

# Do talk money – Reducing income nonresponse in surveys

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## Item nonresponse: a constant issue in surveys

- Convincing people to participate in surveys is hard, many decline (unit nonresponse)
- Even if people agree to participate in a survey, they still do not answer all questions (item nonresponse)
- Questions about monetary values are relatively often refused

⇒ Many survey respondents do not tell their income:

- Data from the US, DE and AU suggest between 14% to 35% nonresponse for questions about the exact income amount
- In our own survey, these shares range between 14% to more than 50%

# Why do respondents not tell their income?

- Income data are considered sensitive information
  - In many cultural contexts, the social norm is not to talk about income
- ⇒ Respondents do not want to tell their income
- 
- People do not know the exact (net) amount they earn
  - People do not know what other members of their household earn
  - People (and researchers) do not know what counts as income
- ⇒ Respondents cannot tell their income

# Why is income nonresponse a problem?

Any missing value can bias and complicate the data analysis

- Either the whole observation is dropped, which undermines representativeness and statistical power
- Or missing values are imputed, for which strong assumptions must be made and which can be very time-consuming

This is especially bad when it comes to income variables

- Income is one of the most used variables in applied microeconomics (it is a standard control variable and much more)
- ⇒ There are several approaches to reduce nonresponse on income

# Our study: implement a promising approach and test it

There is a consensus that reducing complexity reduces nonresponse

- List all potential sources of income separately
- Ask in ranges instead of asking for an exact number
- Use a bi-section method instead of providing a full list

⇒ So far, these approaches are rarely tested in a rigorous way

We conduct a randomized survey experiment in four countries

- Treatment reduces complexity substantially by asking income in three brackets (terciles) instead of more than 20 brackets

⇒ Does this reduce income nonresponse, and if yes, by how much?

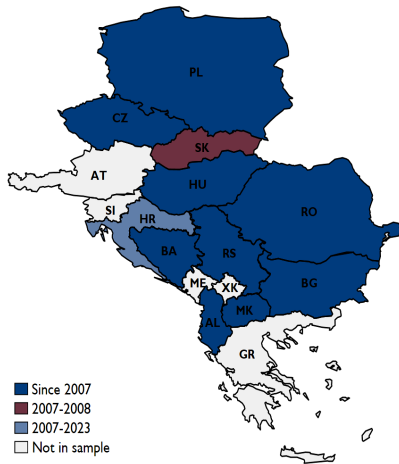
⇒ Are there positive spillovers on subsequent income questions?

⇒ Who responds to the treatment?

# Data and experimental design

# The OeNB Euro Survey

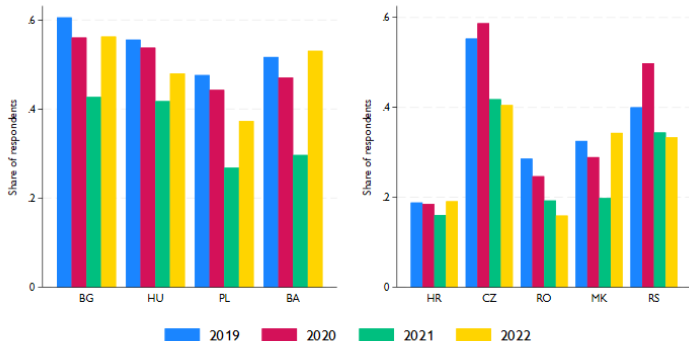
- Repeated, annual, cross-sectional survey of individuals in 10 countries
- Face-to-face, random sample: 1,000 observations per country-wave
- Granular geographic information
- Harmonized questionnaires
- Main themes: household finance, expectations, experiences and trust



# Income nonresponse in previous waves

*“What is the total monthly income of your household after taxes? If you cannot provide an exact amount an approximate answer would also be helpful.”*

Nonresponse to exact household income amounts



Source: OeNB Euro Survey, waves 2019-2022.  
2021 might not be comparable as income was asked differently.

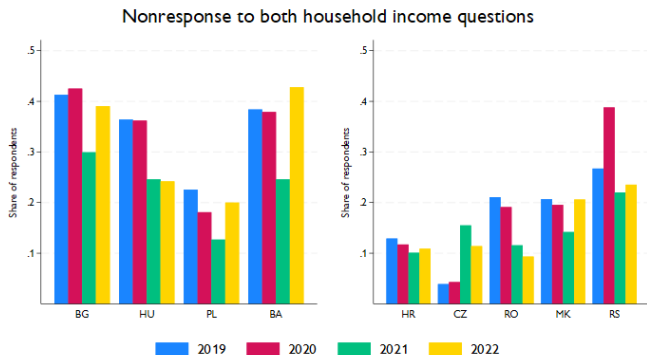


## The old method to tackle nonresponse is quite arduous

*"I am now showing you a card with different amounts. Could you choose the range that best fits the amount of your monthly household's income after taxes?"*

	BG	HU	PL	BA
1	1-400 BGN	1-80.000 HUF	1-1000 PLN	1-100 KM
2	401-600 BGN	80.001-100.000 HUF	1000-1499 PLN	101-200 KM
3	601-800 BGN	100.001-120.000 HUF	1500-1999 PLN	201-250 KM
[...]	[...]	[...]	[...]	[...]
24	Over 6000 BGN	[...]	Over 17500 PLN	[...]
27		[...]		Over 4001 KM
32		Over 1.400.000 HUF		

# It still works well in some countries



Source: OeNB Euro Survey, waves 2019-2022.  
2021 might not be comparable as income was asked differently.

⇒ Use those countries for the experiment, for which it does not work well:  
Bosnia & Herzegovina, Bulgaria, Hungary and Poland

## Treatment group

“Could you tell me if your household income is . . .

- 1 Below [Lower bound of 2. tercile]
- 2 Between [Lower bound of 2. tercile] and [Lower bound of 3. tercile]
- 3 Above [Lower bound of 3. tercile]”

## Control group

Receives the old question with many brackets:

- BA: list with 27 brackets
- BG: list with 24 brackets
- PL: list with 24 brackets
- HU: list with 32 brackets

# Hypothesis 1: nonresponse reduction

The treatment is supposed to be:

- less privacy-invading because the information is less accurate
- less cognitively demanding because the information is less accurate

*H1-0: The share of refused answers to household income is equal in the treatment and in the control group.*

*(H1-a: The share of refused answers to household income is lower in the treatment than in the control group.)*

Separate hypotheses for each country

## Hypothesis 2: potential spillovers

Most respondents will be asked about personal income too

The treatment might:

- increase trust in the interviewer and the questionnaire
  - make it clearer that a very approximate answer is acceptable
- ⇒ decrease the refusal to report exact amounts in subsequent questions

*H2-0: The share of refused answers to the exact amount of personal income is equal in the treatment and in the control group.*

*(H2-a: The share of refused answers to the exact amount of personal income is lower in the treatment than in the control group.)*

# Experimental setup

- Surveys were conducted between Sep.-Dec. 2023
- CAPI-interviews, except for 22% PAPI-interviews in PL
- 946 respondents in BA, 1,001 in BG, 1,000 in HU and 1,012 in PL
- Different approaches to randomize in each country
  - HU and PL computerized, BA and BG manually
  - Only those who refused exact amount are randomized (except in HU)
  - Randomization is always stratified by interviewer
- Pre-registered with PAP at the Social Science Registry, ID: 0012215

## Descriptive statistics on treatment and control

	BG	HU	PL	BA
Gender (f/m)	0.02	-0.07	-0.03	0.04
Age (in years)	0.23	-2.10	-0.59	-2.29
Education (in categories)	0.13	-0.20*	-0.01	0.01
Main earner in household (0/1)	0.02	-0.10**	-0.05	0.03
Manages household finances (0/1)	0.05*	-0.06**	-0.02	0.04
Respondent apprehensive (0/1)	0.03	0.00	-0.03	0.03
Size of Household	-0.01	0.25**	0.22**	-0.03
Observations	561	414	406	357

Difference between control and treatment group for each variable. Positive (negative) numbers indicate that the value is larger (smaller) for the control group than for treatment group. Control is the group in which respondents are asked about income in many brackets and treatment is the group in which they are asked in terciles.

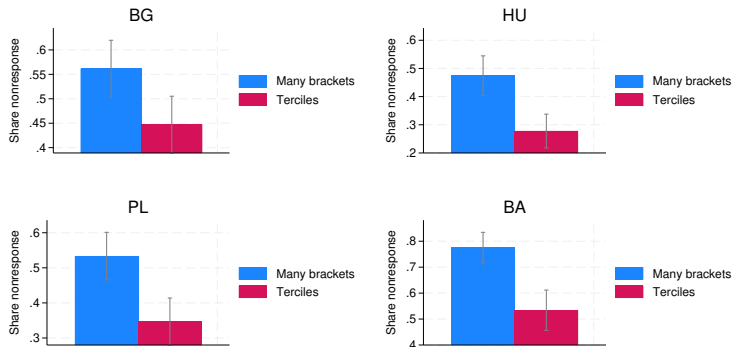
\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## Main results



# Hypothesis 1: nonresponse is reduced significantly

## Nonresponse to household income



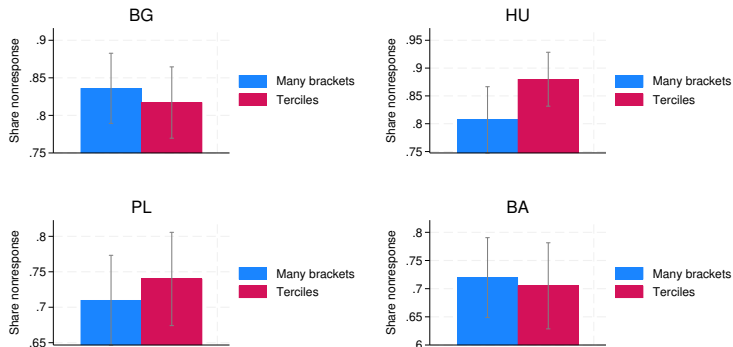
Source: OeNB Euro Survey 2023.

Note: Confidence intervals are obtained using two-sided t-tests.

⇒ Reduction between 11-23 percentage points

# Hypothesis 2: no positive spillovers

## Nonresponse to personal income amounts



Source: OeNB Euro Survey 2023.

Note: Confidence intervals are obtained using two-sided t-tests.

⇒ No reduction for reporting exact amounts in later questions

## Exploratory analyses

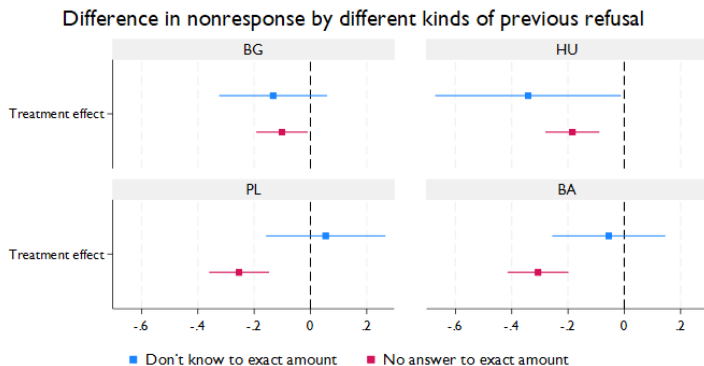
# Heterogeneous treatment effects?

In all countries, there are no differences across:

- Gender (female vs male)
- Age (young vs old)
- Education (non-tertiary vs tertiary)
- Being the household head or not
- Trusting other people or not

# Not able or not willing to tell?

In BA and PL, those who previously said “no answer” are more likely to answer in comparison to those who said “don’t know”

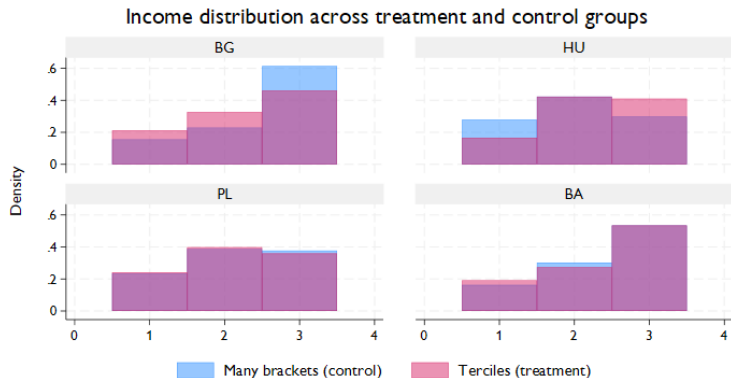


Source: OeNB Euro Survey 2023.

Note: Graphs plot the estimates from t-tests on the difference in nonresponse between treatment and control, separately for those who previously answered “don’t know” or “no answer” when asked about the exact income amount. Negative coefficients indicate that nonresponse was lower in the treatment group.

# Effects on the income distribution

In BG, high-income respondents seem to react less to the treatment; in contrast, in HU, high-income people are more willing to answer

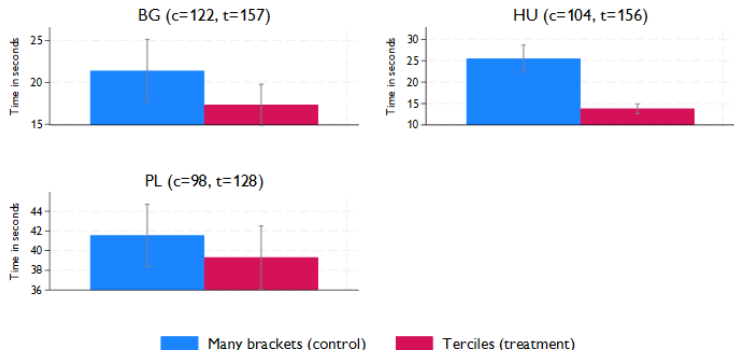


Source: OeNB Euro Survey 2023.

Note: Bars indicate the share of people in each pre-defined income tercile under control and treatment respectively. Necessarily, only those who eventually provided an income are included.

# Why is the treatment effective?

## Time spent on question (only if answer was eventually not refused)



Source: OeNB Euro Survey 2023.

Note: Bars indicate the average time respondents needed to answer the control and treatment question respectively. Only those included who did not refuse either control or treatment question. Number of observations in parentheses. Confidence intervals are obtained using two-sided t-tests.

There is clearly one caveat: the information is less accurate

- However, we mostly code income as low, medium and high for our analyses (also due to the high nonresponse)
- We plan to impute exact income with the answers from control and treatment and to test whether it makes a difference

There is another caveat: one has to pre-define the terciles

- This is especially difficult because of the high wage growth in our countries
- However, this is exactly the reason why the number of brackets have grown substantially over the years

⇒ Defining bounds was previously an issue and it stays an issue



# Summary

- There are several approaches to reduce income nonresponse in surveys but they are rarely tested in a rigorous way
- We conduct a randomized survey experiment in four countries
- Our treatment reduces complexity substantially by asking income in three brackets (terciles) instead of more than 20
- The direct nonresponse is reduced drastically:  
in every country by more than ten percentage points
- There are no spillovers on answering exact income amounts
- There are not much heterogeneous effects, but in some countries, the income distribution changes significantly

THANK YOU!

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# Appendix

# Household income growth from 2022 to 2023

	BG		HU		PL		BA	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Income 2022	1946	1900	404669	390001	5686	5200	1122	1000
Income 2023	2061	1901	485301	450000	6669	6250	1396	1151
Growth rate (%)	5.9	0.0	19.9	15.4	17.3	20.2	24.4	15.1

Source: OeNB Euro Survey, waves 2022 and 2023. Notes: Values are shown in local currency, as reported by the respondents. Includes answers to exact income question and control group bracketed question.

# Household income tercile bounds

Table: Tercile bounds used for treatment group

	BG	HU	PL	BA
1. Tercile, lower bound	0 BGN	0 HUF	0 PLN	0 KM
2. Tercile, lower bound	1,601 BGN	320,001 HUF	4,800 PLN	901 KM
3. Tercile, lower bound	2,751 BGN	500,001 HUF	8,000 PLN	1,501 KM

Table: Tercile bounds calculated from 2023 data

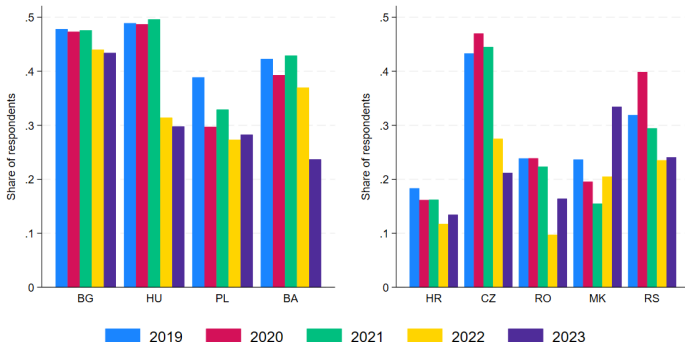
	BG	HU	PL	BA
1. Tercile, lower bound	0 BGN	0 HUF	0 PLN	0 KM
2. Tercile, lower bound	1,400 BGN	370,000 HUF	5000 PLN	850 KM
3. Tercile, lower bound	2,500 BGN	560,000 HUF	7,500 PLN	1,600 KM

Notes: Bounds calculated from the data collected in 2023 including the exact income question and the control group treatment of granular brackets. For bracketed questions, mid-points of the bracket are used.

# Personal income: nonresponse in previous waves

*“And, what is your personal total monthly income after taxes? If you cannot provide an exact amount, an approximate answer would also be helpful.”*

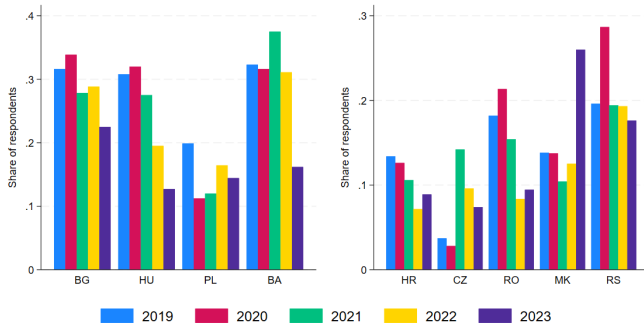
Nonresponse to exact personal income amounts



Source: OeNB Euro Survey, waves 2019-2023.  
2021 might not be comparable as income was asked differently.

# Personal income: overall nonresponse

## Nonresponse to both personal income questions



Source: OeNB Euro Survey, waves 2019-2023.  
2021 might not be comparable as income was asked differently.

## Personal income: descriptive statistics

	BG	HU	PL	BA
Gender (f/m)	-0.01	-0.06	-0.03	0.07
Age (in years)	-0.78	-1.42	-0.89	-4.32**
Education (in categories)	0.12	-0.21*	0.12	-0.00
Main earner in household (0/1)	-0.02	-0.08	-0.02	0.04
Manages household finances (0/1)	0.04*	-0.02	-0.01	0.02
Respondent apprehensive (0/1)	0.04	0.08	-0.01	0.02
Size of Household	-0.00	0.22*	0.25**	0.03
Observations	497	360	319	285

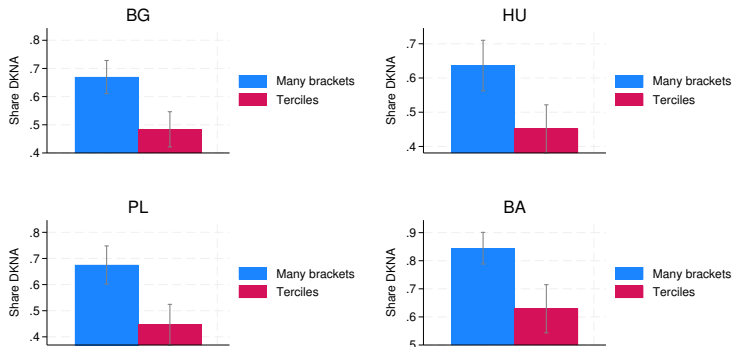
Difference between control and treatment group for each variable. Positive (negative) numbers indicate that the value is larger (smaller) for the control group than for treatment group. Control is the group in which respondents are asked about income in many brackets and treatment is the group in which they are asked in terciles.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$



# Personal income: hypothesis 1

## Nonresponse to personal income



Source: OeNB Euro Survey 2023.

Note: Confidence intervals are obtained using two-sided t-tests.

⇒ Reduction between 18-26 percentage points