

ZEW



# DISPARITIES IN FINANCIAL LITERACY, PENSION PLANNING, AND SAVING BEHAVIOR

Tabea Bucher-Koenen

*University of Mannheim and ZEW*

**Joint work with**

Andreas Hackethal, Johannes Kasinger, Christine Laudénbach

Netspar International Pension Workshop, 21.06.23

# OBJECTIVE

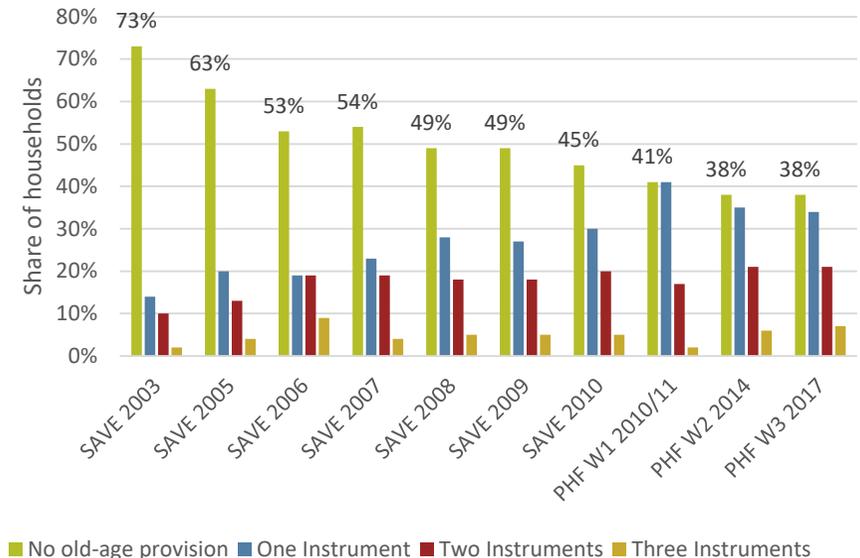
1. How can we support individuals when planning their pensions?
2. How can we design field experiments to estimate causal effects?
3. What do we need to consider when we design such experiments?

# MOTIVATION

## Recent trends in pensions:

- (1) Shift in responsibility for retirement income to the individual level
- (2) Increased complexity due to pension income from multiple sources

- Pension planning starts with **assessing the status quo** of pension claims, i.e. the retirement income individuals can expect given their current pension plans.
- Determining this status-quo may be a difficult task in a multi-pillar pension system.
- Digitalization is a way to make pension information more accessible.



Share of German households without supplementary old-age provision and by number of additional pensions

# MOTIVATION

## Recent policy initiatives to support individual pension planning:

- Germany: state-provided pension dashboard is expected to start in 2023
- UK: Pensions Dashboard in preparation for 2023
- Pension platforms active in Denmark (1999), Sweden (2004), Norway (2008), The Netherlands (2011)
- Brookings proposed the US to follow suit (John et al. 2020).

So far **little empirical evidence** on the effects of these platforms on pension planning and saving behavior.

**Research question:** *Does simplifying pension information help individuals, in particular those with low financial literacy, to improve their pension planning behavior and affect saving for retirement?*

# THIS PAPER IN A NUTSHELL

**Goal:** Test the effect of simplifying pension information on retirement planning and saving decisions, in particular for individuals with low financial literacy.

**Treatment:** *Pension Dashboard* – digital application that provides field study participants with an aggregated overview of their accumulated future pension claims across all three pillars of the pension system – public, occupational, and private.

**Approach:** *Field experiment* in cooperation with two large German banks. Combination of unique data from up to three surveys, pension contract data, and administrative panel data on account balances and transactions pre- and post experiment from the cooperating banks.

**Main result:** Access to the dashboard decreases self-reported uncertainty about future retirement income and *increases savings activity*, in particular among the low financially literate.

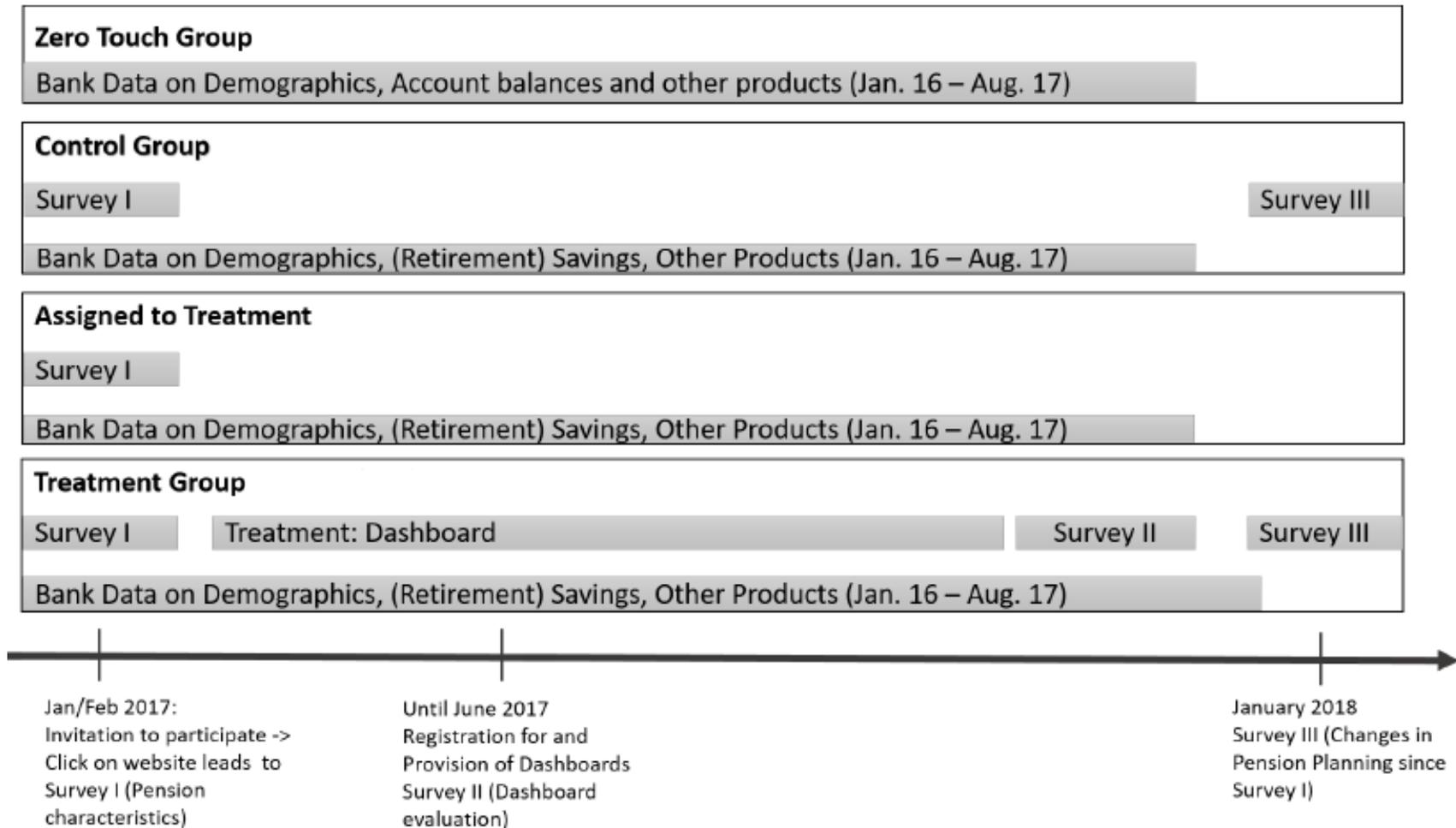
# LITERATURE

## *Selected works*

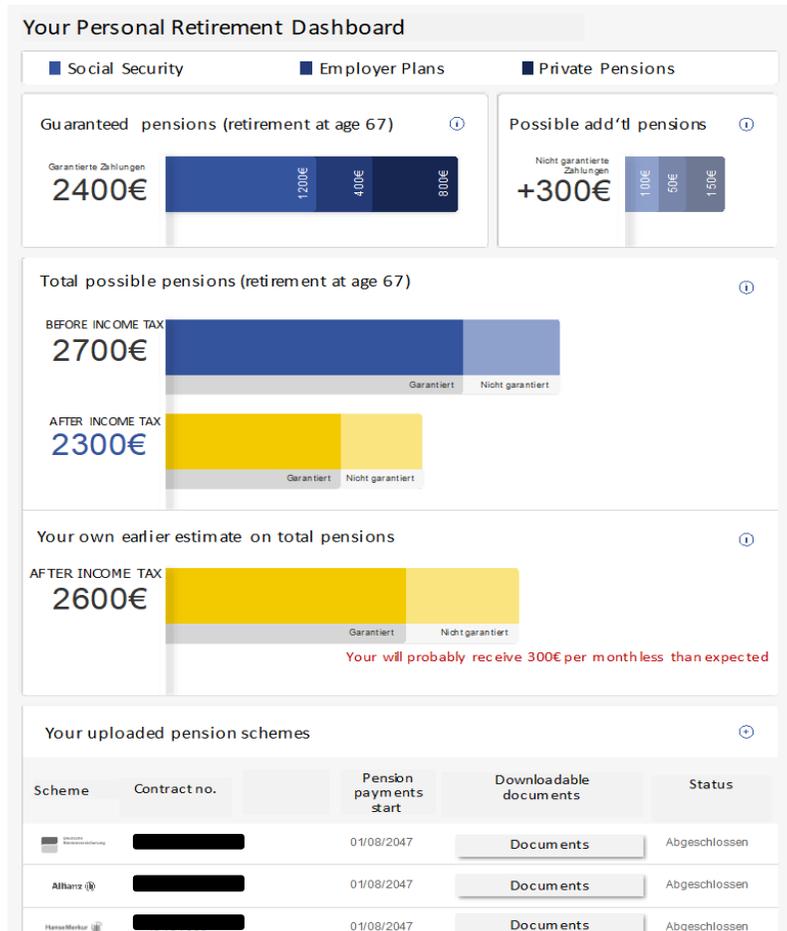
- **Financial literacy** causally affects **pension planning** and **wealth accumulation** (e.g. Behrman et al. 2012, Lusardi and Mitchell 2008).
- **Financial education** has a causal effect on **financial literacy and financial behaviors** (Kaiser et al. 2022).
- **Information** affects saving and investment behavior (e.g. Beshears et al. 2015, Chan and Stevens 2008)
- Personal **pension information** (e.g. personal information letters, retirement income projections and general information materials) **affect pension knowledge and saving behavior** (e.g. Dolls et al. 2018, Goda et al. 2014, Mastrobuoni 2011)

# THE FIELD EXPERIMENT

## Timing and experimental groups



# THE FIELD EXPERIMENT - TREATMENT



- ✓ Personalized information about future pension income from **all three pillars: public, private, occupational**
- ✓ Aggregated overview of all accumulated future pension claims (**gross and net** of taxes)
- ✓ Presentation of **guaranteed pension** and possible **additional income** from profit participation / interest payments / pension increases
- ✓ **Compilation of existing information**
- ✓ Participants uploaded on average 4.5 products
- ✓ Average projected retirement income 3,287 € (std. 1,985 €)
- ✓ Effort: about 24 min per dashboard

# IMPORTANT VARIABLES

## **Subjective pension overview**

"I have a good overview over my accumulated pension entitlements today" (1=fully disagree to 7=fully agree) measured in Survey I and III

## **Saving balance**

Savings account balance at the end of each month in Euros from administrative bank records for 12 months prior and up to 8 months after the intervention

## **Wealth**

Wealth is equal to the sum of savings account, transfer account, and portfolio balances from administrative bank records and available for 12 months prior and up to 8 months after the intervention

# IMPORTANT VARIABLES

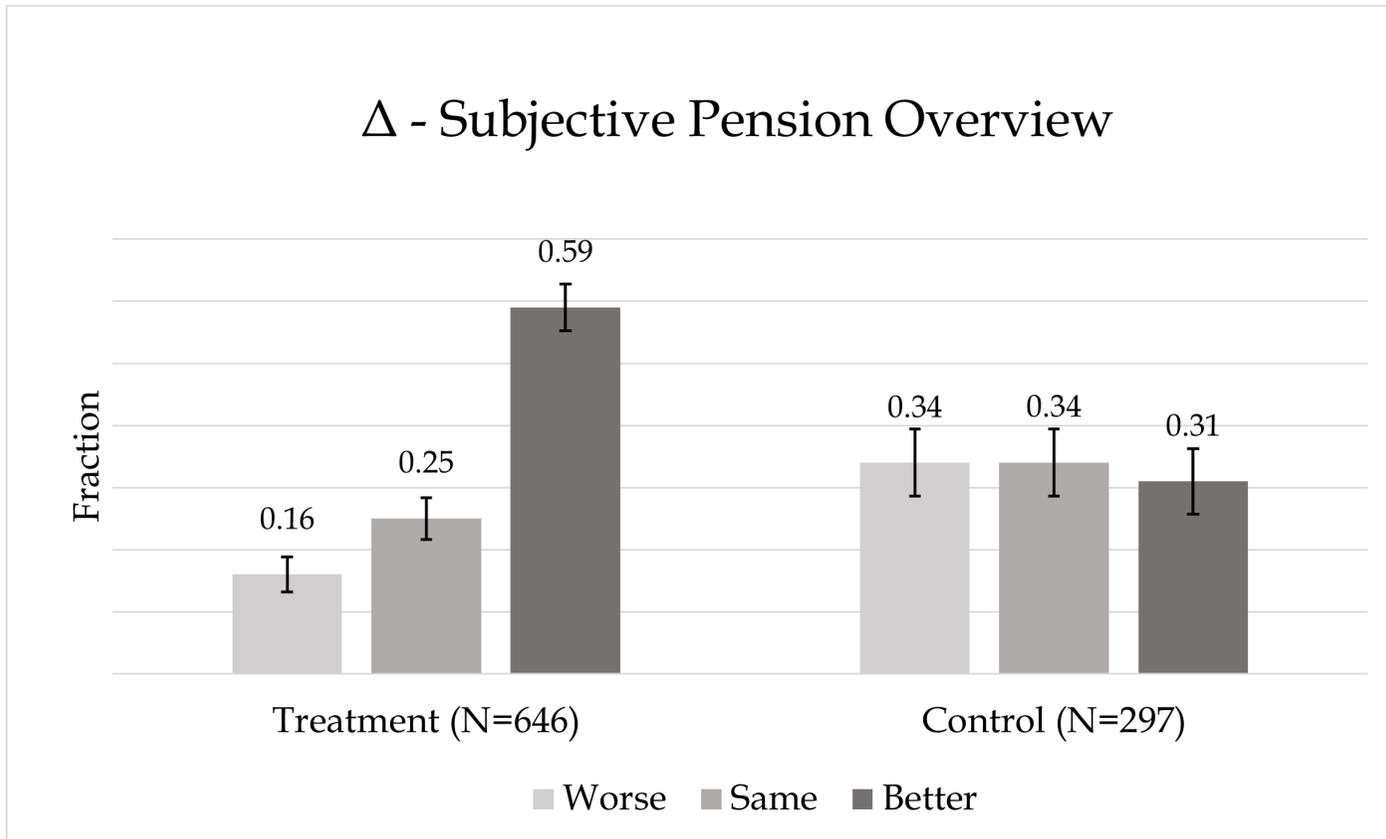
## Financial literacy

- Correct answers (one point per correct answer) to the Big Three financial literacy questions (Lusardi and Mitchell 2011, 2014)  
=> 82% of the respondents with three correct answers
- plus a fourth more difficult question on compounding interest (Goda et al. 2014)  
=> 43% correct answers
- In total 39% of the sample answer all four questions correctly
- Sample split: High literacy if all 4 questions answered correctly; low literacy if not all 4 questions answered correctly

# SUMMARY STATISTICS

Variable	Treatment	Control	Difference
Female	0.29 (0.46)	0.34 (0.47)	-0.044
Age	47.84 (7.94)	43.92 (9.65)	3.920***
Single	0.35 (0.48)	0.43 (0.50)	-0.070*
Saving account	0.57 (0.50)	0.64 (0.48)	-0.071*
Active saving account	0.51 (0.50)	0.57 (0.50)	-0.055
Savings balance in €	3,243 (12,134)	2,739 (10,280)	503
Wealth in €	24,207 (66,449)	21,296 (66,449)	2,911
Financial literacy score	3.36 (0.69)	3.15 (0.85)	0.217***
Pension overview	4.17 (1.68)	4.49 (1.96)	-0.315***

# MANIPULATION CHECK

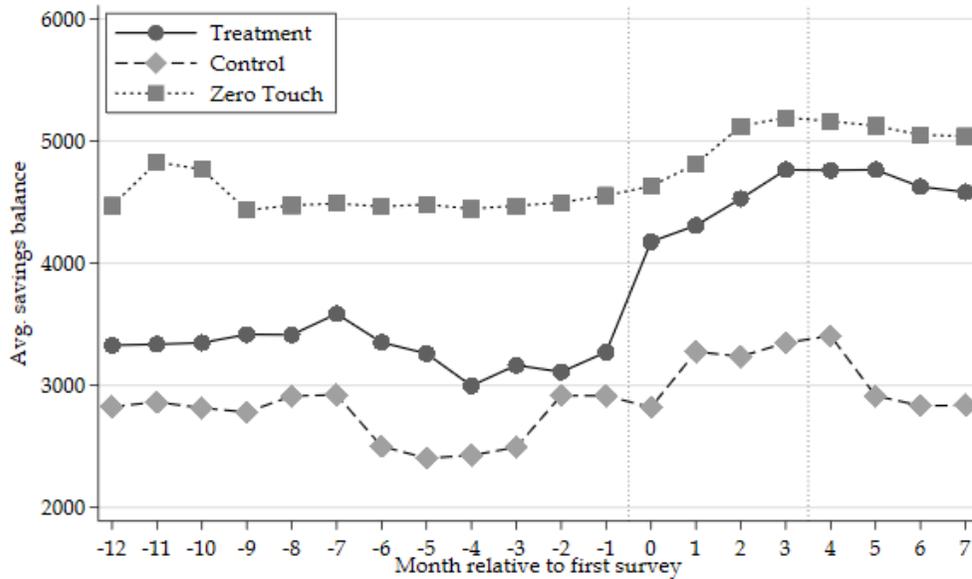


Subjective pension overview:

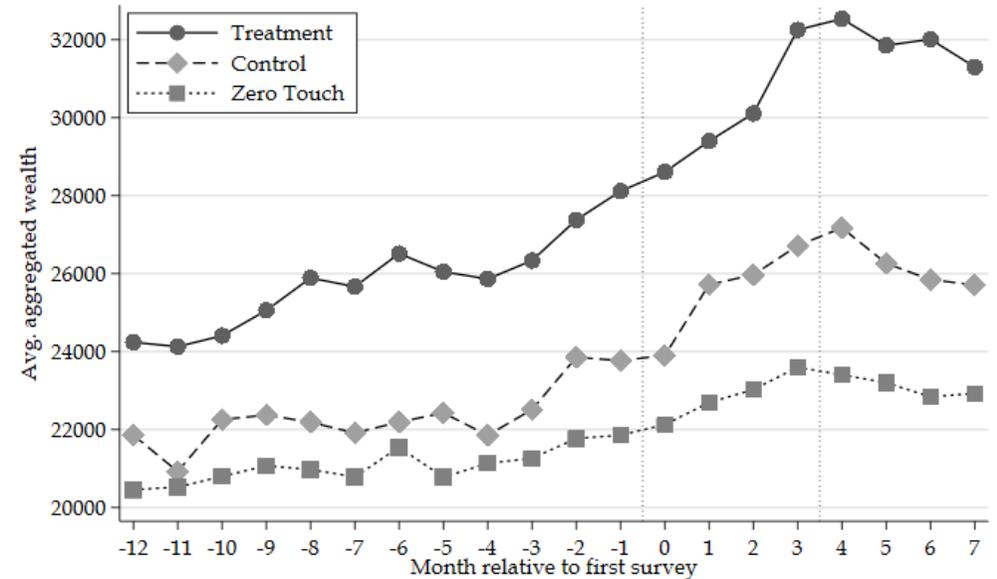
- No change in the control group
- Significant improvement in the treatment group

# AVERAGE SAVINGS BALANCES AND WEALTH

Saving balance (monthly in €)



Wealth (monthly in €)



# EMPIRICAL STRATEGY

## (1) DiD and (2) dynamic DiD:

Compare changes in saving balances and wealth before and after the treatment including time and individual fixed effects

$$Y_{i,t} = \alpha_i + \lambda_t + \sum_{k=-12}^7 \theta_k D_i^k P_i + \sum_{k=-12}^7 \beta_k D_i^k T_i + \epsilon_{i,t}$$

Individual fixed effects      Time fixed effects      time dummies interacted with a participation dummy (treat. + contr.)      time dummies interacted with a treatment dummy

Estimated for full sample and sub-samples of high and low financial literacy

# EMPIRICAL STRATEGY - IDENTIFICATION

## Self-selection into treatment

- (1) Selection into participation => external validity
- (2) Selection into treatment (compliance)
  - all differences in time-fixed unobservable characteristics are absorbed by the individual fixed effects
  - critical assumption: parallel trends → see estimation results later
  - ITT (causal effect of a treatment offer) → effect is likely to be small, because of small fraction of compliers (14.5%).

## Saving adjustments in other accounts/outside the bank

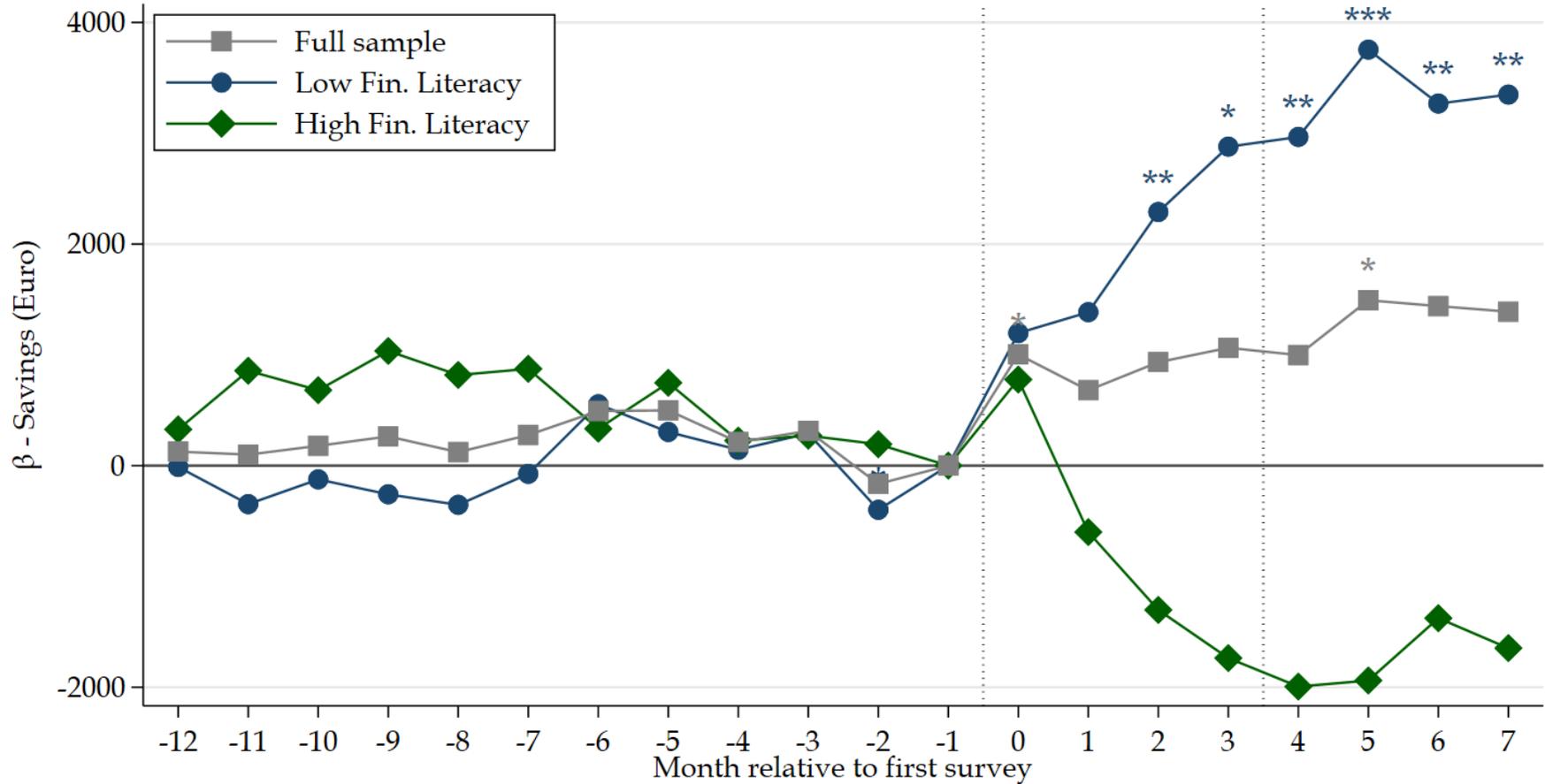
- Similar effects for wealth (saving accounts are main driver of adjustments)
- Similar (or even larger) effects for subsample of active savers
- If there are large adjustments outside of the accounts with the main bank, then our estimates are very conservative.

# RESULTS: AVERAGE TREATMENT EFFECTS

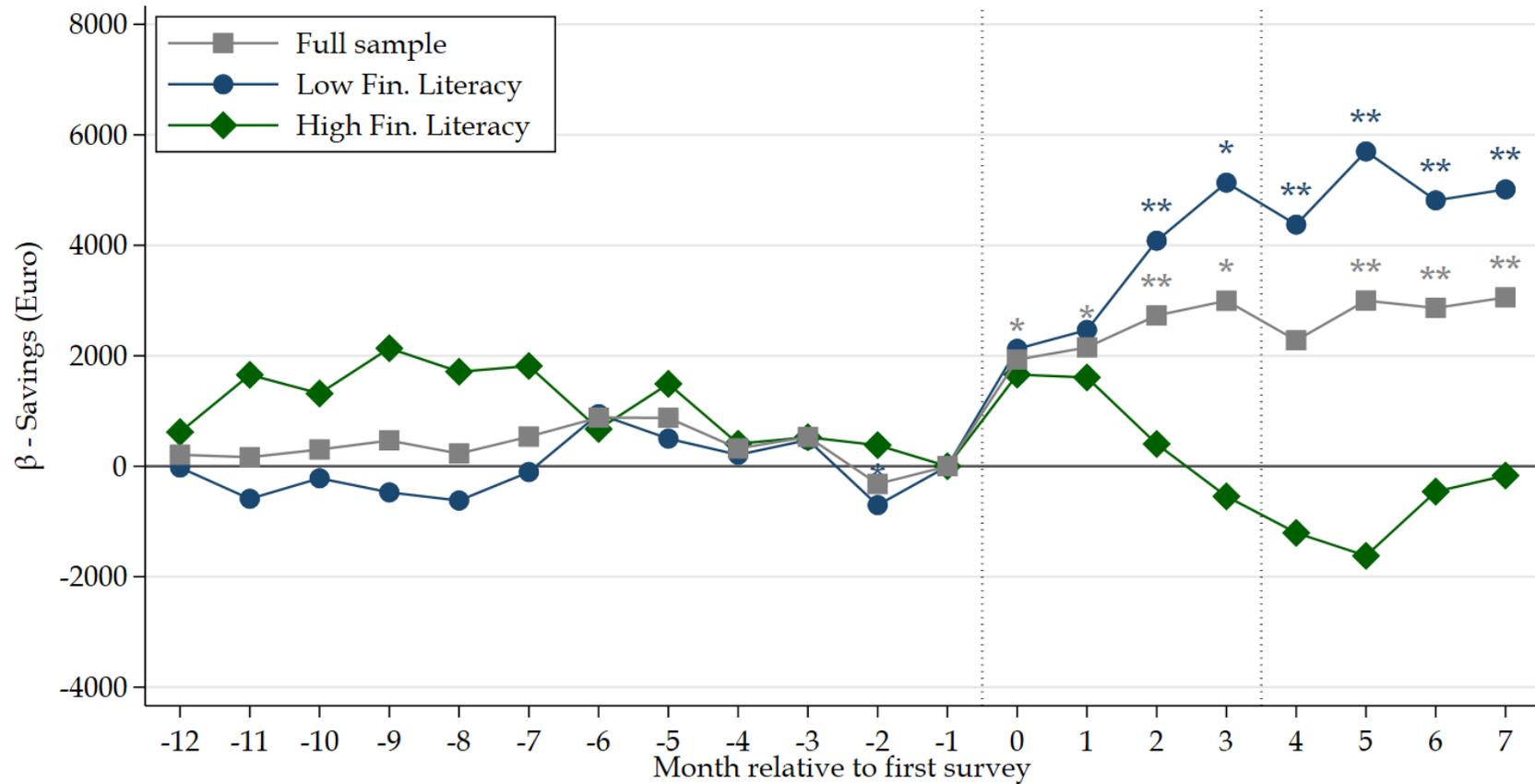
Table 2: Average treatment effects for different wealth measures

	(1)	(2)	(3)	(4)	(5)	(6)
	All clients				Active Savers	
Dep. variable	Savings	Wealth	Net wealth	Savings and portfolio acc.	Savings	Wealth
<b>Panel A: Full sample</b>						
Treatment Effect	1,126.89 (1.16)	1,984.47 (0.99)	3,231.26 (1.26)	1,706.05 (0.88)	2,444.32 (1.56)	4,549.91* (1.91)
N	11,846	11,846	11,846	11,846	6,392	6,392
<b>Panel B: Low financial literacy</b>						
Treatment Effect	3,354.13** (2.38)	4,382.34** (2.05)	6,202.38** (2.11)	4,076.53** (2.00)	5,018.68** (2.16)	6,682.29** (2.03)
N	7,270	7,270	7,270	7,270	4,188	4,188
<b>Panel C: High financial literacy</b>						
Treatment Effect	-2,265.17 (-1.56)	-2,410.17 (-0.53)	-1,883.76 (-0.37)	-2,557.09 (-0.57)	-1,924.59 (-1.38)	285.98 (0.09)
N	4,576	4,576	4,576	4,576	2,204	2,204
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes

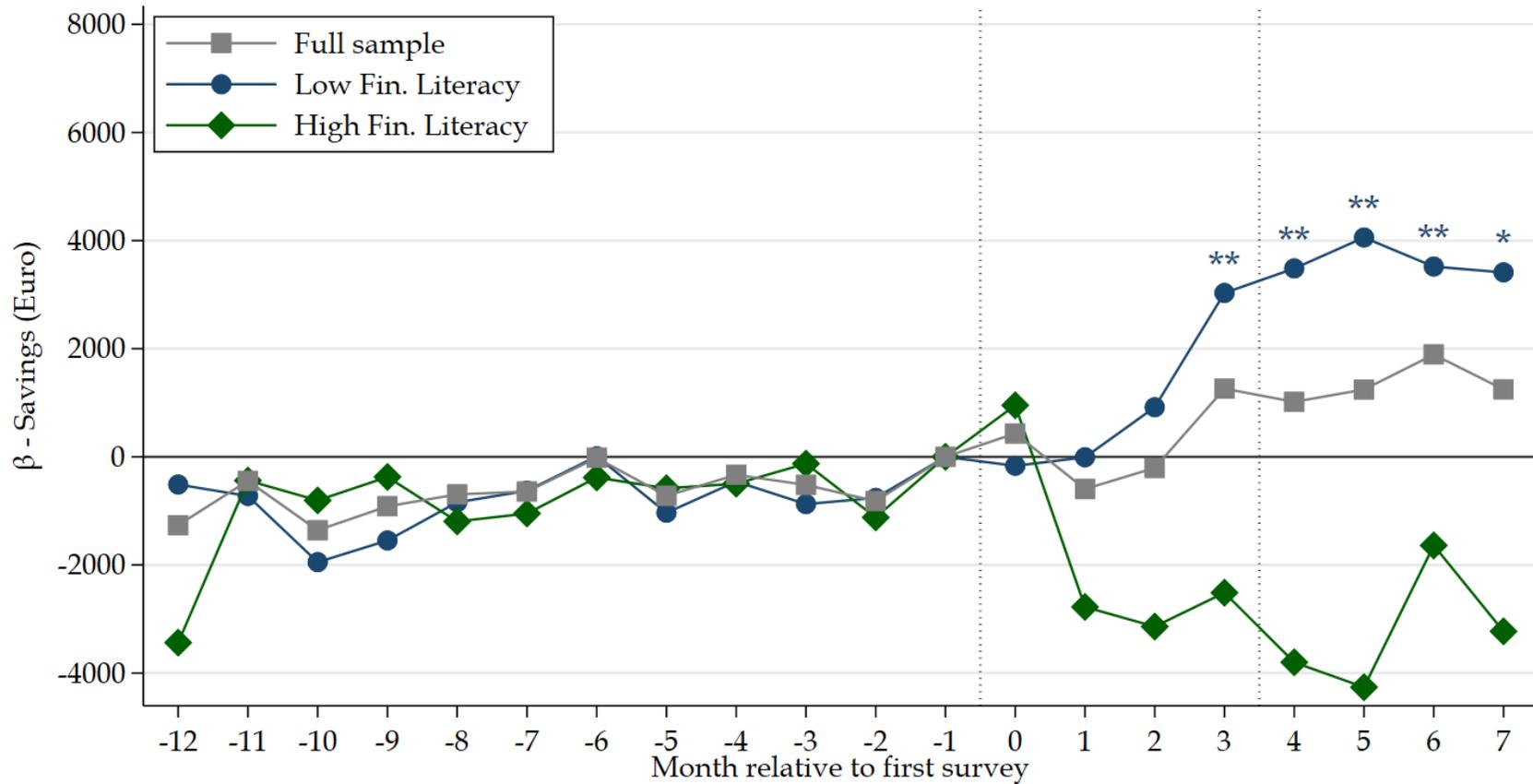
# TREATMENT EFFECTS OVER TIME



# TREATMENT EFFECTS ACTIVE SAVERS



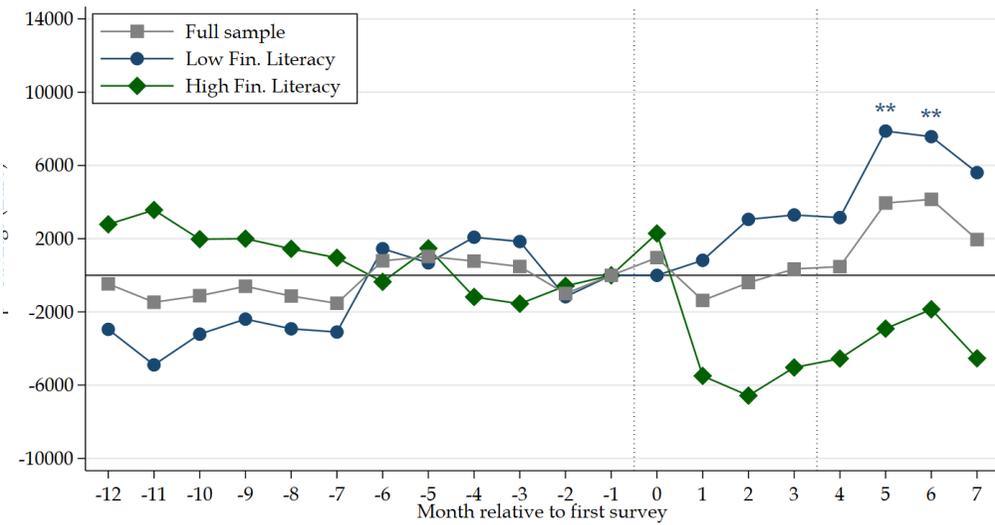
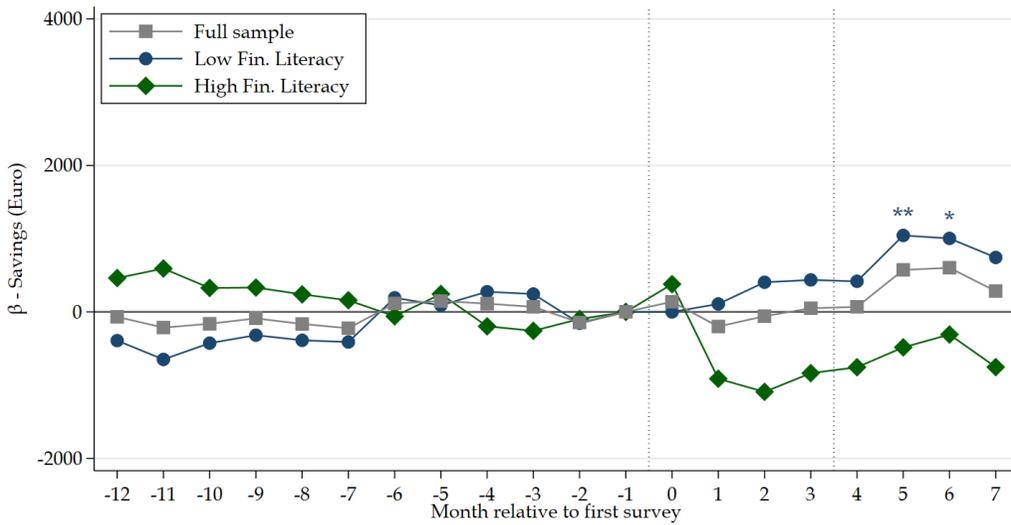
# EFFECTS ON TOTAL WEALTH



# INTENTION TO TREAT EFFECTS

ITT (reduced from effect)

TOT - Treatment effect on the treated



# ROBUSTNESS

## 1. Effects are robust

- To using a measure of subjective financial literacy
- To using alternative measures of wealth and savings

2. Effects are not driven by individuals who start looking for pension documents but fail to complete the process (dashboard effect instead of salience effect).

## 3. Trimming and Winsorization:

- Trimming along average pre-intervention saving account balances
- Trimming saving adaptations
- Winsorizing monthly saving balances

=> Effects remain for 1%/99% cuts; but become weaker or insignificant for 5%/95% cuts.

# CONCLUSION

## Results

1. Access to the pension dashboard decreases uncertainty about future retirement income and increases savings and wealth.
2. Effects are particularly strong among individuals with low financial literacy.

## Caveat “External validity”

- Participants have high financial literacy / complex pension portfolios / high wealth => groups which have a high propensity to plan.
- Reaching individuals with low financial literacy / low propensity to plan is a major challenge => **more research (!)**

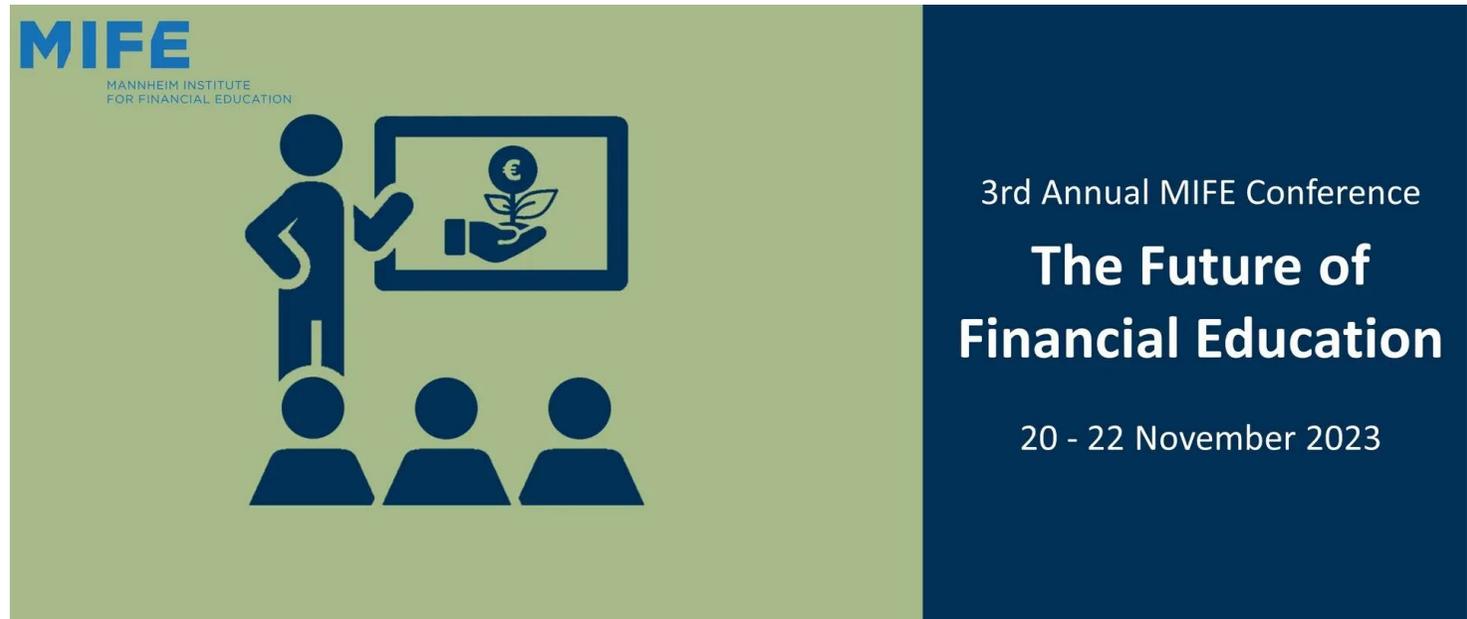
## Conclusion

- Providing better pension information has the potential to mitigate retirement planning disparities.
- More research is necessary in order to understand how to reach hard-to-reach-groups.

# CONTACT

Tabea Bucher-Koenen

[Tabea.bucher-koenen@zew.de](mailto:Tabea.bucher-koenen@zew.de)



<https://www.uni-mannheim.de/en/mife/about-mife/>

# CLASS ASSIGNMENT

## Student presentations:

- We will have student presentations of recent academic papers
- Each presentation has 10 minutes (5 min for presentation and 5 min for discussion and questions)
- Each paper has to be prepared by a group of 2 or 3 students.
- You can either select one presenter or present jointly.
- Presentation can be informal. Please provide
  - A short summary of the main result and the main contribution of the paper
  - Your thoughts on whether the paper convinces you?, what could be improved? Does it provide ideas for further research?

# CLASS ASSIGNMENT

1. Deuflhard, Florian, Dimitris Georgarakos, and Roman Inderst. 2019. "Financial Literacy and Savings Account Returns," *Journal of the European Economic Association*, Volume 17, Issue 1, Pages 131–164, <https://doi.org/10.1093/jeea/jvy003>
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4. Frisancho, Veronica. 2020. The impact of financial education for youth, *Economics of Education Review* 78.
5. Jha, Saumitra, and Moses Shayo. 2021. "Trading Stocks Increases Financial Literacy and Compresses the Confidence Gender Gap." Stanford University Graduate School of Business Research Paper No. 3673.
6. Francesco D'Acunto, Nagpurnanand Prabhala, Alberto G Rossi, 2019. "The Promises and Pitfalls of Robo-Advising," *The Review of Financial Studies*, Volume 32, Issue 5, 2019, Pages 1983–2020, <https://doi.org/10.1093/rfs/hhz014>