

Supplemental Appendix for

The Asymmetric Incidence of Business Taxes: Survey Evidence from German Firms

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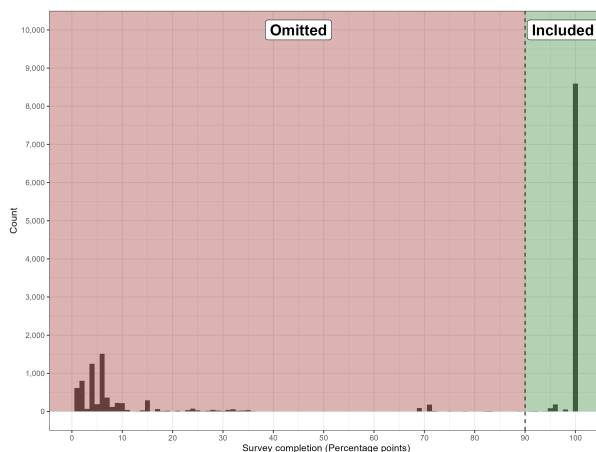
A. Additional Figures and Tables

A.1. Completion Rate

Figure A1 illustrates the completion rates of survey respondents. Responses with a completion rate below 90% (shaded in red) are excluded from the analysis, while all responses meeting or exceeding the 90% threshold ($N = 8,955$) are retained (shaded in green). The final sample used in the main analysis ($N = 6,749$) consists of these high-completion responses, further refined to exclude observations with missing values for control and weighting variables.

To evaluate whether firms in our final survey sample ($N = 6,749$) – those with a completion rate of at least 90% and non-missing values for control and weighting variables – differ systematically in key financial characteristics, Section A.6 in the Supplemental Appendix presents a balance table comparing their financial profiles (as recorded in Orbis) with those of German firms in the Orbis database that either did not participate or did not complete the survey (i.e., non-participants). The analysis finds no significant differences in key financial metrics between firms in our final survey sample and non-participants, suggesting that firms that completed the survey are not systematically different in their financial characteristics from those excluded from our sample.

Figure A1: Completion Rate



Note: Figure A1 depicts the distribution of the progress at which the respondent finished the survey. Responses that fall in the shaded red area are excluded from the survey.

A.2. Screenshots of Original Survey Questions

A.2.1. Tax Decrease Treatments

Question:

*Assume that your company has a (1%/10%/25%) **permanently lower profit tax burden** as a result of a tax decrease. How do you distribute the additional funds? Please enter shares that add up to 100.*

Answer Options:

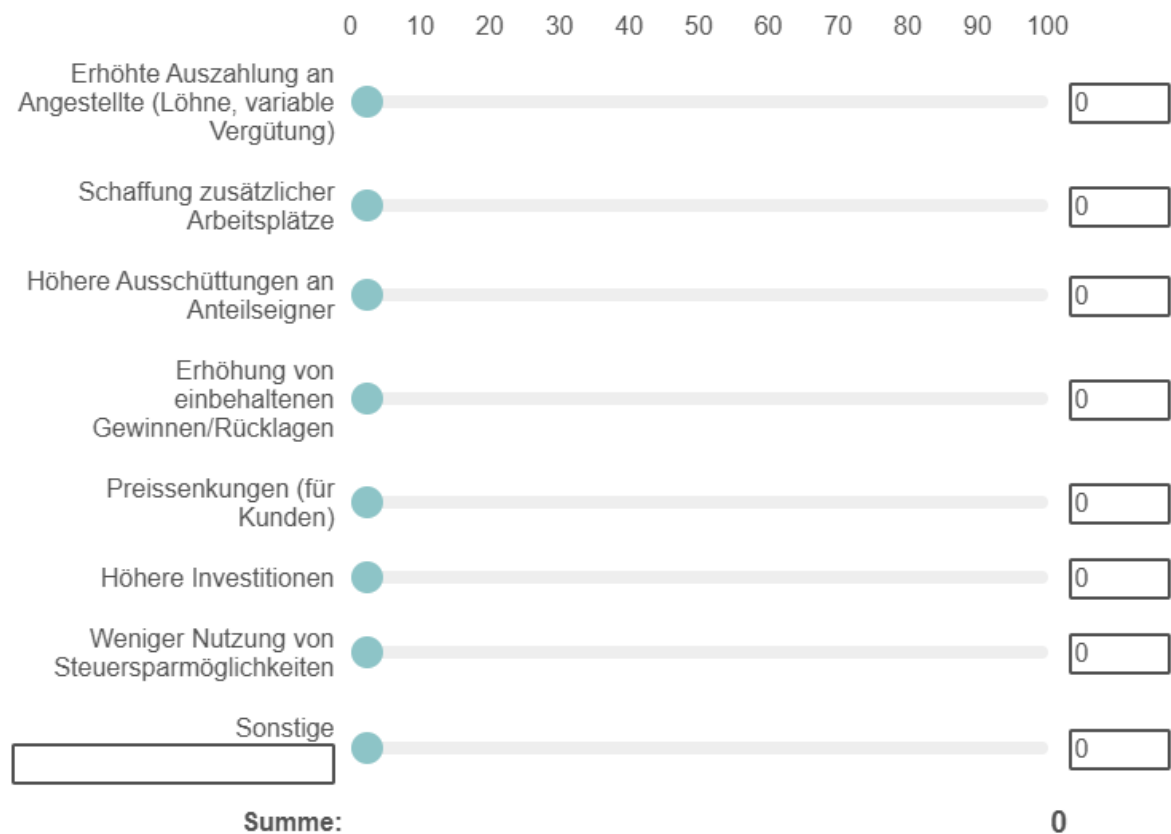
- Increased payment to employees
- Creation of additional jobs
- Higher distributions to partners (for non-corporations)
- Higher distributions to shareholders (for corporations)
- Increase in retained earnings/reserves
- Price reductions (for customers)
- Higher investments
- Less use of tax saving opportunities
- Others

Figure A2: Example Survey Question Tax Decrease Treatment - 1%

Nehmen Sie an: Ihr Unternehmen hat durch eine Steuersenkung eine um **1% dauerhaft niedrigere Gewinnsteuerbelastung**.

Wie verteilen Sie die zusätzlichen Mittel?

Bitte geben Sie Anteile an, die in der Summe 100 ergeben.



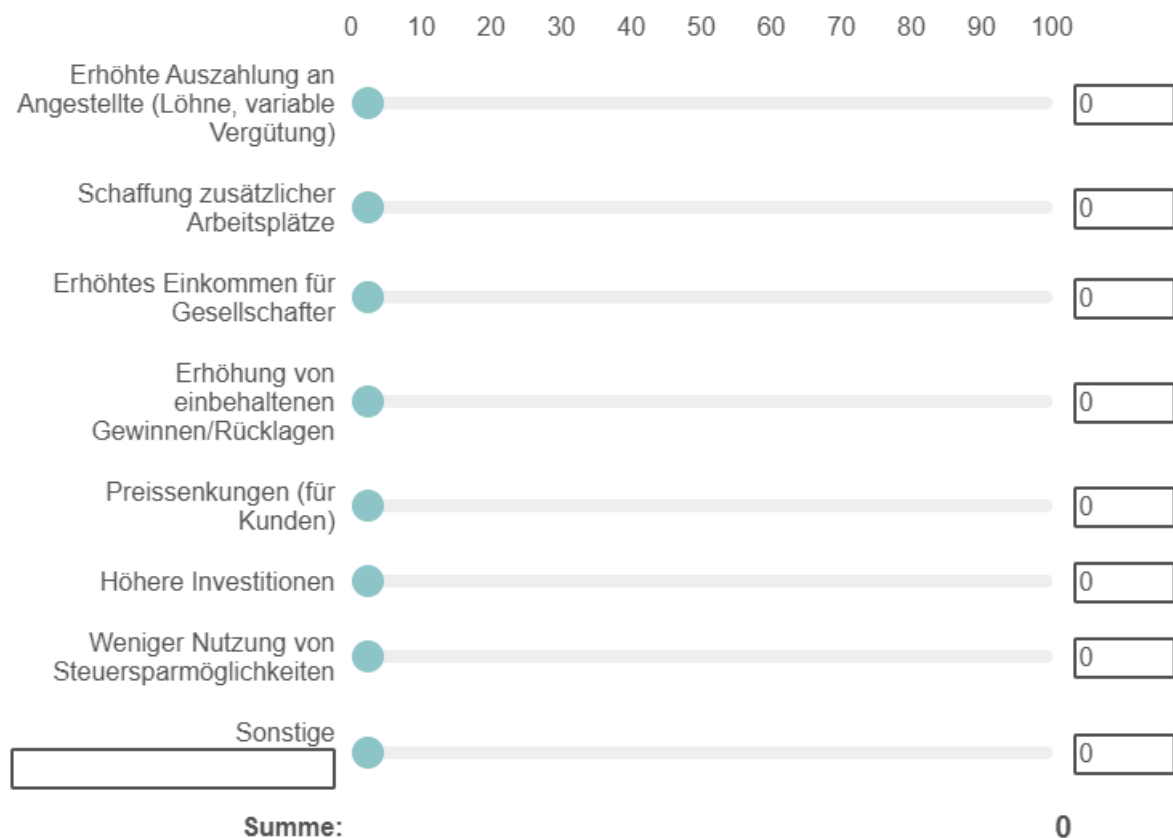
Note: Figure A2 shows an example of the tax decrease (1%) survey experiment as appearing in the web survey of the GBP. After the hypothetical treatment (“Assume that your company has a (1%/10%/25%) **permanently lower profit tax burden** as a result of a tax decrease. How do you distribute the additional funds?”), the respondent was asked how the additional funds would be distributed and notified that entered shares must add up to 100. The respondent then could attribute shares to the categories listed in Table 1 either via adjusting the sliders or entering them directly in the boxes to the right. Shares were initially set to zero for all categories.

Figure A3: Example Survey Question Tax Decrease Treatment - 10%

Nehmen Sie an: Ihr Unternehmen hat durch eine Steuersenkung eine um **10% dauerhaft niedrigere Gewinnsteuerbelastung**.

Wie verteilen Sie die zusätzlichen Mittel?

Bitte geben Sie Anteile an, die in der Summe 100 ergeben.



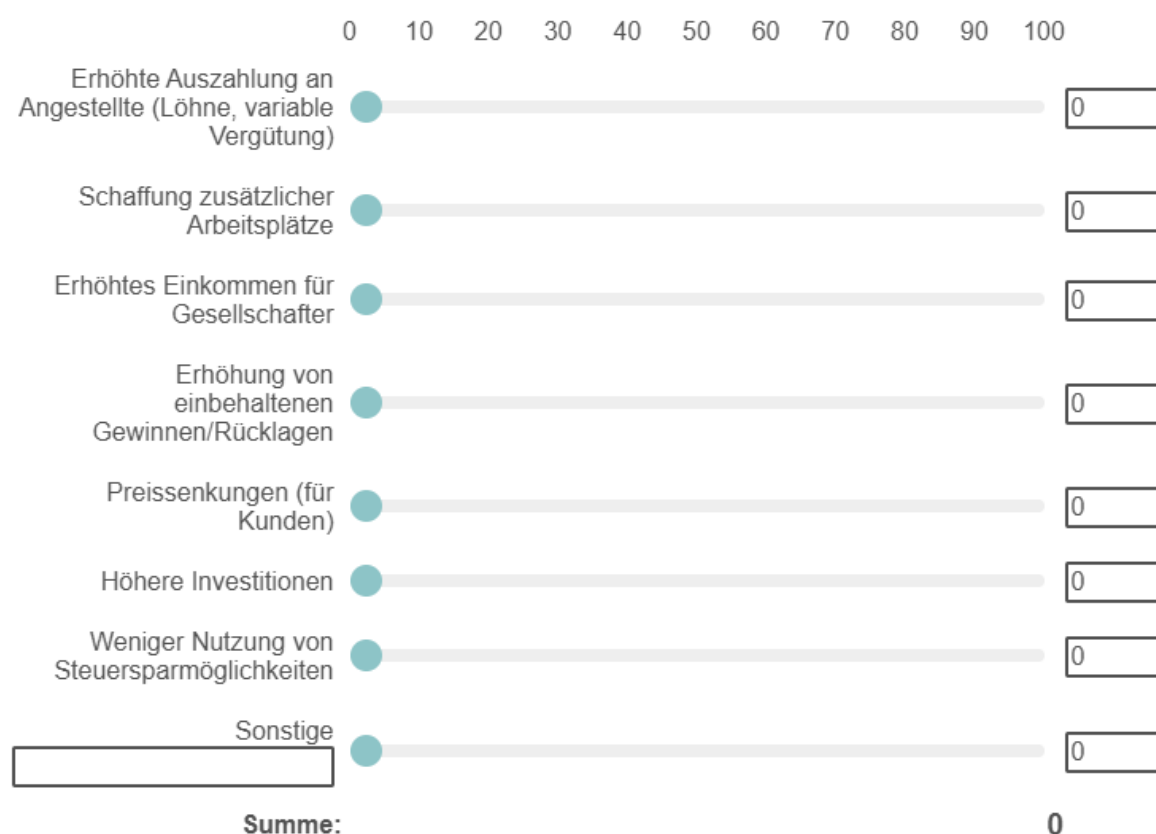
*Note: Figure A3 shows an example of the tax decrease (10%) survey experiment as appearing in the web survey of the GBP. After the hypothetical treatment (“Assume that your company has a (1%/10%/25%) **permanently lower profit tax burden** as a result of a tax decrease. How do you distribute the additional funds?”), the respondent was asked how the additional funds would be distributed and notified that entered shares must add up to 100. The respondent then could attribute shares to the categories listed in Table 1 either via adjusting the sliders or entering them directly in the boxes to the right. Shares were initially set to zero for all categories.*

Figure A4: Example Survey Question Tax Decrease Treatment - 25%

Nehmen Sie an: Ihr Unternehmen hat durch eine Steuersenkung eine um **25% dauerhaft niedrigere Gewinnsteuerbelastung**.

Wie verteilen Sie die zusätzlichen Mittel?

Bitte geben Sie Anteile an, die in der Summe 100 ergeben.



Note: Figure A4 shows an example of the tax decrease (25%) survey experiment as appearing in the web survey of the GBP. After the hypothetical treatment (“Assume that your company has a (1%/10%/25%) **permanently lower profit tax burden** as a result of a tax decrease. How do you distribute the additional funds?”), the respondent was asked how the additional funds would be distributed and notified that entered shares must add up to 100. The respondent then could attribute shares to the categories listed in Table 1 either via adjusting the sliders or entering them directly in the boxes to the right. Shares were initially set to zero for all categories.

A.2.2. Tax Increase Treatments

Question:

*Assume that your company has a (1%/10%/25%) **permanently higher profit tax burden** as a result of a tax increase. How do you finance the additional burden? Please enter shares that add up to 100.*

Answer Options:

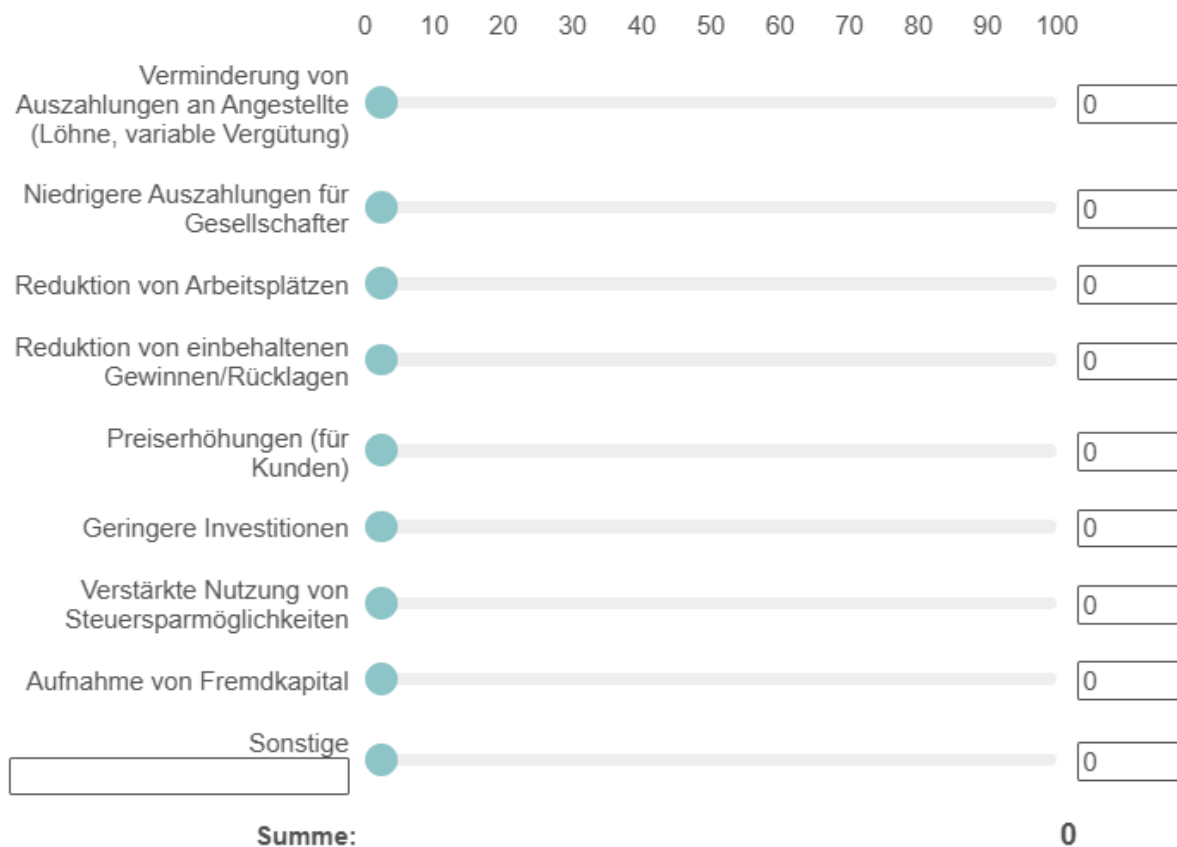
- Decreased payment to employees
- Lower distributions to partners (for non-corporations)
- Lower distributions to shareholders (for corporations)
- Reduction of jobs
- Decrease in retained earnings/reserves
- Price increases (for customers)
- Lower investments
- More use of tax saving opportunities
- Increase in Debt Capital
- Others

Figure A5: Example Survey Question Tax Increase Treatment - 1%

Nehmen Sie an: Ihr Unternehmen hat durch eine Steuererhöhung eine um **1% dauerhaft höhere Gewinnsteuerbelastung**.

Aus welchen Bereichen finanzieren Sie die zusätzliche Steuerlast?

Bitte geben Sie Anteile an, die in der Summe 100 ergeben.



Note: Figure A5 shows an example of the tax increase (1%) survey experiment as appearing in the web survey of the GBP. After the hypothetical treatment (“Assume that your company has a (1%/10%/25%) **permanently higher profit tax burden** as a result of a tax increase. How do you finance the additional burden?”), the respondent was asked how the additional funds would be distributed and notified that entered shares must add up to 100. The respondent then could attribute shares to the categories listed in Table 1 either via adjusting the sliders or entering them directly in the boxes to the right. Shares were initially set to zero for all categories.

Figure A6: Example Survey Question Tax Increase Treatment - 10%

Nehmen Sie an: Ihr Unternehmen hat durch eine Steuererhöhung eine um **10% dauerhaft höhere Gewinnsteuerbelastung**.

Aus welchen Bereichen finanzieren Sie die zusätzliche Steuerlast?

Bitte geben Sie Anteile an, die in der Summe 100 ergeben.



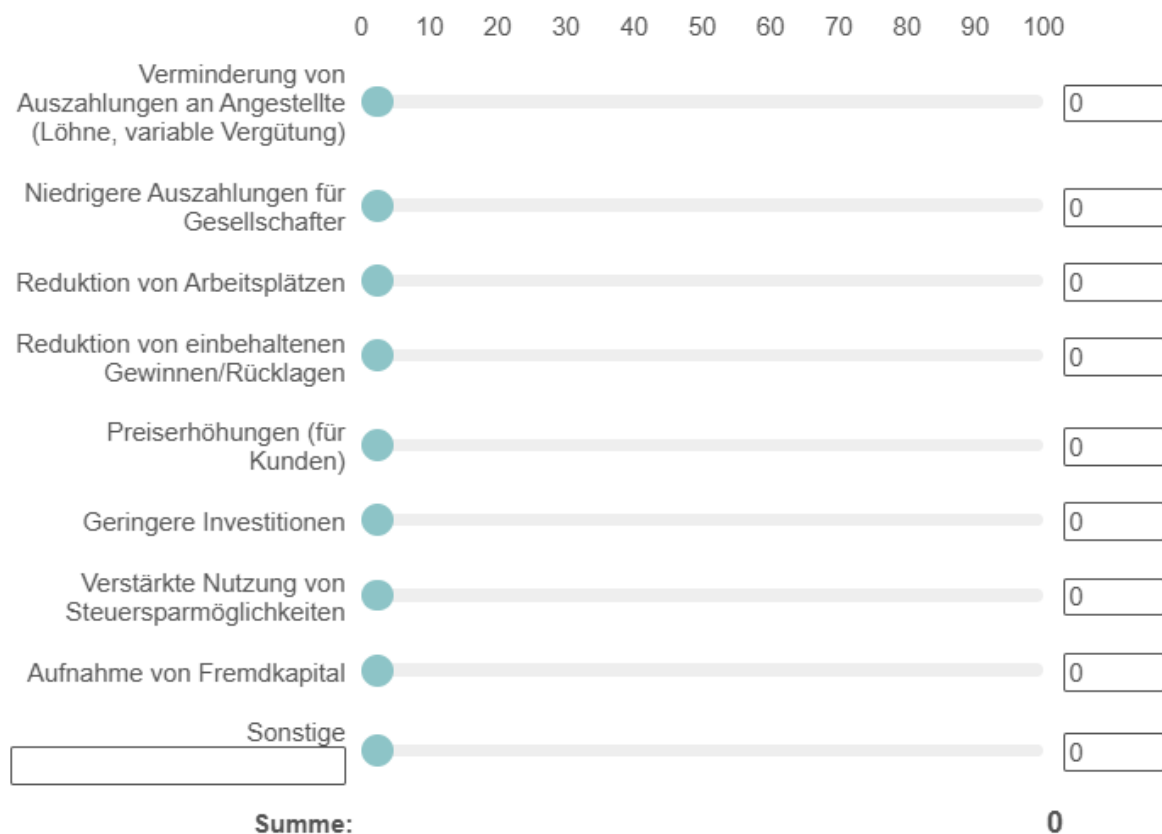
Note: Figure A6 shows an example of the tax increase (10%) survey experiment as appearing in the web survey of the GBP. After the hypothetical treatment (“Assume that your company has a (1%/10%/25%) **permanently higher profit tax burden** as a result of a tax increase. How do you finance the additional burden?”), the respondent was asked how the additional funds would be distributed and notified that entered shares must add up to 100. The respondent then could attribute shares to the categories listed in Table 1 either via adjusting the sliders or entering them directly in the boxes to the right. Shares were initially set to zero for all categories.

Figure A7: Example Survey Question Tax Increase Treatment - 25%

Nehmen Sie an: Ihr Unternehmen hat durch eine Steuererhöhung eine um **25% dauerhaft höhere Gewinnsteuerbelastung**.

Aus welchen Bereichen finanzieren Sie die zusätzliche Steuerlast?

Bitte geben Sie Anteile an, die in der Summe 100 ergeben.



Note: Figure A7 shows an example of the tax increase (25%) survey experiment as appearing in the web survey of the GBP. After the hypothetical treatment (“Assume that your company has a (1%/10%/25%) **permanently higher profit tax burden** as a result of a tax increase. How do you finance the additional burden?”), the respondent was asked how the additional funds would be distributed and notified that entered shares must add up to 100. The respondent then could attribute shares to the categories listed in Table 1 either via adjusting the sliders or entering them directly in the boxes to the right. Shares were initially set to zero for all categories.

A.2.3. Reasons for Change in Investment - Tax Decrease Treatments

Question:

Why would you invest more after a tax cut? Which of the following two reasons plays a greater role for you?

Answer Options - Slider: [0,100]

- 0: After the tax cut, more funds are available.
- 100: After the tax cut, the investment is more worthwhile.

Figure A8: Example Survey Question Reasons for Change in Investment - Tax Decrease

Warum würden Sie nach einer Steuersenkung mehr investieren? Welcher der zwei folgenden Gründe spielt für Sie eine größere Rolle:

Nach der Steuersenkung ist mehr Geld zum Investieren vorhanden.

0

50

Nach der Steuersenkung lohnt sich die Investition mehr.

100

☐ Weiß nicht



Note: Figure A8 shows an example of the question eliciting the reasons for a substantial change in investment due to a tax change for the tax decrease treatment. **If the respondent had entered a share of at least 5 percent for the investment category, she was asked a follow-up question about the reason for this choice.** She could adjust the slider from 0 to 100, where a value of 0 indicates that more funds would be available after the tax decrease, and a value of 100 that the investment is more worthwhile after the tax decrease.

A.2.4. Reasons for Change in Investment - Tax Increase Treatments

Question:

Why would you invest less after a tax increase? Which of the following two reasons plays a greater role for you?

Answer Options - Slider: [0,100]

- 0: After the tax increase, there is less money to invest.
- 100: After the tax increase, the investment is less worthwhile.

Figure A9: Example Survey Question Reasons for Change in Investment - Tax Increase

Warum würden Sie nach einer Steuererhöhung weniger investieren? Welcher der zwei folgenden Gründe spielt für Sie eine größere Rolle:

Nach der Steuererhöhung ist weniger Geld zum
Investieren vorhanden.

0

50

Nach der Steuererhöhung lohnt sich die
Investition weniger.

100

☐ Weiß nicht

Note: Figure A9 shows an example of the question eliciting the reasons for a substantial change in investment due to a tax change for the tax increase treatment. **If the respondent had entered a share of at least 5 percent for the investment category, she was asked a follow-up question about the reason for this choice.** She could adjust the slider from 0 to 100, where a value of 0 indicates that there is less money to invest after the tax increase, and a value of 100 that the investment is less worthwhile after the tax increase.

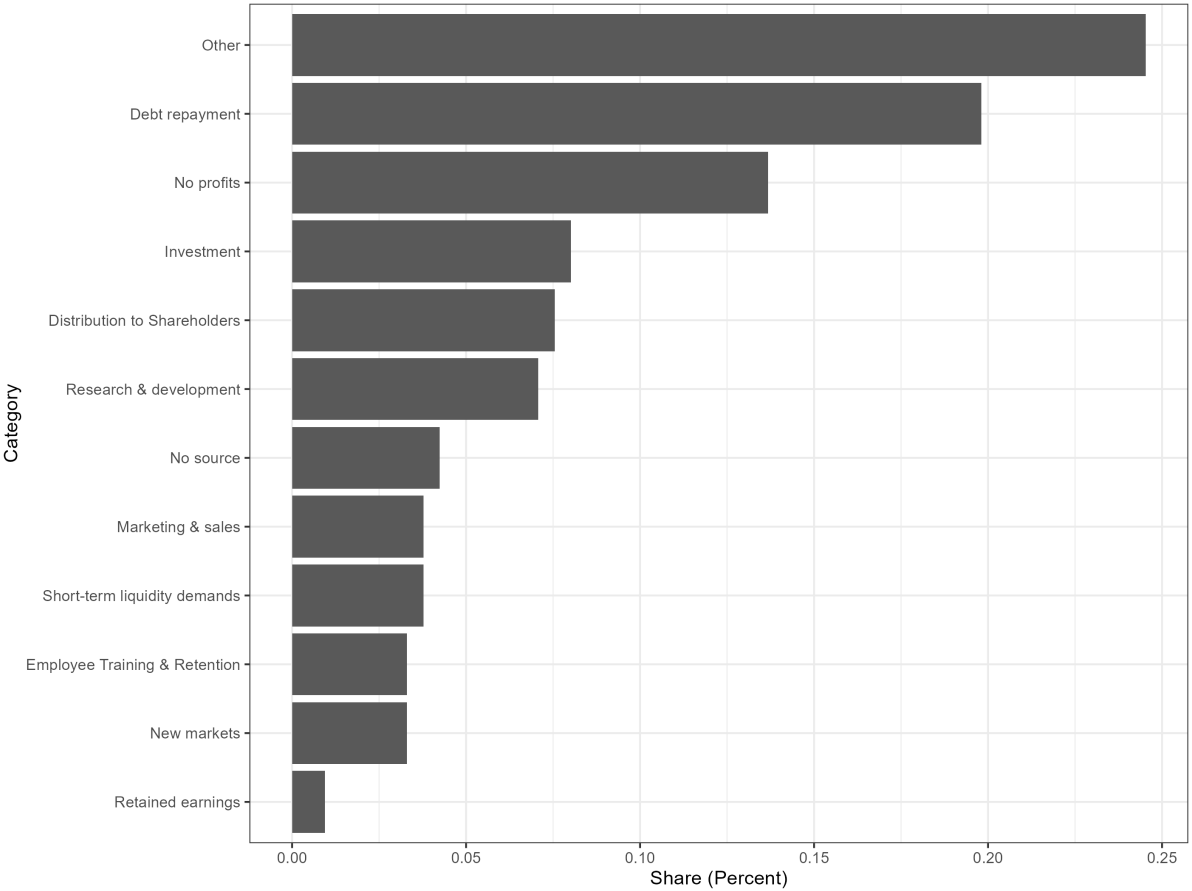
A.3. Text Entries - Other Category

After receiving the randomized tax decrease and increase treatments, participating firms selected from a comprehensive list of adjustment categories, detailed in Section 2.2 and Supplemental Appendix A.2. Firms could allocate shares to each category either by adjusting the slider next to the respective option or by entering values directly in the input boxes on the far right. All entered shares had to be non-negative and sum to 100%. In addition to predefined adjustment margins – including wages, employment, distributed profits, retained earnings or reserves, consumer prices, investments, and tax-saving strategies – firms also had the option to select an *Others* category.

The *Others* category was included to ensure that no relevant incidence category was overlooked. If respondents allocated a positive share to this category, they were prompted to provide a free-text response specifying the missing category or categories. Figures A10 and A11 illustrate the text responses given in the *Others* category for the tax decrease and tax increase treatments, respectively.

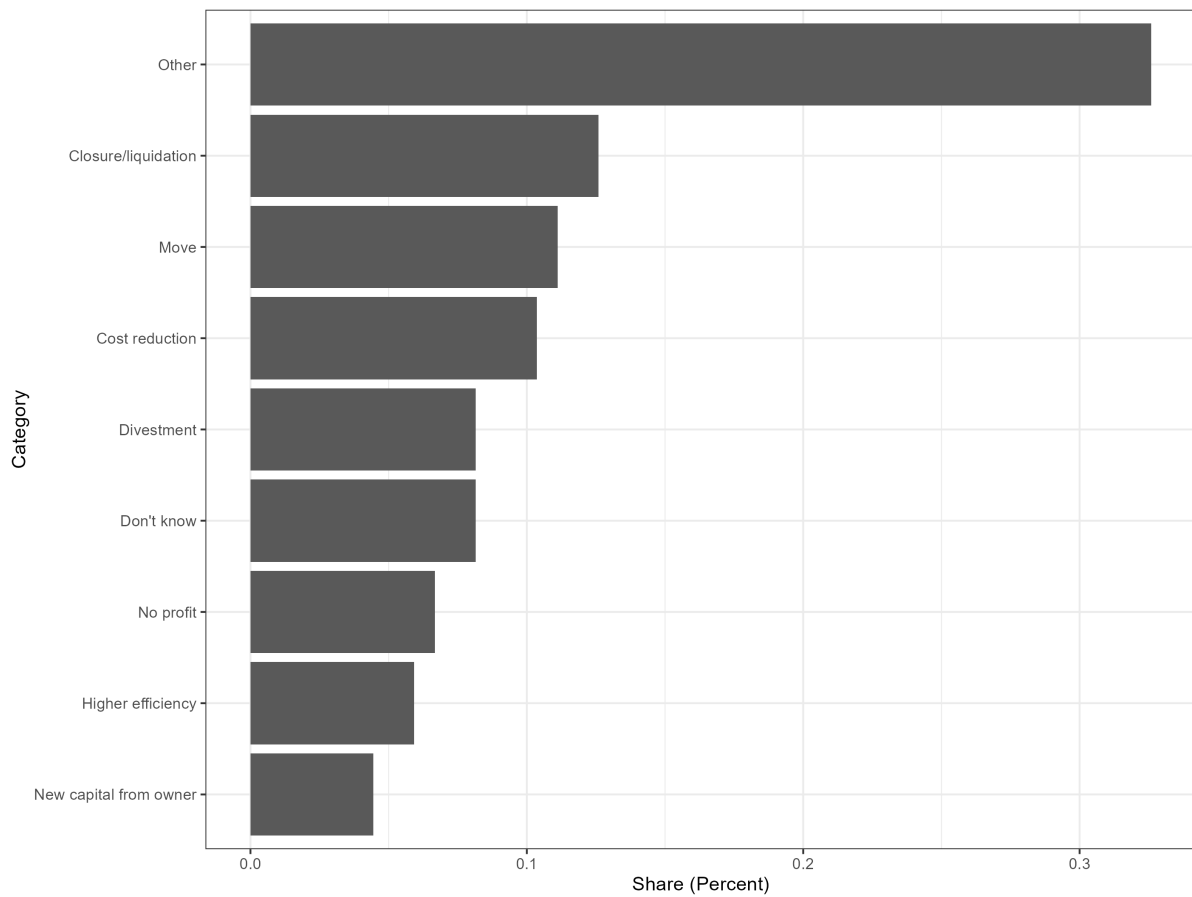
For the **tax decrease treatment**, the most frequently mentioned missing category appears to be the use of additional funds for debt repayment, as indicated by terms such as liabilities (Verbindlichkeiten), repayment (Rückzahlung), and loans (Kredite, Darlehen). Additionally, some firms noted that they were not generating profits, making a reduction in the profit tax burden irrelevant. In the **tax increase treatment**, respondents most commonly cited company liquidation, relocation, and cost-cutting measures as potential responses to a tax hike.

Figure A10: Free Text Entries - Tax Decrease Treatment



Note: Figure [A10](#) displays the most common categories selected by respondents in the **tax decrease treatment** after indicating a positive share in the *Others* category.

Figure A11: Free Text Entries - Tax Increase Treatment

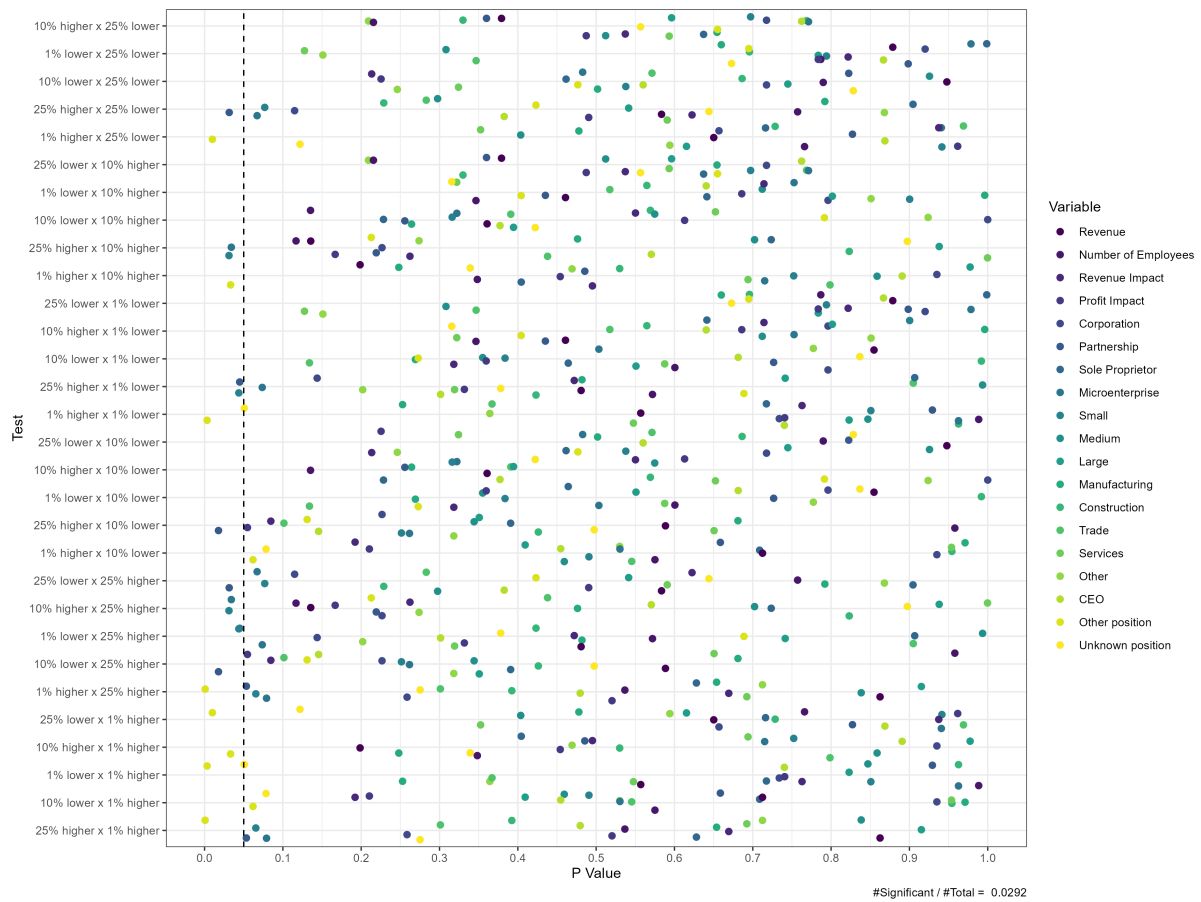


Note: Figure A11 displays the most common categories selected by respondents in the **tax increase treatment** after indicating a positive share in the *Others* category.

A.4. Balance Tests

To assess the effectiveness of our randomization procedure, we conducted multiple balance tests using the available characteristics of survey respondents. Figure A12 summarizes the results, displaying p-values from difference-in-means tests for each characteristic across all treatment combinations. The overall proportion of significant differences is 2.9%, well below the chosen significance threshold of 5%. Moreover, after applying the Benjamini and Yekutieli (2001) correction, the adjusted p-value for every test equals one, reinforcing our confidence that the treatment assignment was successfully randomized.

Figure A12: Covariate Balance Tests Across Treatment Cells.



Note: Figure A12 shows the results of difference-in-means tests for all firm and respondent characteristics across each combination of treatment sign and magnitude. Each point represents the p-value of a test. The dashed vertical line shows the 5% significance level. The proportion of significant tests out of the total number of tests conducted is only 2.9%, which is well below the chosen significance threshold of 5%. Therefore, we infer that there are no significant differences between our treatment groups.

A.5. Sample vs. German Firm Population

To derive insights that are generalizable to the entire German firm population, we construct weights to ensure our survey sample is as representative as possible across the following three dimensions: industry sector, number of employees, and revenues. These weights adjust for differences between the sample and the universe of active firms in Germany, allowing for more accurate estimations of population parameters.

Weighting survey data involves assigning each legally independent firm in the German Business Panel (GBP) a factor that reflects its relative importance in estimating population statistics, such as, e.g., the mean revenue of all German firms (Sand and Kunz, 2020). The objective is to compute firm-level weights, w_i , which serve as multiplicative factors for each observation i , ensuring that sample-based estimates closely approximate the true population values.

We employ the **raking method** of iterative proportional fitting (Kolenikov, 2014) to calculate survey weights, aligning the sample distribution with known population characteristics. The three key dimensions considered in this process are:

- **Industry sector** (1-digit WZ08 classification),¹
- **Number of employees** (0–9, 10–49, 50–249, ≥ 250 employees, subject to social insurance contributions),
- **Revenue categories** (EUR 0–2 million, EUR 2–10 million, EUR 10–50 million, $>$ EUR 50 million).

The calibration weights are constructed using the raking algorithm (Deming and Stephan, 1940; Kolenikov, 2014), which iteratively adjusts survey weights to align the sample’s marginal distributions with those of the target population. Specifically, the algorithm ensures that the weighted distributions of industry sector (1-digit WZ08), number of employees (subject to social insurance contributions), and revenues in the sample closely mirror the corresponding distributions in the 2019 business register of the Federal Statistical Office. The year 2019 was chosen as the reference point as it was the most recent dataset available during the sample design phase.

To prevent distortions caused by excessively high survey weights in underrepresented cells, we apply a trimming procedure, capping weights at the 5th and 95th percentiles of the distribution while ensuring that the total sum of weights remains unchanged.² This

¹ The WZ 2008 classification of the German Federal Statistical Office, compatible with the NACE Rev. 2 classification used by the European Community.

² We are grateful to Dr. Matthias Sand from GESIS (Department Survey Design and Methodology) for providing the weight-trimming algorithm.

approach helps stabilize the variance of the survey weights and minimizes the influence of extreme values in the analysis.

Table A1 compares the distribution of firms in our sample with the overall German firm population in terms of revenue, number of employees, and industry classification (1-digit WZ08) for the reporting year 2019 (RY 2019). Overall, the weighting process effectively increases the representativeness of our sample, aligning it closely with the broader German firm population.

Table A1: Sample vs. German Firm Population

	Unweighted Sample	Weighted Sample	Population (RY 2019)
Panel A: Revenues (in EUR)			
Less than EUR 2 mn.	0.764	0.927	0.932
EUR 2-10 mn.	0.168	0.054	0.051
EUR 10-50 mn.	0.051	0.014	0.013
EUR 50 mn. or more	0.016	0.004	0.004
Panel B: Employees subject to social insurance			
0-9 employees	0.667	0.865	0.874
10-49 employees	0.255	0.108	0.101
50-249 employees	0.064	0.022	0.021
250 and more employees	0.014	0.005	0.005
Panel C: Economic Sector (1-digit WZ08 Classification)			
B - Mining and quarrying	0.004	0.001	0.001
C - Manufacturing	0.173	0.068	0.064
D - Energy supply	0.007	0.014	0.022
E - Water supply	0.005	0.003	0.003
F - Construction	0.071	0.111	0.110
G - Trade	0.156	0.182	0.171
H - Transport and storage	0.028	0.034	0.032
I - Hospitality	0.054	0.076	0.071
J - Information and communication	0.134	0.042	0.039
K - Provision of financial and insurance services	0.037	0.023	0.021
L - Real estate and housing	0.032	0.057	0.053
M - Provision of freelance, scientific and technical services	0.132	0.160	0.150
N - Provision of other commercial services	0.075	0.069	0.064
P - Education and teaching	0.015	0.024	0.023
Q - Health and social services	0.025	0.047	0.071
R - Art, entertainment and recreation	0.024	0.036	0.034
S - Provision of other services	0.027	0.053	0.069
<i>N</i>	6,749		

Note: Table A1 presents the distribution of firms with respect to revenues, the number of employees, and the economic sector (1-digit WZ08 classification) for our sample of firms and the population of firms in Germany for the reporting year 2019 (RY 2019), based on the business register of the German Statistical Office. We use the reporting year 2019 for comparison, as it was the most recent year available at the time the sample pool was created.

A.6. Orbis Comparison: Participants vs. Non-participants

Section A.6 presents a balance table (Table A2) comparing the observable financial characteristics of firms in our survey sample (i.e., participants), as obtained from Orbis, with those of German firms in the Orbis database that did not participate in the survey or did not complete our survey (i.e., non-participants), using financial data from the 2019 reporting year. The selection of 2019 as the reference year was based on its status as the most recent available dataset at the time of sample construction. The comparison encompasses key financial indicators, including total assets, number of employees, turnover, cost of employees, and taxes on income, with all variables constrained to non-negative values. For each variable, we report the number of available observations within Orbis, along with the corresponding mean and median values. Furthermore, we conduct a t-test to assess differences in means between survey participants and non-participants, presenting the associated p-values. The survey sample comprises firms that explicitly consented to linking their survey responses with external data sources ($N = 2,435$). Overall, we find no significant differences in key financial metrics between survey participants and non-participants, suggesting that firms opting to participate and complete the survey do not systematically differ in financial characteristics from those in the Orbis database that were not included in our sample.

Table A2: Orbis Comparison: Participants vs. Non-participants

	Participants			Non-participants			p-value
	Obs.	Mean	p50	Obs.	Mean	p50	
Total Assets	793	11,374,676.10	798,066.00	462,984	13,879,657.47	1,005,009.00	0.86
Number of Employees	1,516	23.18	6.00	901,927	28.88	3.00	0.75
Turnover	606	13,105,905.96	900,000.00	228,972	19,909,355.46	1,050,000.00	0.68
Costs of Employees	62	16,558,588.39	4,492,631.00	42,142	11,847,030.72	4,427,542.50	0.62
Taxes on Income	58	658,508.95	230,522.50	39,746	965,969.31	142,365.00	0.82

Note: Table A2 compares the sample of firms participating in our survey with the reference group of German firms from Orbis that did not participate or did not complete our survey, using data from the reporting year 2019. The comparison includes total assets, number of employees, turnover, cost of employees, and taxes on income, with non-negative values required for all variables. We report the number of available observations in Orbis for each variable, along with the mean and median of each firm characteristic. Additionally, we present the p-value of a t-test comparing the means between participants and non-participants. The survey sample consists of firms that consented to linking their survey data with external data sources ($N = 2,435$). The reporting year 2019 was chosen as it was the most recent year available when the sample pool was created.

Furthermore, we investigate whether firms in our survey sample that consented to linking their survey data with external databases systematically differ in key financial characteristics reported in the survey compared to those that declined the linking agreement. Table A3 presents a comparative analysis based on key firm attributes, including revenue, number of employees, legal form, and sector. For each variable, we report the

number of observations, along with the corresponding mean and median values. Additionally, we provide the p-value from a t-test comparing the means between firms that agreed to the data-linking arrangement ($N = 2,435$) and those that did not ($N = 4,314$). Once again, we find no systematic differences between these groups. The only statistically significant difference observed pertains to the share of firms in the construction sector (p-value: 2%). However, this difference is economically negligible, with 6% of firms in the linking group compared to 8% in the non-linking group.

Firms that consented to data linking and have employee information available in Orbis ($N = 1,516$) tend to be smaller in terms of employment than the overall survey sample. At the same time, the median number of employees is very similar across groups, with a median of 5 for linked firms (Table A3) and 6 for all survey participants (Table A2). For the linked subsample, the number of employees reported in the survey itself has a mean of 43 and a median of 6. The close correspondence in medians—despite a lower mean reflecting the skewed firm-size distribution—suggests that there is no economically meaningful difference in survey-reported employment figures.

Table A3: Linking Agreed vs. Linking Not Agreed

	Linking Agreed			Linking Not Agreed			p-value
	Obs.	Mean	p50	Obs.	Mean	p50	
Revenues	1,959	30,206,127.46	650,000.00	3,300	13,672,687.66	750,000.00	0.23
Number of Employees	2,435	68.46	5.00	4,314	68.42	5.00	1.00
Corporation	2,435	0.72	1.00	4,314	0.73	1.00	0.24
Sole Proprietor	2,435	0.13	0.00	4,314	0.13	0.00	0.94
Partnership	2,435	0.15	0.00	4,314	0.14	0.00	0.12
Manufacturing	2,435	0.18	0.00	4,314	0.17	0.00	0.30
Construction	2,435	0.06	0.00	4,314	0.08	0.00	0.02
Trade	2,435	0.15	0.00	4,314	0.16	0.00	0.66
Other Sector	2,435	0.28	0.00	4,314	0.27	0.00	0.18

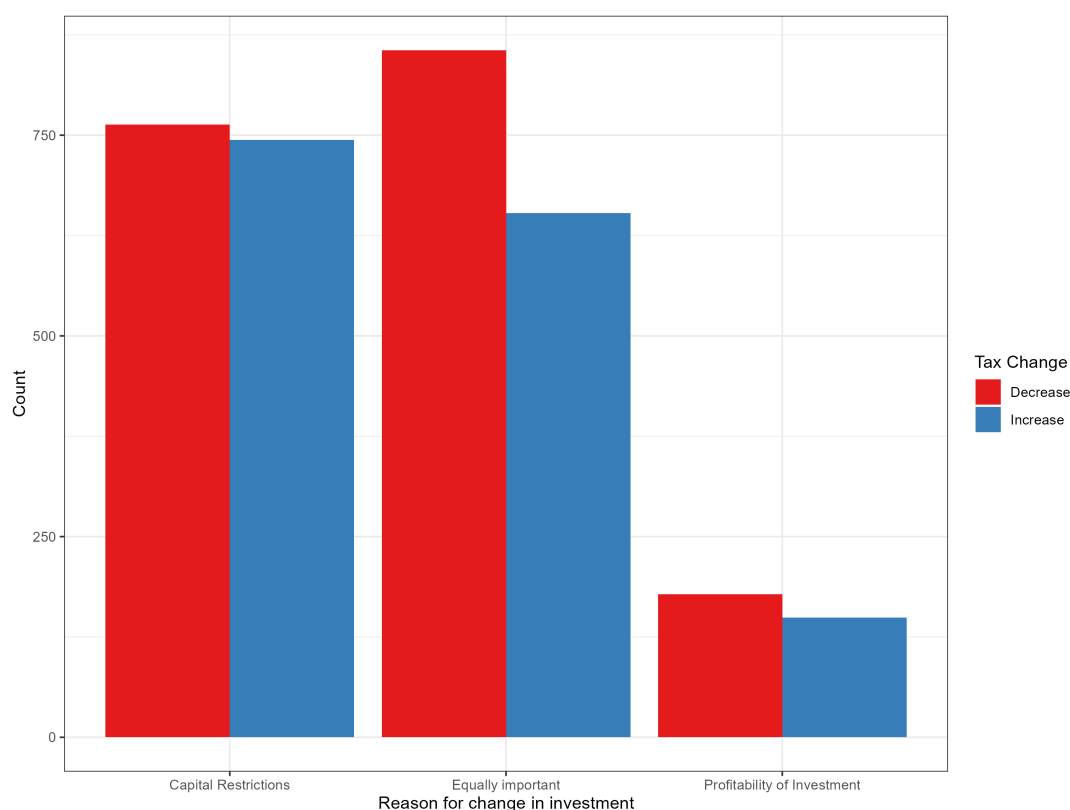
Note: Table A3 compares firms in our survey that consented to linking their survey data with external databases like Orbis to those that declined. The comparison is based on key firm characteristics, including revenue, number of employees, legal form, and sector. For each variable, we report the number of observations, as well as the mean and median values. Additionally, we present the p-value from a t-test comparing the means between firms that agreed to the linking agreement and those that did not. The smaller sample size for revenues is due to a lower response rate for the numerical revenue category in our survey.

A.7. Reasons for Investment Change

To better understand the factors driving companies' stated investment adjustments in response to tax changes, we asked respondents who allocated at least 5% of their adjustment shares to investment to explain their reasoning. Figure A8 in Supplemental Appendix A.2 provides an example of how this question appeared in the survey's online interface.

Participants rated their reasoning on a scale from 0 to 100, where 0 indicated that investment adjustments were primarily driven by changes in available funds following a tax decrease or increase, while 100 suggested that the perceived profitability of investments was the dominant factor. Lower values indicate that firms face capital constraints, whereas higher values suggest that the tax change primarily affects the profitability of investment opportunities.

Figure A13: Reasons for Change in Investment



Note: Figure A13 shows the results of a follow-up question respondents were asked when selecting a share of investment incidence greater or equal to 5%. After being asked why they attributed a substantial share to the investment category, respondents could adjust a slider ranging from 0 to 100, where 0 indicated that more/less funds were available to invest, 100 that the investment was more (less) worthwhile, and 50 that the factors were equally important. We binned the responses into three categories related to the slider prompts, with responses lower than 25 and larger than 75 being assigned to the polar cases.

Figure A13 presents the results of these follow-up questions. We categorized responses into three groups:

- **Capital Restriction** (*values below 25*), indicating that firms adjust investment primarily due to liquidity constraints.
- **Mixed Reasons** (*values between 25 and 75*), suggesting that both capital availability and investment profitability play a role.
- **Profitability-Driven** (*values above 75*), meaning that firms primarily adjust investment in response to changes in its expected returns.

Our findings suggest that the majority of firms adjust investment behavior due to capital constraints rather than shifts in the profitability of investment projects following a tax change.

A.8. Robustness Tests - Main Results

A.8.1. Ordinary Least Squares (OLS) Estimation

In this section, we present the results of the Ordinary Least Squares (OLS) estimation of Equation (1). These results, shown in Table A4, form the basis of the main findings discussed in Section 3.2.

For each category of incidence (i.e., the dependent variables listed in Table A4), we apply Ordinary Least Squares (OLS) estimation to Equation (1):

$$y_i = \beta_0 + \beta_1 \text{Increase}_i + \beta_2 \text{Medium Change}_i + \beta_3 \text{Large Change}_i + \beta_4 \text{Increase}_i \times \text{Medium Change}_i + \beta_5 \text{Increase}_i \times \text{Large Change}_i + \varepsilon_i, \quad (1)$$

where the dependent variable, y_i , represents the proportion assigned to each category. The key explanatory variables include Increase_i , Medium Change_i , and Large Change_i along with their interaction terms, which serve as binary indicators for directionality and magnitude (10% and 25%, respectively). The estimated coefficients, $\beta_i, i = 0, \dots, 5$, enable us to assess asymmetries between tax increases and decreases, as well as the differential impact of tax change magnitudes.

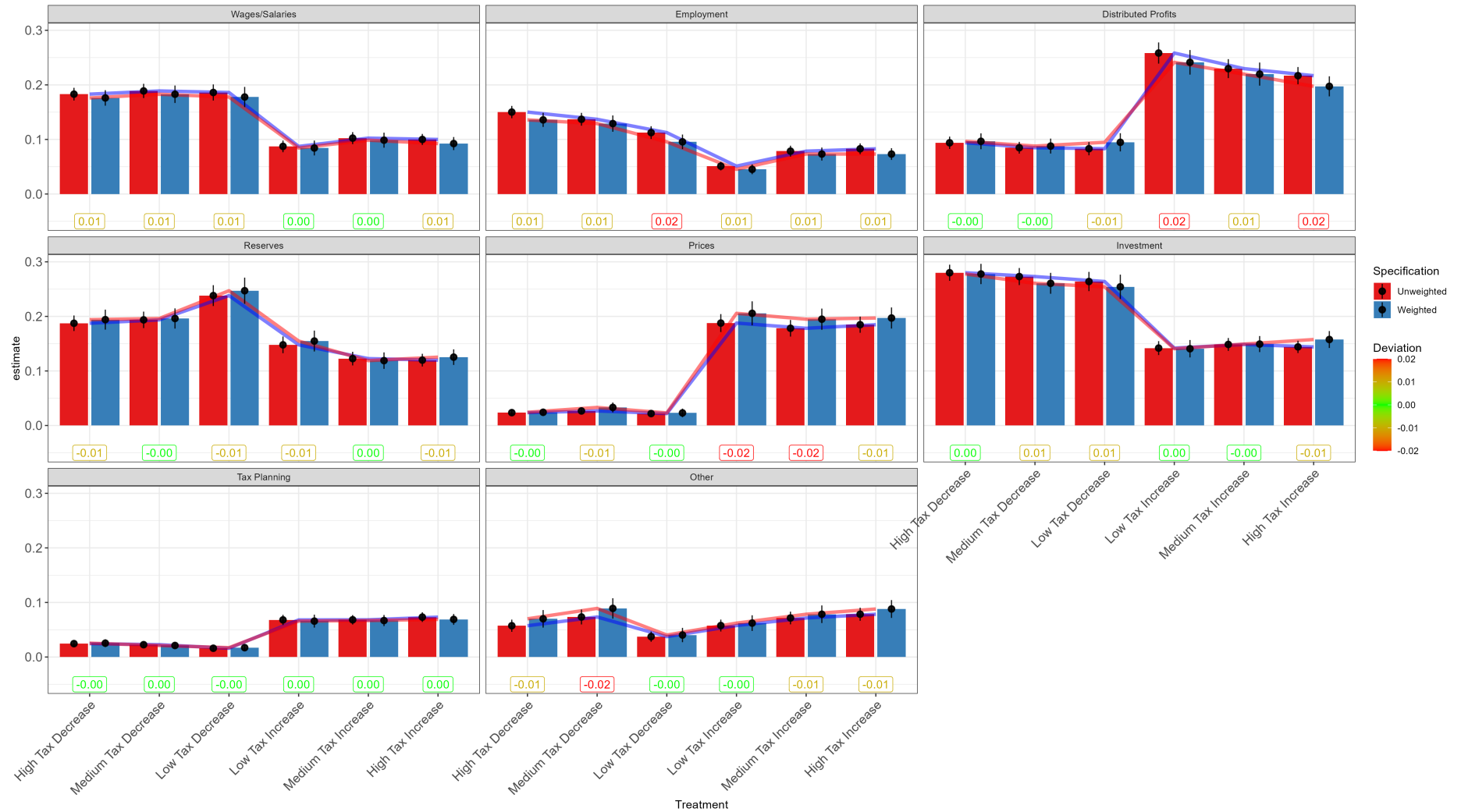
We begin by exploring the sensitivity of our main results with respect to the usage of survey weights. Figure A14 compares our main estimates from Equation (1) with weighted regressions that apply the survey weights described in Section A.5. The comparison suggests that there are only minor differences between weighted and unweighted point

estimates, with none of them exceeding a two percentage point difference in estimated incidence. However, the unweighted coefficients are estimated with greater precision. Therefore, we opt for unweighted regressions throughout our paper.

As part of our robustness analysis, we incorporate additional control variables in Table A5 to enhance the accuracy of our estimates. These controls include industry-specific dummies for key economic sectors (Manufacturing, Construction, Trade, and Services), dummy variables for a firm’s legal structure, and dummies for firm size – small, medium, and large – based on annual revenue. Additionally, we introduce an indicator identifying firms that experienced a substantial financial impact from the COVID-19 pandemic. A firm is classified as significantly affected by COVID-19 if its reported percentage change in net income is lower than the median of the distribution.

The results of Equation (1) estimated using OLS with controls, as shown in Table A5, indicate that the estimated effects remain largely consistent with those obtained without controls. This results strengthens our confidence in the main findings presented in Section 3.2.

Figure A14: Weighted versus Unweighted Regressions



Note: Figure A14 shows the estimated incidence share for the respective category across the six different treatments based on Equation (1), once for the weighted and once for the unweighted regression. The boxed numbers below each pair of coefficient estimates indicate their difference. Robust confidence bounds are indicated by vertical lines.

Table A4: Asymmetry and Magnitude Effects - Without Controls

	Wages/Salaries	Employment	Distributed Profits	Reserves	Prices	Investment	Tax Planning	Other
Constant	0.186*** (0.008)	0.113*** (0.006)	0.083*** (0.006)	0.238*** (0.010)	0.022*** (0.003)	0.264*** (0.009)	0.016*** (0.003)	0.037*** (0.005)
Increase	-0.099*** (0.009)	-0.061*** (0.007)	0.175*** (0.012)	-0.090*** (0.012)	0.166*** (0.009)	-0.122*** (0.011)	0.052*** (0.005)	0.020*** (0.007)
Medium Change	0.003 (0.010)	0.024*** (0.008)	0.002 (0.008)	-0.044*** (0.012)	0.005 (0.004)	0.009 (0.012)	0.007* (0.004)	0.036*** (0.008)
Large Change	-0.003 (0.010)	0.038*** (0.008)	0.011 (0.008)	-0.051*** (0.012)	0.002 (0.004)	0.016 (0.012)	0.008** (0.004)	0.020*** (0.007)
Increase x Medium Change	0.012 (0.013)	0.003 (0.011)	-0.030* (0.016)	0.019 (0.016)	-0.014 (0.012)	-0.002 (0.015)	-0.006 (0.008)	-0.022* (0.012)
Increase x Large Change	0.016 (0.012)	-0.006 (0.011)	-0.052*** (0.015)	0.023 (0.016)	-0.005 (0.012)	-0.014 (0.015)	-0.003 (0.008)	0.001 (0.011)
Controls	No	No	No	No	No	No	No	No
Num.Obs.	6749	6749	6749	6749	6749	6749	6749	6749
R2 Adj.	0.046	0.035	0.079	0.026	0.136	0.065	0.035	0.004

Note: Table A4 presents the coefficient estimates and robust standard errors for our main specification (Equation (1)) **without controls**, estimated using OLS. The dependent variable represents the share allocated to each category. The key explanatory variables include Increase_i , which indicates whether a firm was subject to a tax increase treatment, as well as Medium Change_i and Large Change_i , which capture the magnitude of the tax change (10% and 25%, respectively), and interaction terms. The benchmark group represented by the constant coefficient is respondents assigned to a small tax decrease. Hence, the incidence share for respondents assigned to a small tax increase is given by the sum of the constant coefficient and the coefficient of Increase. Robust standard errors are given in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A5: Asymmetry and Magnitude Effects - With Controls

	Wages/Salaries	Employment	Distributed Profits	Reserves	Prices	Investment	Tax Planning	Other
Constant	0.188*** (0.009)	0.106*** (0.008)	0.119*** (0.009)	0.251*** (0.012)	0.019*** (0.006)	0.249*** (0.011)	0.012*** (0.004)	0.026*** (0.007)
Increase	-0.099*** (0.009)	-0.062*** (0.007)	0.175*** (0.012)	-0.090*** (0.012)	0.166*** (0.009)	-0.122*** (0.011)	0.052*** (0.005)	0.020*** (0.007)
Medium Change	0.003 (0.010)	0.025*** (0.008)	0.000 (0.008)	-0.045*** (0.012)	0.005 (0.004)	0.010 (0.012)	0.007* (0.004)	0.036*** (0.008)
Large Change	-0.003 (0.010)	0.038*** (0.008)	0.011 (0.008)	-0.051*** (0.012)	0.002 (0.004)	0.015 (0.012)	0.009** (0.004)	0.020*** (0.007)
Increase x Medium Change	0.013 (0.013)	0.002 (0.011)	-0.027*** (0.015)	0.019 (0.016)	-0.015 (0.012)	-0.004 (0.015)	-0.007 (0.008)	-0.022* (0.012)
Increase x Large Change	0.015 (0.012)	-0.006 (0.010)	-0.050*** (0.015)	0.022 (0.016)	-0.006 (0.012)	-0.013 (0.015)	-0.003 (0.008)	0.001 (0.011)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num.Obs.	6749	6749	6749	6749	6749	6749	6749	6749
R2 Adj.	0.054	0.042	0.100	0.029	0.144	0.072	0.035	0.009

Note: Table A5 presents the coefficient estimates and robust standard errors for our main specification (Equation (1)) **with controls**, estimated using OLS. The dependent variable represents the share allocated to each category. The key explanatory variables include Increase_i , which indicates whether a firm was subject to a tax increase treatment, as well as Medium Change_i and Large Change_i , which capture the magnitude of the tax change (10% and 25%, respectively). Controls include: economic sector (Manufacturing, Construction, Trade, and Services), legal form, firm size and percentage change in revenues or net income due to COVID-19. Robust standard errors are given in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

A.8.2. Multivariate Fractional Logit Estimation

In addition to estimating Equation (1) using OLS, we employ an alternative estimation method to assess the robustness of our results. This second approach accounts for the fractional nature of our response variables, whereas OLS estimation of Equation (1) disregards both the bounded nature of the outcome variables and the unit-sum constraint.

To enhance clarity, we start by describing the system of equations relevant in our experimental design. Following Mullahy (2015), let $\mathbf{y} \equiv (\mathbf{y}_1, \dots, \mathbf{y}_M)$ denote the $N \times M$ matrices of outcomes, where $y_{im} \in [0, 1]$ denotes the share in percent attributed to category m in company i , N the number of firms in the sample, and M the number of categories. Letting $\mathbf{X}$ denote the $N \times K$ matrix of additional covariates, we can characterize the system of share equations as

$$E[y_{im}|\mathbf{X}] = G_m(\mathbf{X}; \boldsymbol{\beta}) \in (0, 1), \quad m = 1, \dots, M \quad (3)$$

$$\sum_{m=1}^M y_{im} = 1, \quad i = 1, \dots, N, \quad (4)$$

$$\Pr(y_{im} = 0|X) > 0 \quad \forall m = 1, \dots, M, \quad (5)$$

$$\Pr(y_{im} = 1|X) > 0 \quad \forall m = 1, \dots, M, \quad (6)$$

where $\boldsymbol{\beta} = (\boldsymbol{\beta}_1, \dots, \boldsymbol{\beta}_M)$ is a $K \times M$ vector of parameters and $G_m(\mathbf{X}; \boldsymbol{\beta})$ a parametric conditional mean function. Equation (3) signifies the bounded nature of our outcome variables. Note that the condition as stated precludes the case in which one share obtains a boundary value $\mu \in \{0, 1\}$ for some combination of covariates $\mathbf{X}$.³ Equation (4) is the unit-sum constraint, stemming from the fact that, by construction, the shares of different categories need to sum to one for each firm in the sample. Equations (5) and (6) illustrate that individual shares might attain boundary values with non-trivial probabilities, which requires special care when choosing the correct econometric specification. Taken together, the four equations characterize our data structure as so-called compositional or **multivariate fractional response data**. Our main interest lies in estimating the parameters $\boldsymbol{\beta}$ of the conditional mean functions $G_m(\mathbf{X}; \boldsymbol{\beta})$.

Like mentioned above, in our baseline specification (i.e., OLS estimation), we ignore the bounded nature of our outcome variables (Equation (3)) as well as the unit-sum constraint (Equation (4)) and assume a linear conditional mean function for each category m . Ignoring the underlying restrictions of our data set has two main potential drawbacks, as pointed out, e.g., by Mullahy (2015) or Murteira and Ramalho (2016). First, similar to a linear probability model, predicted shares are not guaranteed to fall in the interval

³ The fringe case where a share would obtain a boundary value for all combinations of covariates is not particularly interesting for further analysis and not a concern in our setting.

$[0, 1]$ for all combinations of covariates, and do not necessarily sum to one. Second, the model might misrepresent the partial effects of covariates.

Because of the aforementioned shortcomings of the linear model (OLS) and to check for the robustness of our results when accounting for these shortcomings, we also consider an alternative specification for the conditional mean functions $G_m(\mathbf{X}; \boldsymbol{\beta})$, $m = 1, \dots, M$. Following Mullahy (2015), we specify the M conditional means to have a multinomial logit functional form given as

$$E[y_{im}|\mathbf{X}] = G_m(\mathbf{X}; \boldsymbol{\beta}) = \frac{\exp(\mathbf{x}'_i \boldsymbol{\beta}_m)}{\sum_{l=1}^M \exp(\mathbf{x}'_i \boldsymbol{\beta}_l)}, \quad m = 1, \dots, M. \quad (7)$$

The linear specification for the index, $\mathbf{x}'_i \boldsymbol{\beta}_m$, is defined analogous to our main OLS specification in Equation (1). As for the conventional multinomial logit model, the parameters of the conditional mean functions $\boldsymbol{\beta}$ are not identified without imposing a normalization restriction. We choose investment as the reference category. Suppose without loss of generality that category M is the *investment* category. That way, we can rewrite the conditional means as

$$E[y_{im}|\mathbf{X}] = G_m(\mathbf{X}; \boldsymbol{\beta}) = \frac{\exp(\mathbf{x}'_i \boldsymbol{\delta}_m)}{1 + \sum_{l=1}^{M-1} \exp(\mathbf{x}'_i \boldsymbol{\delta}_l)}, \quad m = 1, \dots, M, \quad (8)$$

where $\boldsymbol{\delta}_m \equiv \boldsymbol{\beta}_m - \boldsymbol{\beta}_M$. Interpretation of signs and magnitudes of the estimated $\boldsymbol{\delta}$ coefficients is in general not straightforward. Far more useful in our context, where we want to compare the results of the multivariate fractional logit model with the OLS estimates, are the average partial effects resulting from the model, which are invariant to the selected normalization procedure. For a binary regressor $x_{ik} \in \{0, 1\}$, the average partial effect (APE) in the multivariate fractional logit model is the average discrete change in the predicted share when x_{ik} switches from 0 to 1, holding all other covariates fixed:

$$\begin{aligned} \widehat{APE}_{mk} &= \frac{1}{N} \sum_{i=1}^N \widehat{PE}_{mki} \\ &= \frac{1}{N} \sum_{i=1}^N \frac{\Delta E[y_{im}|\mathbf{x}_i]}{\Delta x_{ik}} \\ &= \frac{1}{N} \sum_{i=1}^N \left[\frac{\exp(\mathbf{x}'_{-k,i} \boldsymbol{\beta}_{m,-k} + \beta_{mk})}{1 + \sum_{l=1}^{M-1} \exp(\mathbf{x}'_{-k,i} \boldsymbol{\beta}_{l,-k} + \beta_{lk})} - \frac{\exp(\mathbf{x}'_{-k,i} \boldsymbol{\beta}_{m,-k})}{1 + \sum_{l=1}^{M-1} \exp(\mathbf{x}'_{-k,i} \boldsymbol{\beta}_{l,-k})} \right], \quad (9) \end{aligned}$$

where $\Delta x_{ik} = 1$ and $\mathbf{x}_{-k,i}$ denotes the vector of explanatory variables for observation i excluding variable k .

Table A6 compares the average partial effects estimated using Ordinary Least Squares (OLS) and the Multivariate Fractional Logit (MFL) model across different treatment conditions. The comparison focuses on three key contrasts: (i) increases versus decreases, (ii) medium changes (10%) versus small changes (1%), and (iii) large changes (25%) versus

small changes (1%). The results show that the estimated effects are largely consistent across both models, reinforcing the robustness of our main findings.

Table A6: Comparison of Average Partial Effects.

	Increase vs. Decrease		Medium vs. Small Change		Large vs. Small Change	
	OLS	MFL	OLS	MFL	OLS	MFL
Wages/Salaries	-0.099(0.009)***	-0.092(0.005)***	0.009(0.006)	0.006(0.006)	0.005(0.006)	0.002(0.006)
Employment	-0.061(0.007)***	-0.064(0.004)***	0.026(0.005)***	0.026(0.005)***	0.035(0.005)***	0.036(0.005)***
Distributed Profits	0.175(0.012)***	0.146(0.006)***	-0.014(0.008)	-0.016(0.008)	-0.016(0.008)	-0.016(0.008)
Reserves	-0.090(0.012)***	-0.078(0.006)***	-0.035(0.008)***	-0.040(0.008)***	-0.039(0.008)***	-0.044(0.008)***
Prices	0.166(0.009)***	0.158(0.005)***	-0.002(0.006)	-0.005(0.006)	-0.001(0.006)	-0.002(0.006)
Investment	-0.122(0.011)***	-0.128(0.006)***	0.008(0.007)	0.002(0.007)	0.009(0.007)	0.001(0.007)
Tax Planning	0.052(0.005)***	0.049(0.003)***	0.003(0.004)	0.004(0.004)	0.007(0.004)	0.007(0.004)
Other	0.020(0.007)**	0.010(0.005)*	0.025(0.006)***	0.023(0.006)***	0.020(0.006)***	0.016(0.006)**

Note: Table A6 compares the average partial effects from our preferred OLS specification (Equation (1)) with the MFL specification, which takes into account the fractional nature of our response variables as well as their interdependency. The comparison examines three main contrasts: (i) increases versus decreases, (ii) medium changes (10%) against small changes (1%), and (iii) large changes (25%) against small changes (1%). Robust standard errors are given in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

A.9. Robustness Tests - Heterogeneity

In Section 4 of the main text, we examine treatment effect heterogeneity across firm size, economic sector, legal structure, and net income impact from COVID-19. In this section, we extend the analysis from Section 4 by incorporating all relevant firm heterogeneity characteristics into a single estimation model, thereby controlling for other firm characteristics when testing effect heterogeneity along a specific margin. We assess variation in incidence using the following OLS regression

$$y_i = \beta_0 + \beta_1 \text{Increase}_i + \gamma'_1 \mathbf{x}_i^* + \gamma'_2 \text{Increase}_i \times \mathbf{x}_i^* + \varepsilon_i, \quad (10)$$

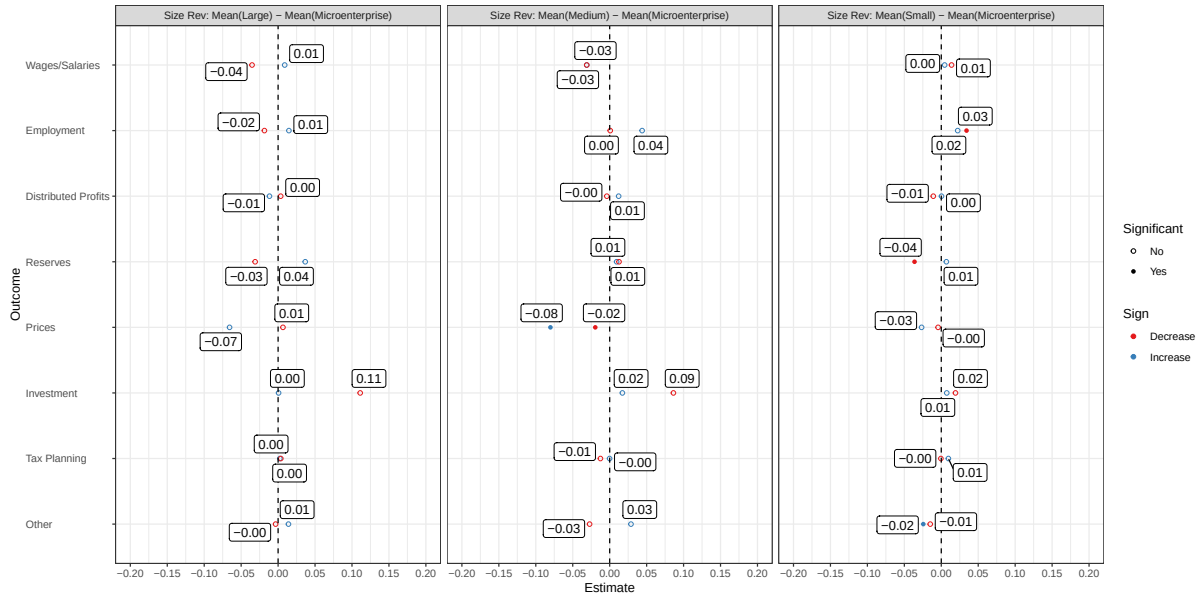
where $\mathbf{x}_i^*$ represents a vector of firm characteristics: dummies for firm size, economic sector, legal structure, and net income impact from COVID-19.⁴ As in Specification (2), we aggregate the treatment intensity groups and classify treatment solely based on whether an individual firm was part of a tax increase treatment or not, as indicated by Increase_i , a dummy variable. Since treatment intensity was randomly assigned and is, therefore, uncorrelated with firm characteristics, this approach should not introduce bias.

Figure A15 (firm size), Figure A16 (economic sector), Figure A17 (legal form), and Figure A18 (net income impact from COVID-19) display the average partial effects for each comparison with the baseline, based on the estimated coefficients from Equation (10). Significant average partial effects, determined using the Benjamini and Yekutieli (2001) correction, are represented by filled dots, while insignificant effects are shown as hollow circles.

The results closely align with those in Section 4 for almost all heterogeneities, where we estimate separate OLS regressions for each of the four firm characteristics. The only exception is the net income impact of the COVID-19 pandemic, where the point estimates turn insignificant when including controls for other firm characteristics. This is likely due to correlation of the economic impact of the pandemic with industry and size.

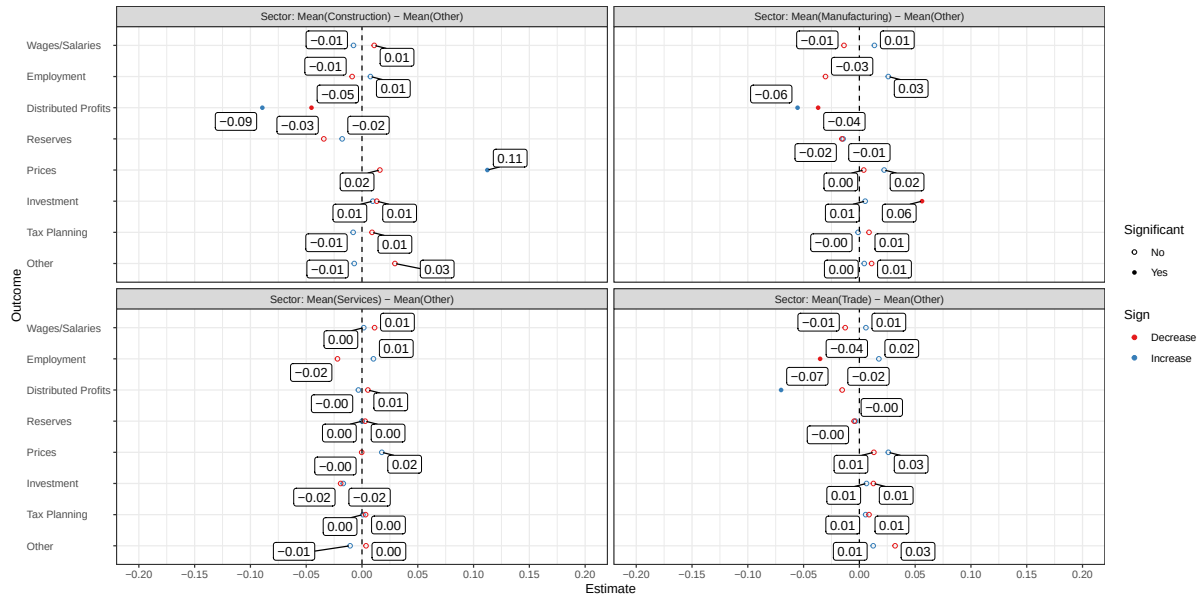
⁴ We measure firm size based on reported 2019 revenue, following the European Commission's classification: micro-enterprises (<EUR 2 million), small (<EUR 10 million), medium (<EUR 50 million), and large ($\geq$ EUR 50 million). For economic sector classification, firms self-reported their industry in the survey, and we assign them to manufacturing, construction, trade, or services, with all others categorized as *other*. Legal forms are grouped into corporations, partnerships, and sole proprietors. Finally, we classify firms based on their self-reported impact from COVID-19. Respondents rated the effect on net income from -100 to +100, and we define a dummy variable equal to one for firms below the median value.

Figure A15: Average partial effects of revenue size category with control variables.



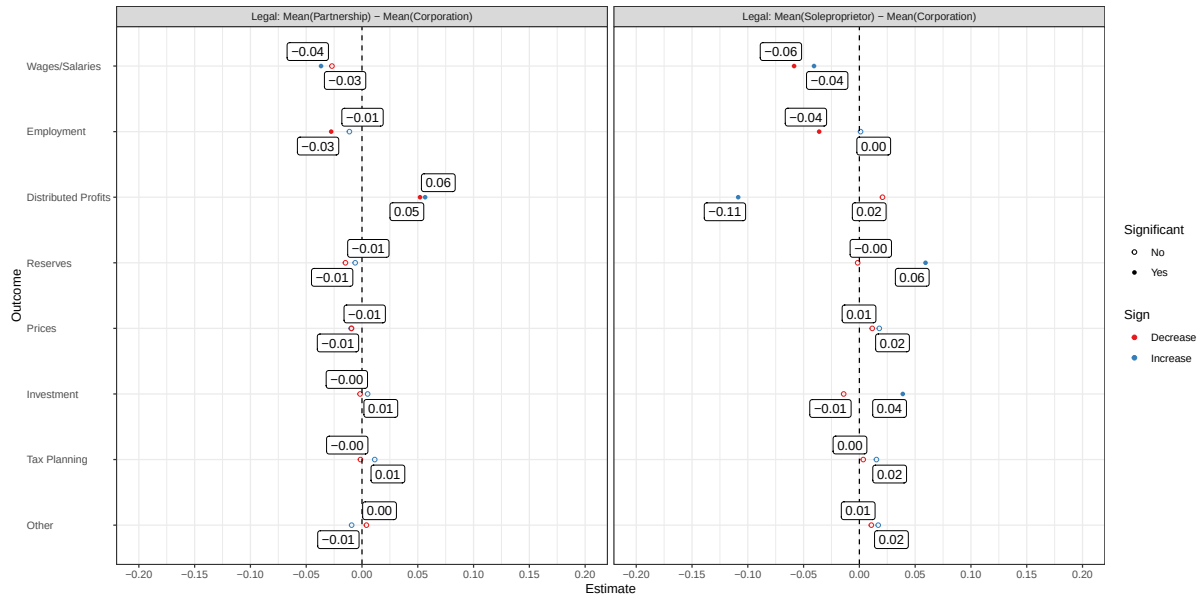
Note: Figure A15 shows heterogeneity in managerial adjustment margins by company size measured by revenues. The figure shows average partial effects for each comparison with the baseline based on the estimated coefficients from Equation (10). Average partial effects with a significant p-value after applying the Benjamini and Yekutieli (2001) correction are denoted by filled dots, whereas insignificant effects are illustrated by hollow circles.

Figure A16: Average partial effects of economic sector with control variables.



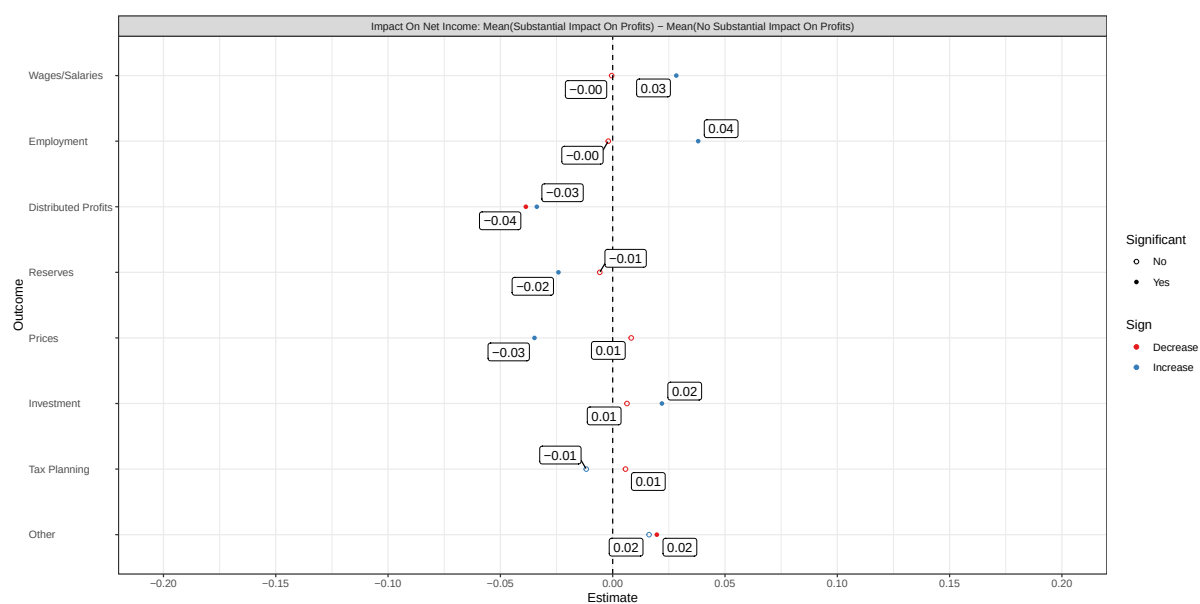
Note: Figure A16 shows heterogeneity in managerial adjustment margins by economic sector. The figure shows average partial effects for each comparison with the baseline based on the estimated coefficients from Equation (10). Average partial effects with a significant p-value after applying the Benjamini and Yekutieli (2001) correction are denoted by filled dots, whereas insignificant effects are illustrated by hollow circles.

Figure A17: Average partial effects of organizational form with control variables.



Note: Figure A17 shows heterogeneity in managerial adjustment margins by company legal form. The figure shows average partial effects for each comparison with the baseline based on the estimated coefficients from Equation (10). Average partial effects with a significant p-value after applying the Benjamini and Yekutieli (2001) correction are denoted by filled dots, whereas insignificant effects are illustrated by hollow circles.

Figure A18: Average partial effects of COVID-19 impact on net income with control variables.



Note: Figure A18 shows heterogeneity in managerial adjustment margins by whether the company was substantially impacted by COVID-19. The figure shows average partial effects for each comparison with the baseline based on the estimated coefficients from Equation (10). Average partial effects with a significant p-value after applying the Benjamini and Yekutieli (2001) correction are denoted by filled dots, whereas insignificant effects are illustrated by hollow circles.

B. Incidence Estimates in Previous Literature

Table [B1](#) provides a comprehensive summary of previous studies on tax incidence. In contrast to Table [5](#), which highlights selected recent studies, Table [B1](#) also incorporates corporate tax incidence estimates from earlier published research and working papers.

Table B1: Tax Incidence Estimates

Paper	Tax Variation	Tax Change	Country	Episode	Incidence on			
					Workers	Firm Owners	Consumers	Land Owners
Arulampalam et al. (2012)	Cross-company differences in tax liability	Increases and Decreases (pooled)	Belgium, Finland, France, Germany, Italy, Netherlands, Spain, Sweden, UK	1996-2003	49% (long run) 64% (short run)	51% (long run) 36% (short run)	-	-
Azémar and Hubbard (2015)	Cross-country variation in the statutory corporate tax	Increases and Decreases (pooled)	13 OECD countries	1980–2004	60%	-	-	-
Baker et al. (2023)	Variation in state corporate tax rates	Increases and Decreases (pooled)	USA	2006-2017	Primary spec.: 28% Alternative: 36%	Primary spec.: 20% Alternative: 21%	Primary spec.: 51% Alternative: 43%	-
Carbonnier et al. (2022)	Large French corporate income tax credit	Decrease	France	2009-2015	50% Range: 40%-60%	50%	-	-
Carroll (2009)	Variation in states' corporate taxes	Increases and Decreases (pooled)	USA	1970-2007	>100% (i.e. 250%)	-	-	-
Desai et al. (2007)	Cross-country differences in corporate taxes	Increases and Decreases (pooled)	52 countries	1989-2004	Baseline: 57%, Range: 45%-75%	Baseline: 43%, Range: 25%-55%	-	-
Dobridge et al. (2021)	Variation in the Domestic Production Activities Deduction	Decrease	USA	1999-2015	80%	20%	-	-
Duan and Moon (2025)	Corporate tax cuts	Decrease	Canada	2001-2017	73%, owner-workers: 39%	27%	-	-
Dwenger et al. (2019)	Federal tax cut/Variation in effective corporate tax burden	Decrease	Germany	1998–2006	19% (long-run) - 28% (short-run)	-	-	-
Felix (2007)	Variation in Corporate tax rate	Increases and Decreases (pooled)	30 countries	1979–2002	>100% Range: 235%-620%	-	-	-
Felix (2009)	Variation in states' corporate taxes	Increases and Decreases (pooled)	USA	1977-2005	>100%, Gravelle (2011): 141%-360%	-	-	-
Felix and Hines (2022)	State tax changes	Variation between unionized and non-unionized workers	USA	2000	31% (fully unionized firm)	-	-	-
Fuest et al. (2018)	Variation in local business tax changes	Increases (93% Increases)	Germany	1993-2012	51%	49%	-	-
Hassett and Mathur (2006)	Cross-country variation in corporate tax rate	Increases and Decreases (pooled)	72 countries	1981-2003	>100%, Gravelle (2011): 630%	-	-	-
Hassett and Mathur (2015)	Cross-country variation in the statutory corporate tax	Increases and Decreases (mostly decreases)	66 countries	1981–2005	50%	-	-	-
Jacob et al. (2023)	Variation in local business tax rate	Increase	Germany	2014–2017	-	36% Range: 28%-39%	64% Range: 61%-72%	-
Kennedy et al. (2024)	US corporate tax change (TCJA)	Decrease	USA	2013-2019	48%	51%	-	-

(Table continues on the next page)

Paper		Tax Variation	Tax Change	Country	Episode	Incidence on			
						Workers	Firm Owners	Consumers	Land Owners
Liu and Altshuler (2013)		Variation in Corporate Income Tax across industry and time	Increases and Decreases (pooled)	USA	1982, 1992, 1997	60%, Lower bound: 42%	40%, Upper bound: 58%	-	-
Ohrn (2023)		Federal corporate tax break	Decrease	USA	1998–2012	17%-25% (Top-5 highest paid executives)	-	-	-
Risch (2024)		Change in top marginal personal tax rate in the United States	Increase	USA	2008-2016	11-18%	approx. 80%	-	-
Suárez (2016)	Serrato and Zidar	Variation in US state taxes and apportionment rules	Increases and Decreases (pooled)	USA	1980–2012	30-35%	40%	-	25-30%
Suárez (2023)	Serrato and Zidar	Variation in US state taxes and apportionment rules	Increases and Decreases (pooled)	USA	1980–2012	35%	38.1%	-	26.8%
Suárez (2024)	Serrato and Zidar	Variation in US state taxes and apportionment rules	Increases and Decreases (pooled)	USA	1980–2012	25-40%	50%	-	10-25%

Note: Table B1 summarizes previous estimates of tax incidence found in the literature on workers, capital/firm owners, consumers, and land owners. "-": Indicates that no information on the incidence for this group was provided, or that it was explicitly assumed to be 0% in the respective study.

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