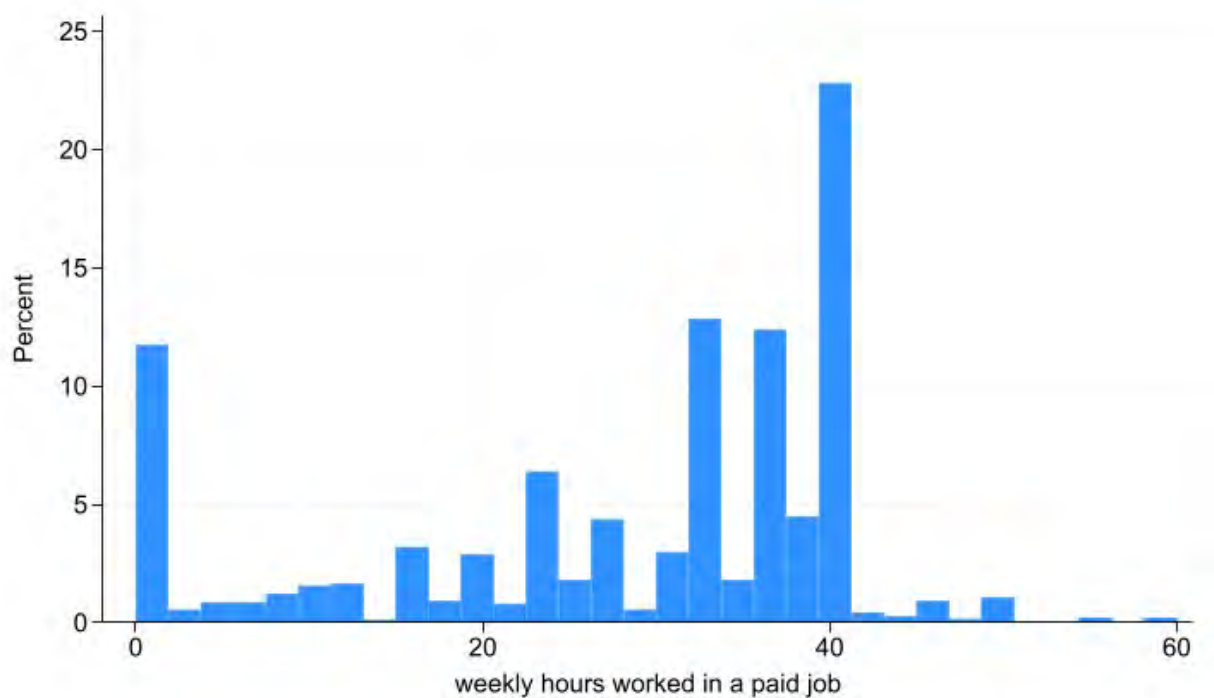
**Table 2:** Treatment effect on job preferences

| Dependent var          | (1)<br>Wage most<br>important | (2)<br>Wage in top 3 | (3)<br>Financial aspects<br>most important | (4)<br>Financial aspects<br>in top 3 |
|------------------------|-------------------------------|----------------------|--------------------------------------------|--------------------------------------|
| <b>Underestimators</b> |                               |                      |                                            |                                      |
| Reference=control      |                               |                      |                                            |                                      |
| Treatment              | -0.0118<br>(0.0310)           | 0.0505<br>(0.0442)   | -0.0328<br>(0.0338)                        | 0.00414<br>(0.0447)                  |
| Observations           | 544                           | 544                  | 544                                        | 544                                  |
| R-squared              | 0.000                         | 0.002                | 0.002                                      | 0.000                                |
| Baseline proportion    | 0.14                          | 0.44                 | 0.16                                       | 0.53                                 |
| <b>About right</b>     |                               |                      |                                            |                                      |
| Treatment              | -0.0215<br>(0.0251)           | 0.0731**<br>(0.0362) | -0.0105<br>(0.0265)                        | 0.0898**<br>(0.0368)                 |
| Observations           | 817                           | 817                  | 817                                        | 817                                  |
| R-squared              | 0.001                         | 0.005                | 0.000                                      | 0.007                                |
| Baseline proportion    | 0.13                          | 0.42                 | 0.15                                       | 0.48                                 |
| <b>Overestimators</b>  |                               |                      |                                            |                                      |
| Treatment              | -0.0126<br>(0.0267)           | -0.0498<br>(0.0426)  | -0.00128<br>(0.0294)                       | -0.0474<br>(0.0442)                  |
| Observations           | 517                           | 517                  | 517                                        | 517                                  |
| R-squared              | 0.000                         | 0.003                | 0.000                                      | 0.002                                |
| Baseline proportion    | 0.09                          | 0.28                 | 0.11                                       | 0.32                                 |

Table shows the estimated coefficients from regression analyses, where treatment is regressed on the dependent variables shown at top of each column. The sample in the top, middle, and bottom panel is restricted to respondents who are classified as underestimator, receiving no news, or overestimator, respectively. Robust standard errors are in parentheses, stars indicate statistical significance: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

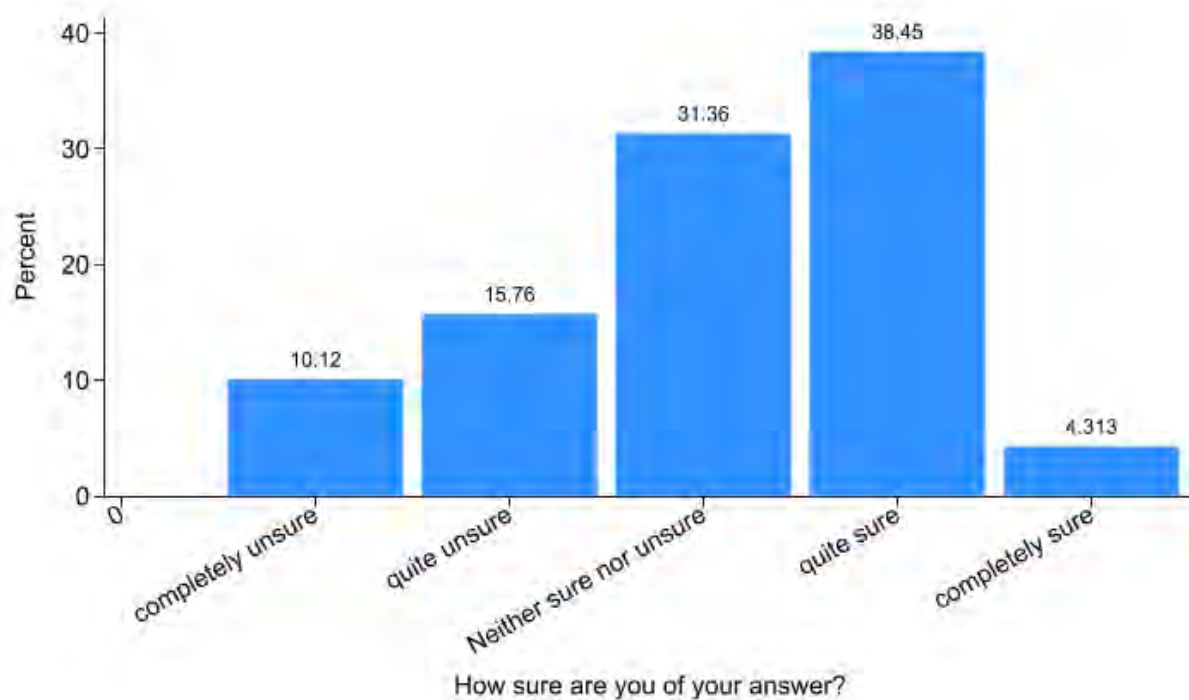
## A Appendix

**Figure A.1:** Distribution of hours worked



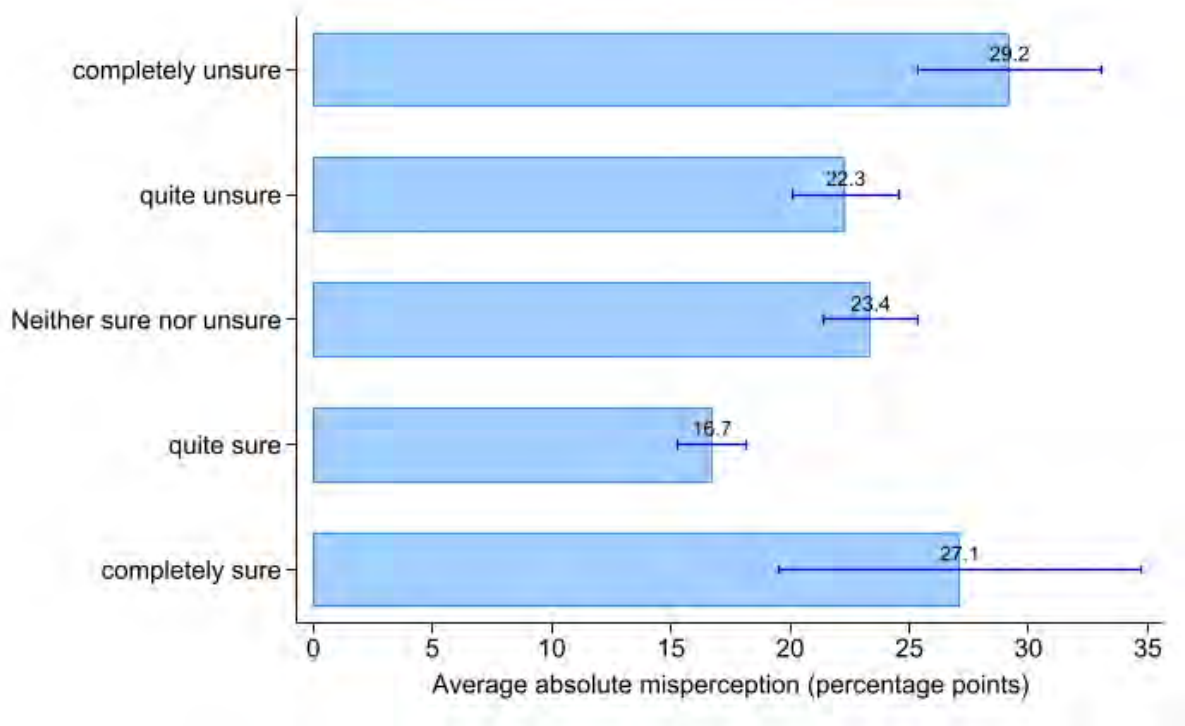
Note: The figure shows the distribution of hours worked per week at baseline (survey wave 1). Values above 60 are not shown for visibility. One respondent reports working 65 hours and one respondent 72 hours.

**Figure A.2:** Confidence in belief about effective marginal tax rate



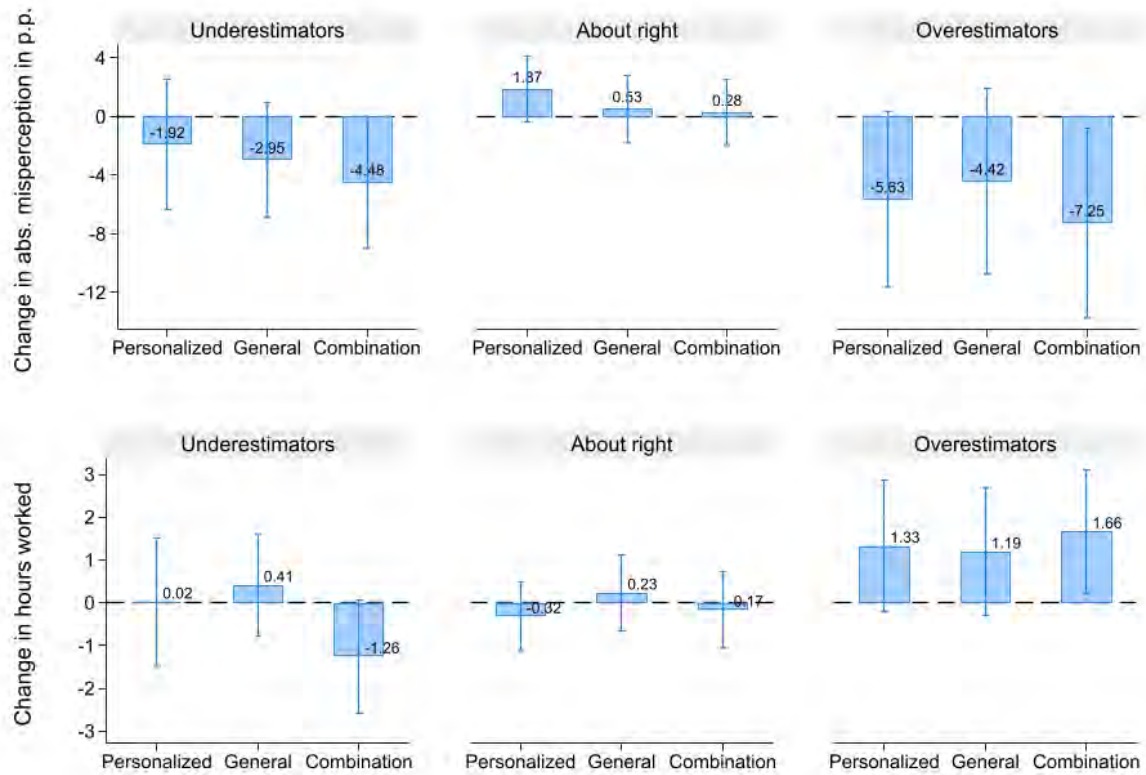
Note: The figure shows the distribution of answers to the question "How sure are you about your answer?", elicited on a five-point scale, and asked directly after the question to estimate the effective marginal tax rate.

**Figure A.3:** Average absolute misperception by level of confidence



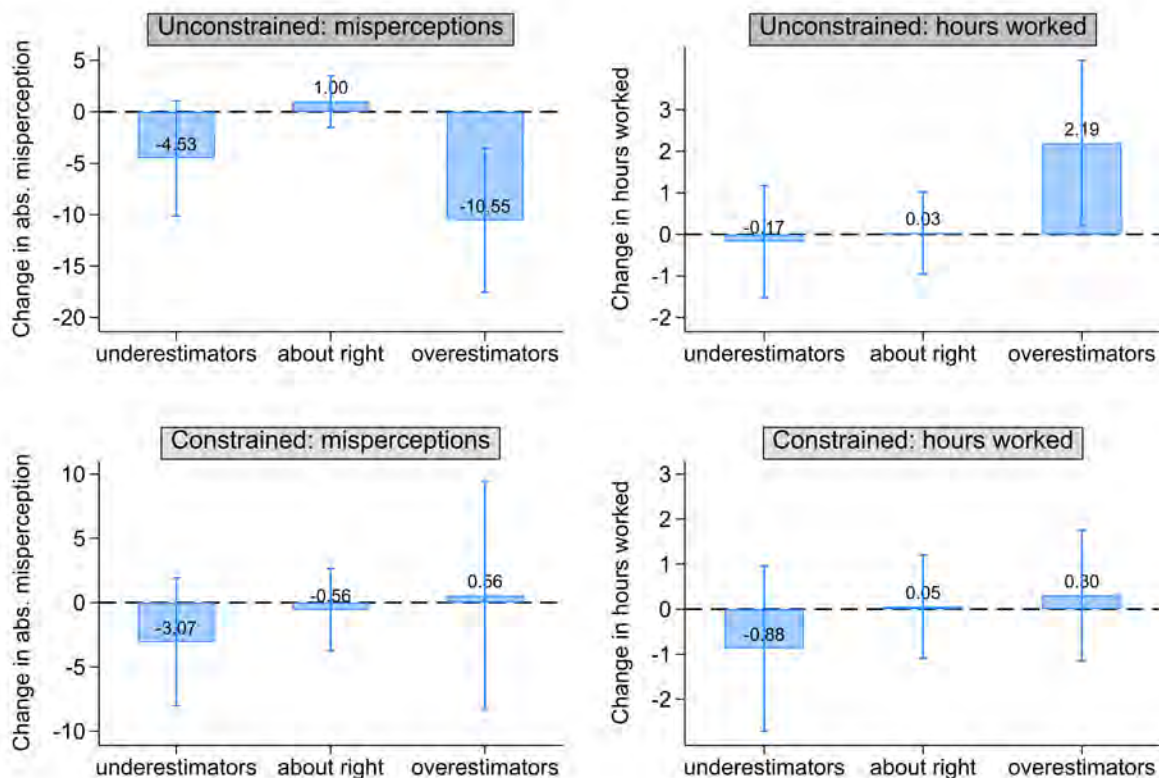
Note: The figure shows the average absolute misperceptions people have regarding the effective marginal tax rate by level of confidence. Whiskers indicate the 95% confidence interval.

**Figure A.4:** Treatment effects: all treatments



Note: Figure shows the average change in absolute misperceptions and hours worked from survey wave 1 to wave 2, by treatment and initial-belief category. “Personalized” refers to the treatment that provides a link to the online tool; “General” refers to the treatment that provides general information only, “Combination” refers to the treatment that in addition to the general information provides the link to the online tool. Negative values indicate reductions in absolute misperception and hours worked, respectively. Whiskers indicate the 95% confidence interval based on heteroskedasticity robust standard errors. The upper panel shows effects on beliefs, the lower panel shows effects on hours worked.

**Figure A.5:** Treatment effect on absolute misperceptions and labor supply among constrained and unconstrained respondents classifying those on welfare and unemployment benefits as constrained



Note: Figure shows the average change in absolute misperceptions and hours worked from survey wave 1 to wave 2, by initial-belief category and whether respondents face constraints. People on welfare and unemployment benefits are classified as constrained. Negative values indicate reductions in absolute misperception and hours worked, respectively. Whiskers indicate the 95% confidence interval based on heteroskedasticity robust standard errors. The upper panel shows results for respondents who are not on welfare or unemployment benefits and who indicate in wave 1 that they are not constrained to work more hours by their health, childcare or caregiving responsibilities, or study. (N=1138) The lower panel shows results for respondents who report having at least one of those constraints or receive welfare or unemployment benefits (N=740).