Appendix for "The Effect of Raising Income Expectations on Tax Preferences"

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A Appendix for Survey Experiment

In the following, I present additional analyses of my survey and present the survey in itself.

A.1 Online Questionaire and Ethics

A translated version of the full survey questionnaire is found in the end of this appendix, in section B. The survey can be previewed via the following link: https://copensocialscience.eu.qualtrics.com/jfe/preview/previewId/75398ed9-e3b5-4c11-849e-5d6e17a3bdea/SV_1C7RiAvXQKpoa6W?Q_CHL=preview&Q_SurveyVersionID=current[1]

Ethics: This study was conducted in accordance with the General Data Protection Regulation (GDPR) and ethical standards of the University of Copenhagen. All survey responses were collected anonymously, ensuring that no personally identifiable information was recorded. Participants were informed about the study's purpose and provided implicit consent by completing the survey. Respondents could provide their emails to receive a reward for participating in the survey, and emails were collected in a separate survey and cannot be linked to actual responses. Respondents were only given truthful information and were provided with sources of this information after completing the survey.

A.2 Distribution

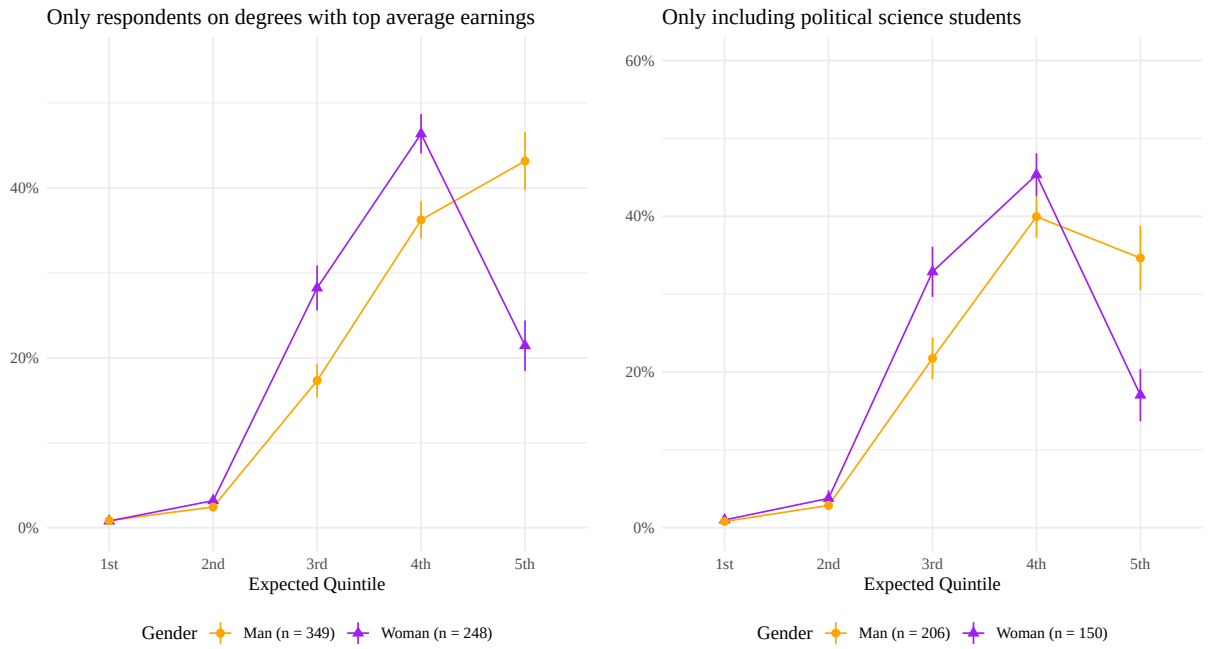
The survey was launched softly on April 9th, to see whether any malfunctions appeared. The main problem I had to resolve was with the tax slider. I had written custom Javascript code for the slider to add a percentage symbol, which turned out only to work in a Chrome browser on a computer. Respondents on their phones and Safari could not make it work. This issue was resolved after a few days by removing the percentage symbol, whereafter no malfunctions appeared. Further, other items were removed in the interest of keeping the survey short and the attrition rate low. All problems were resolved by April 12th, and the data collection ended April 21st.

[1] or taken via https://copensocialscience.fra1.qualtrics.com/jfe/form/SV_1C7RiAvXQKpoa6W?fbclid=IwZXh0bgNhZW0CMTAAAR175pKcWa8fHNKECYupvMaelH7ioOG7NCcWP4OKpKh3wVAY1YR8E2nuB2U_aem_AYbr_ccK6rzX2xaj_QFRXDHfNwNw6A1oGoQzvpCDGy_VZKmCSuBWZmap31d1ivz60axtNriPsVj7gQ82h45gqX-x

A.3 Descriptive results on expectations

Below, I visualize the distribution of expected position by gender, on comparable subsets. The left side shows the difference between genders on the subset of respondents who are on educations with the highest expected average income, where the stark differences in the belief of being part of the top of the income distribution are as pronounced as seen on the full sample. On the right, I only include political science students, who similarly differ in the expectations of being part of the top of the income distribution.

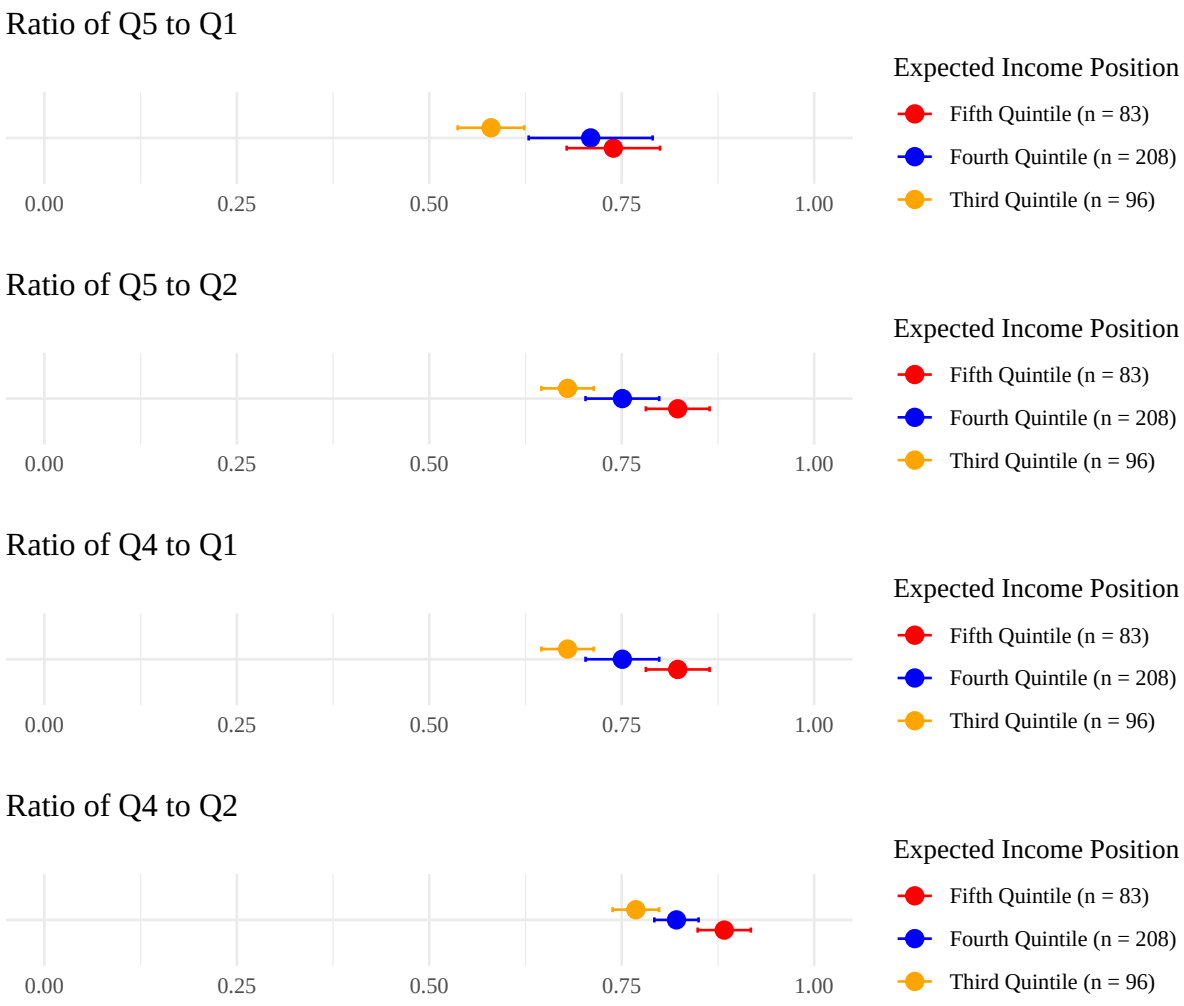
Figure 1: Difference between genders on subsets with comparable characteristics



Note: Confidence intervals are set at the 95% level. Only respondents who fully completed the task of distributing the balls.

As seen in the main analysis, differences in preferences for taxation are not clearly present. However, I visualize the differences in the preferred level of progressivity, by taking the ratio between tax levels on different income groups. A value of 1 would indicate that respondents prefer a flat tax. Here, we see that the difference in preferred levels is consistently different who expects to be in the top, who prefer the least progressive tax regime. The group who expect to be part of the third quintile want the most progressive tax regime, while the group expecting to be in the fourth quintile are placed in between.

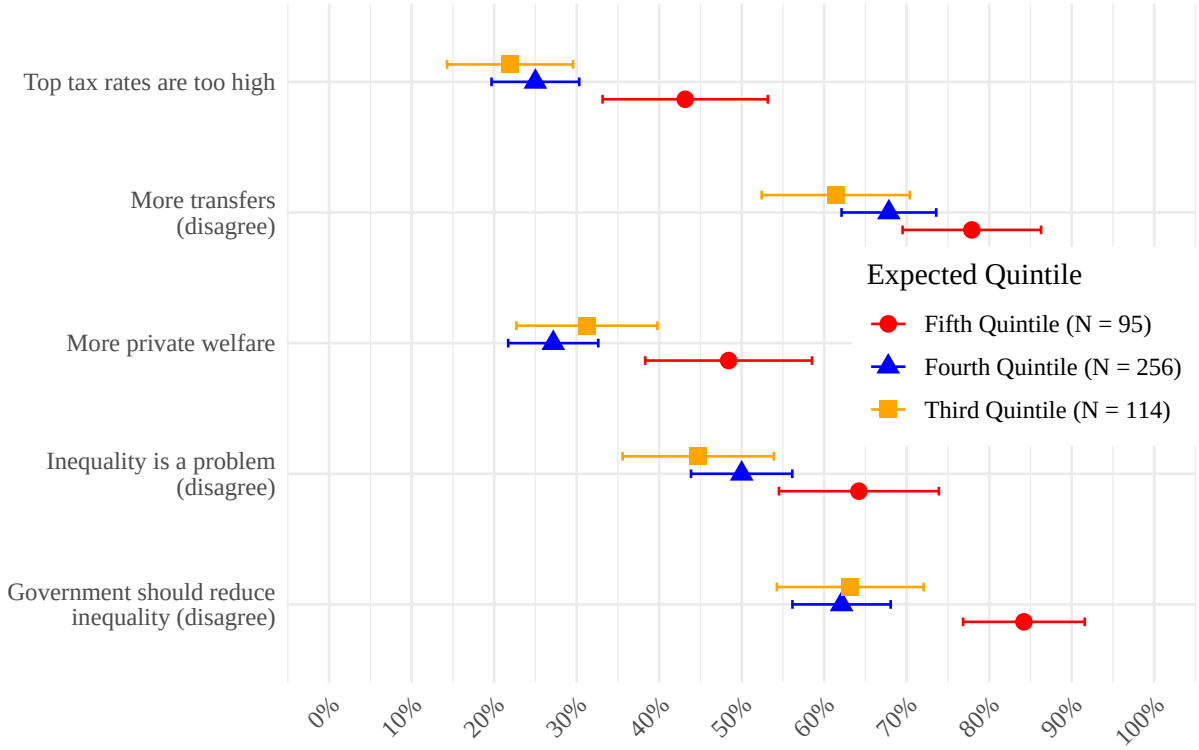
Figure 2: Preferences for taxation progressivity on each income quintile



Note: Confidence intervals are set at the 95% level. The higher the ratio is, the less progressive the preference is. The quintiles in the title refer to the ratio of preferred tax level on the given quintile, and not to the ratio of the different groups in the survey.

On figure 2, I visualize differences in the control condition on all five Likert items which measure redistributive preferences. The pattern of consistent similarity between the third and fourth quintile replicates, while the fifth quintiles overlap with the other groups on some items.

Figure 3: Difference by expected group on individual likert items



Note: Confidence intervals are set at the 95% level. All items are coded in the anti-redistribution direction.

A.4 Robustness of main result

As noted in my balance test, the only variable with a slight imbalance was whether or not respondents lived in the capitol region of Denmark (Region Hovedstaden). To ensure that this is not an issue for the main results on taxation, I construct a dichotomous variable for whether respondents live in the capitol region or not, and add it as a control. It has no significant effect on the main model.

Table 1: Main model with control for Capitol Region (Conditional on whether respondents underestimate their future position)

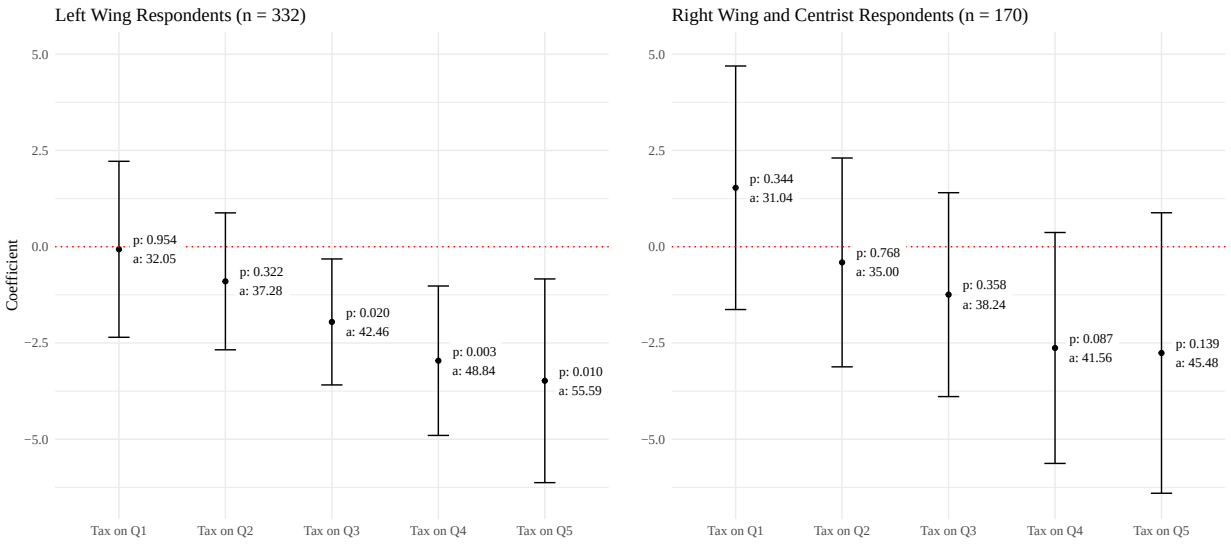
	Dependent variable: Tax Preferences				
	Tax on Q1	Tax on Q2	Tax on Q3	Tax on Q4	Tax on Q5
	(1)	(2)	(3)	(4)	(5)
Treatment (Binary)	0.473	−0.629	−1.498**	−2.471***	−2.639**
	(0.940)	(0.762)	(0.732)	(0.883)	(1.164)
Capitol Region (Binary)	−0.236	−0.439	−0.301	−1.446	−0.265
	(1.302)	(1.046)	(1.137)	(1.284)	(1.693)
Observations	501	502	503	503	509
R^2	0.001	0.002	0.008	0.017	0.010
Adjusted R^2	−0.003	−0.002	0.004	0.014	0.006

Note: *p<0.1; **p<0.05; ***p<0.01. Robust Standard Errors in parenthesis.

A.5 Left-right wing

To whether left-wing respondents are not receptive to the treatment, I divide the sample by their stated ideological beliefs to compare how they react to the treatment. I collect right-wing and centrist respondents together, as there are fewer of them represented in the sample and fewer yet who underestimate their future position. This choice does not have great consequences for my argument, as I am mainly interested in seeing whether left-wing respondents resist the treatment. As shown in figure 5, it is not the case that left-wing respondents refrain from updating their taxation preferences when receiving information on their future income position. These results remain significant. However, the estimates for the right-wing and centrist respondents are insignificant, while the coefficients remain largely the same. This insignificance is partly driven by the relatively small sup-sample size and not necessarily suggestive of the right-wing or centrist respondents not reacting to the treatment.

Figure 4: Treatment Effect on Tax Preferences by Ideology

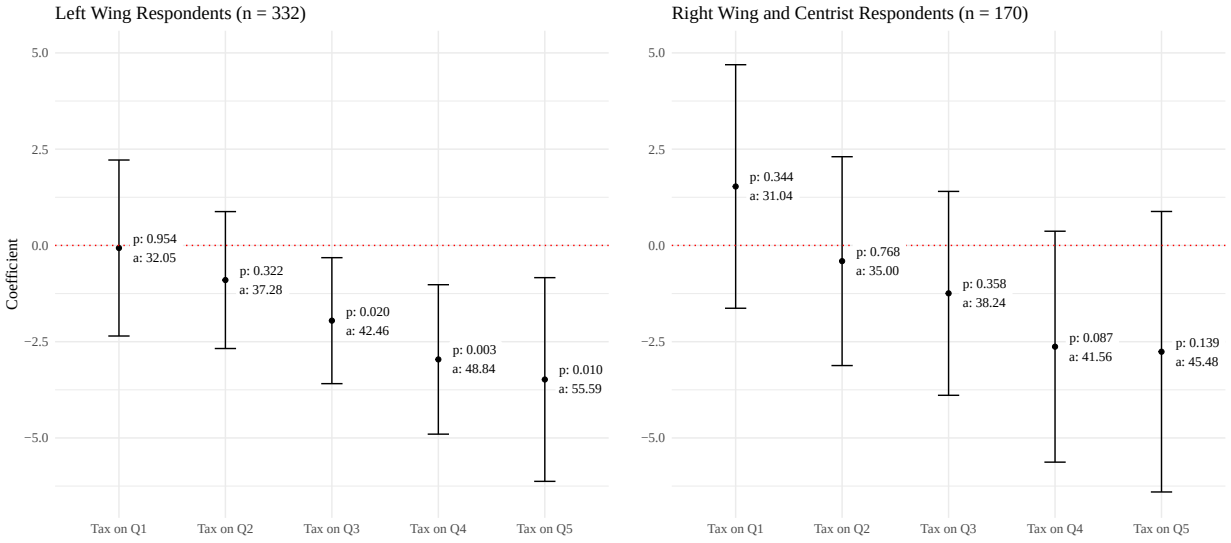


Note: Conditional Average Treatment Effects, solely including respondents who underestimate their future income position and by ideology. The independent variable is the treatment condition, and the dependent variable is preferred tax rate for the given group, which is scaled from 0 to 100. *p* represents the p-value, *c* represents the constant and can be interpreted as the mean preferred tax rate on the given group by the control condition. Confidence intervals are set at the 95% level.

Figure 5 also displays that the two groups vary considerably in their preferred level of taxation. The constant, which displays the mean preferred level of taxation in the con-

trol condition, shows that the preferred tax rate of left-wing respondents for top income earners is at 55%, while it is only at 45% for centrist and right-wing respondents. Despite that the two groups have great differences in their level of preferred tax rates, they move in parallel upon receiving information about their future position. This runs counter to findings and arguments that suggest that respondents only update their political preferences to information that is congruent with their general ideological inclinations (Alesina, Stantcheva, and Teso 2018; Laméris, Garretsen, and Jong-A-Pin 2020; Culpepper, Shandler, Jung, and Lee 2024).

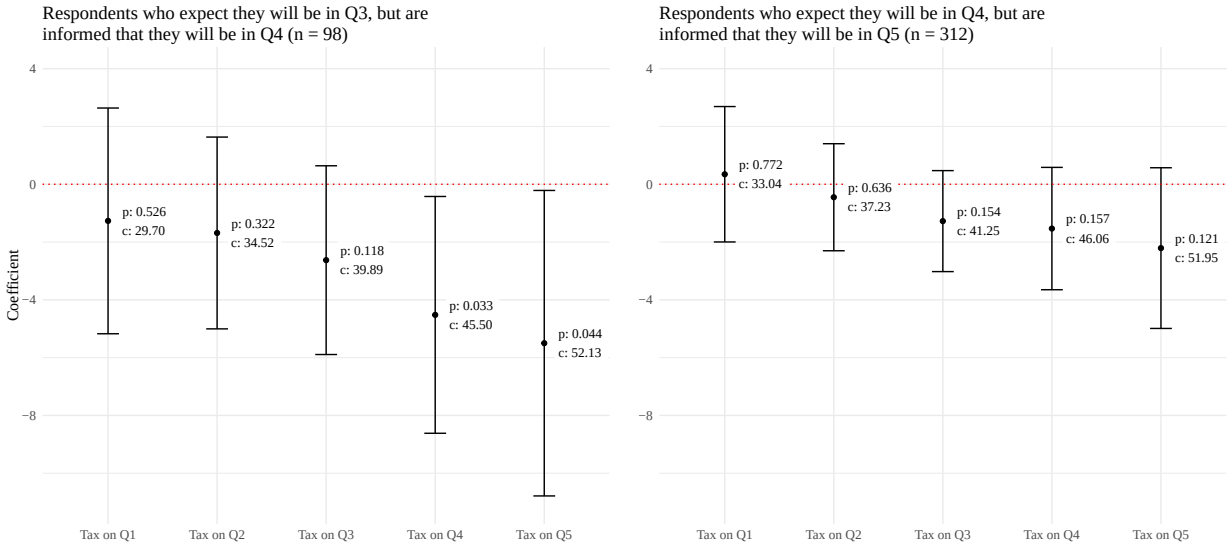
Figure 5: Treatment Effect on Tax Preferences by Ideology



Note: Conditional Average Treatment Effects, solely including respondents who underestimate their future income position and by ideology. The independent variable is the treatment condition, and the dependent variable is preferred tax rate for the given group, which is scaled from 0 to 100. p represents the p-value, c represents the constant and can be interpreted as the mean preferred tax rate on the given group by the control condition. Confidence intervals are set at the 95% level.

While I treat these effects as conditional average treatment effects, there are two sources of heterogeneity in the treatment that are important to address. One is the *strength* of the treatment, meaning whether one has narrowly or widely underestimated one's position. The second is the *level* of the treatment, given that the quintile one is treated with varies by one's education. However, these sources of heterogeneity are limited given the relative homogeneity of the sample, which is reflected in figure **??**. To assess whether these results are sensitive to specifications where the treatment effect is kept constant, I show the effect on a subset of respondents who receive the treatment at the same level and with the same strength. These are displayed in figure 6.

Figure 6: Effect of Binary Treatment on Tax Preferences



Note: Conditional Average Treatment Effects, solely including respondents who underestimate their future income position. The independent variable is the treatment condition, and the dependent variable is preferred tax rate for the given group, which is scaled from 0 to 100. *p* represents the p-value, *c* represents the constant and can be interpreted as the mean preferred tax rate on the given group by the control condition. Confidence intervals are set at the 95% level.

Here, I observe some differences in terms of the strength and significance of the treatment. Respondents who expect to be part of the middle of the income distribution (the third quintile), but then learn that they may be part of the fourth quintile want 4% less taxation on the top groups relative to the control condition. On respondents who expect to be in the fourth quintile, but then learn that they will be part of the top of the income distribution, information likewise leads respondents to prefer less taxation, but results are rendered insignificant. One explanation could be that the difference in levels is driving

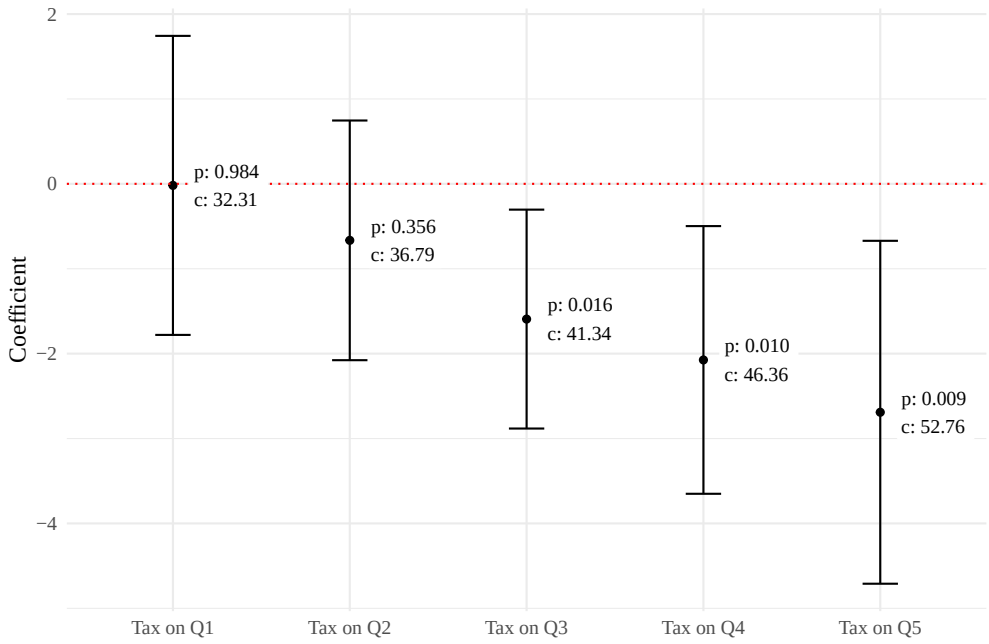
this effect. That is, the group that expects to be in the middle of the income distribution suddenly learns that they will achieve above-average earnings. This information is qualitatively different than learning that one will progress from the fourth to fifth bracket in the income distribution. Therefore, the difference in treatment levels makes the information more consequential for the respondent. Another explanation could be that there are varying levels of knowledge of political issues and income distributions between the two groups. As discussed in section **??**, the better respondents are informed, the less likely they are to react to the information. The group that can expect to be part of the top of income distribution stands particularly out, as these respondents predominantly are political science and economics students. These two groups arguably have stronger prior beliefs on politics and where they will end in the income distribution relative to others. Due to the limited sample size, I cannot draw strong conclusions on whether this is the case by dividing the sample further into small groups, where more observable characteristics are kept constant. In Appendix A.5, I further test whether extreme observations due to the granular measure affect the main results. I do not find that excluding extreme observations affects the results significantly. On the contrary, it renders the estimates more significant.

A.5.1 Assessing the influence of extreme observations

Due to the continuous nature of the taxation measure, one concern can be that the effect is driven by extreme observations, which bias the average. On figure **??**, I visualize the distribution of taxation preferences across the five tax items. As one can see, there are extreme values in the distribution, where some respondents want either a 0% or a 100% tax rate. It is unclear whether one should remove these values. On the one hand, these responses could indicate that respondents responded without the proper attention for the item. On the other hand, these could represent respondents true attitudes, and simply express that the respondent has extreme taxation preferences. To address this concern, I remove respondents who answer either 0 or 100, to assess the robustness of the main model. This is presented on figure 7.

Below, we see the main model run anew, without the extreme values. Here, we actually see that the result becomes more significant than in the original model. My main results are therefore not significantly different by removing extreme observations, and concerns on how influential these few observations are alleviated.

Figure 7: Main estimates excluding extreme values

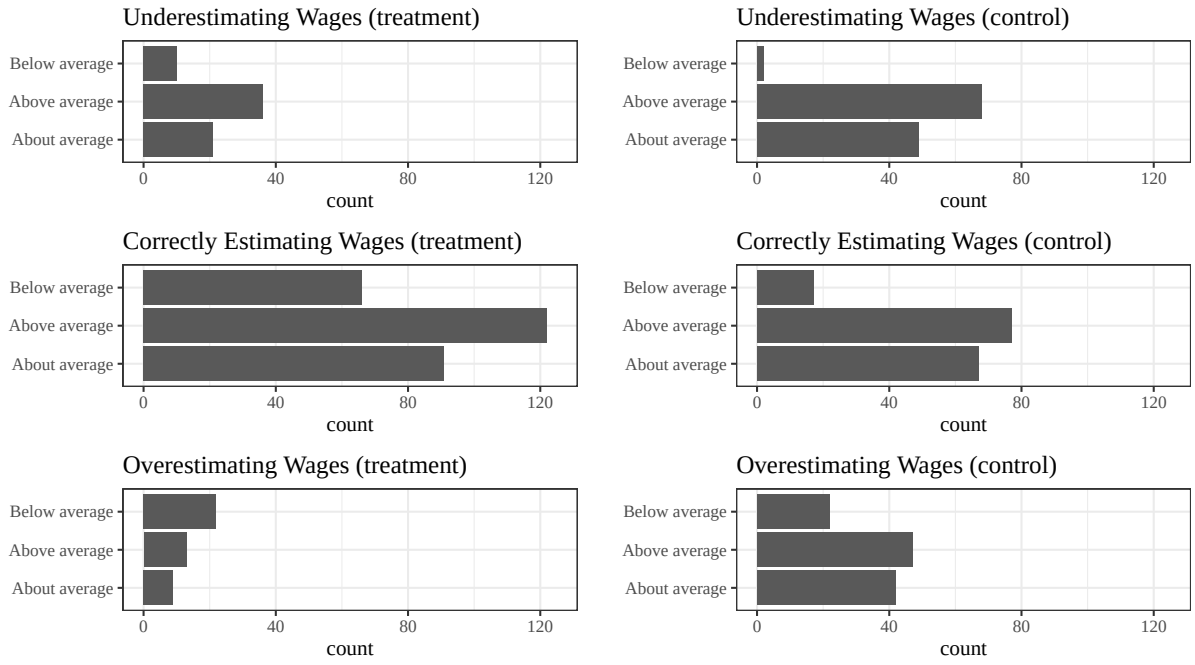


Note: Confidence intervals are set at the 95% level. Conditional Average Treatment Effect on respondents who underestimate their future position. Observations: 495

A.6 Treatment assessment

To evaluate to what extent respondents either could recall or where aware of the income information, I asked both the control condition and the treatment what the average future income of graduates with their degree. To start with the control condition, the logic is first to assess whether respondents are aware of the income information, and then how they rate their personal prospects relative to this information. On the right side of 9, we see that respondents across groups believe that they will earn a higher wage than what they believe the average wage to be. As respondents are uninformed, this expresses their guess. On the left side, where I see whether respondents can recall the information, most respondents who recall the wage information correctly also believe that they will earn above average wages.

Figure 8: Income confidence by estimated wage



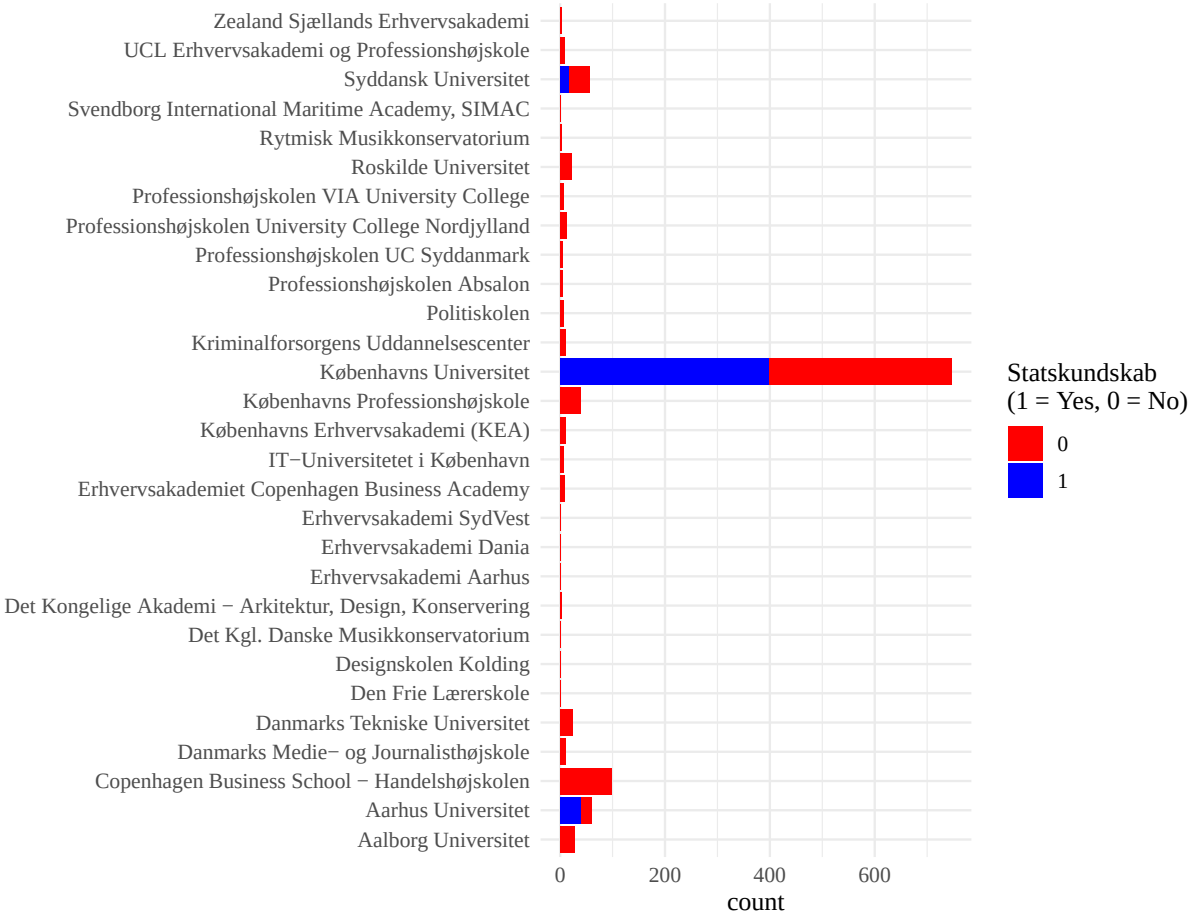
While interesting descriptively, it is difficult to infer from these estimates whether respondents updated their beliefs about where they would be in the income distribution. Given that this surveys beliefs about absolute income, the bias I describe in section 5.3 to estimate income correctly, but underestimate position, persist. Ex post, it could have been desirable to have an item which more directly measured whether relative beliefs where updated. However, this variable would have been affected by the prior elicitation of where

respondents believed they would be placed in society, and would have presented its own limitations.

A.7 Distribution of Respondents by Institution and Degree

Below, I visualize the distribution of respondents by educational institutions. As one can see, respondents predominantly study at the University of Copenhagen (Københavns Universitet), and students who study political science (statskundskab) are heavily represented.

Figure 9: Distribution of Institutions



B Full questionnaire (English)

Demographics

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1. Are you currently pursuing higher education in Denmark?
    - Yes
    - No
2. What is your gender?
    - Male
    - Female
    - Other
    - Prefer not to disclose
3. How old are you?
    - 22 or younger
    - 23-26
    - 27-30
    - 31-34
    - 34 or older
4. Which region do you live in?
    - North Jutland Region
    - Central Jutland Region
    - Southern Denmark Region
    - Zealand Region
    - Capital Region of Denmark

What education are you pursuing?

- Type of Tertiary Education (dropdown)
- Institution (dropdown)
- Degree type at the institution (dropdown)

Explanation of Balls in Bins tasks

On the next page, you will be asked to complete a short exercise. Here, you will indicate where you believe you will be in the income distribution in the future.
In the exercise, you will place 20 balls. Each ball represents a 5% probability that you will fall into that income group.
Income distribution refers to where you think you will be in terms of salary compared to other adult Danes.

- I have read the above text - click to continue

Expectations (Balls in Bins) Imagine you have been in the labor market for 10 years after completing your education. Where do you think you will be in the income distribution? Place all 20 balls by clicking on the categories to show where you think you will end up. If you want to remove a ball, you can click on it.

- Top 20%
- Second highest 20%
- Middle 20%
- Second lowest 20%
- Lowest 20%

Expectations - 5-point scale, if respondent did not distribute all 20 balls
You did not distribute enough balls to clearly express your expectations.
Imagine again that you have been in the labor market for 10 years after completing your education. Where do you think you will be in the income distribution?

- Top 20%
- Second highest 20%
- Middle 20%
- Second lowest 20%
- Lowest 20%

Political Beliefs

1. In political matters, people talk about being "left-wing" or "right-wing". What best describes your political stance?
    - Left-wing

- Center-left
- Center
- Center-right
- Right-wing

2. Which party did you vote for in the parliamentary election on November 1, 2022?
    - A. Social Democrats
    - B. Social Liberal Party
    - C. Conservative People's Party
    - D. New Right
    - F. Socialist People's Party
    - I. Liberal Alliance
    - K. Christian Democrats
    - M. The Moderates
    - O. Danish People's Party
    - Q. Free Greens
    - V. Venstre, Denmark's Liberal Party
    - Æ. Denmark Democrats - Inger Støjberg
    - Ø. Red-Green Alliance
    - Å. The Alternative
    - Other party/Independent candidate
    - Did not vote
    - Blank vote
    - Did not have the right to vote
    - Prefer not to answer
    - Don't remember

Treatment (shown randomly to half of the sample)
You indicated that you are studying [*chosen degree*] at [*chosen institution*]. The income for the average student 10 years after entering the labor market is [*average wage for chosen degree*] kroner per month (before taxes, including pension).
With that income, you will be among the [XX% richest/poorest] in Denmark. This means that [XX% of the population would have a higher/lower income than you].

- I have read the above text - click to continue

Placebo (shown randomly to half of the sample)
You indicated that you are studying [*chosen degree*] at [*chosen institution*].

- I have read the above text - click to continue

Outcome brief You will now be asked a series of questions about Danish conditions.
If there are questions you do not have an opinion on or do not wish to answer, you can move on. Even if some questions are difficult to answer, please provide your best estimate.

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1. Economic inequality is a big problem in Denmark
    - Strongly agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly disagree
2. The government should raise taxes and transfers to reduce income disparities between the rich and the poor in Denmark
    - Strongly agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly disagree
3. The top tax rate is too high in Denmark
    - Strongly agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly disagree
4. There should be more opportunities to purchase welfare services privately in Denmark
    - Strongly agree
    - Agree
    - Neither agree nor disagree

- Disagree
- Strongly disagree

5. The social assistance benefits should be increased in Denmark
    - Strongly agree
    - Agree
    - Neither agree nor disagree
    - Disagree
    - Strongly disagree

Meritocracy

1. Is luck or personal effort most important in determining whether one becomes rich or poor in Denmark?
    - Luck is most important
    - Luck is somewhat more important
    - Equal parts luck and effort
    - Personal effort is somewhat more important
    - Personal effort is most important

Economic effiency vs. equality
In political decisions, one often has to balance between growth and equality. Which is more important to you?
Choose on the scale where '1' is economic equality, and '10' is economic growth.

- 1: Economic equality is most important
- (Option 2 to 9)
- 10: Economic growth is most important

Tax Rates: Slider
If you could freely choose, how much do you think different income groups should pay in taxes? Drag the slider to show where you think the tax rate should be.

- Top 20% income (Tax rate set on slider from 0 to 100%)
- Second highest 20% income (Tax rate set on slider from 0 to 100%)

- Middle 20% income (Tax rate set on slider from 0 to 100%)
- Second lowest 20% income (Tax rate set on slider from 0 to 100%)
- Lowest 20% income (Tax rate set on slider from 0 to 100%)

Treatment Check
Earlier in this survey, you were informed about what the average student [*chosen degree*] at [*chosen institution*] earns per month 10 years after entering the labor market (before taxes, including pension).
Do you remember what one could approximately expect to earn? Indicate the figure that is closest to what you remember.

- 10,000 DKK
- 20,000 DKK
- 30,000 DKK
- 40,000 DKK
- 50,000 DKK
- 60,000 DKK
- 70,000 DKK
- 80,000 DKK
- 90,000 DKK
- 100,000 DKK or more per month

You indicated that the average student from [*chosen degree*] at [*chosen institution*] earns about [*answer selected above*] per month 10 years after entering the labor market. Do you think that you will earn:

- Much more than [*selected answer*] per month (before taxes, including pension)
- Slightly more than [*selected answer*] per month (before taxes, including pension)
- About [*selected answer*] per month (before taxes, including pension)
- Slightly less than [*selected answer*] per month (before taxes, including pension)
- Much less than [*selected answer*] per month (before taxes, including pension)
- Don't know

After 10 years in the labor market, do you think you will work in the private or public sector?

- I will definitely work in the private sector

- I will probably work in the private sector
- There is an equal chance that I will work in the private or public sector
- I will probably work in the public sector
- I will definitely work in the public sector

Placebo Check At the beginning of this survey, you were asked to indicate your best estimate of where you will be in the income distribution in 10 years. Here at the end, there are some follow-up questions about your income prospects.
Give your best estimate of what the average student from [*chosen education*] at [*chosen institution*] earns per month after 10 years (before taxes, including pension):

- 10,000 DKK
- 20,000 DKK
- 30,000 DKK
- 40,000 DKK
- 50,000 DKK
- 60,000 DKK
- 70,000 DKK
- 80,000 DKK
- 90,000 DKK
- 100,000 DKK or more per month

You indicated that the average student from [*chosen degree*] at [*chosen institution*] earns about [*answer selected above*] per month 10 years after entering the labor market. Do you think that you will earn:

- Much more than [*selected answer*] per month (before taxes, including pension)
- Slightly more than [*selected answer*] per month (before taxes, including pension)
- About [*selected answer*] per month (before taxes, including pension)
- Slightly less than [*selected answer*] per month (before taxes, including pension)
- Much less than [*selected answer*] per month (before taxes, including pension)
- Don't know

After 10 years in the labor market, do you think you will work in the private or public sector?

- I will definitely work in the private sector

- I will probably work in the private sector
- There is an equal chance that I will work in the private or public sector
- I will probably work in the public sector
- I will definitely work in the public sector

Thank you for your participation!

Thank you very much for participating in my survey! I greatly appreciate it. The information you have been shown in this survey about education and income is based on data from Statistics Denmark, the Economic Council of the Labour Movement, and Uddannelseszoom.dk.

If you are interested in a guide to applying for scholarships, writing the methodology section, or applying for a PhD in the USA, you will be taken to a page where you can anonymously provide your email after choosing an option. The guides will be sent out when the data collection is complete, which will be around April 25.

Thanks again for your participation - and send an email to kbz724@ifs.ku.dk if you have any comments or questions!

- Scholarship guide
- How to apply for a PhD in the USA
- How to write your methodology section
- Nothing needed - questionnaire completed out of interest

References

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