

Premium Programs and Energy-Saving Intentions

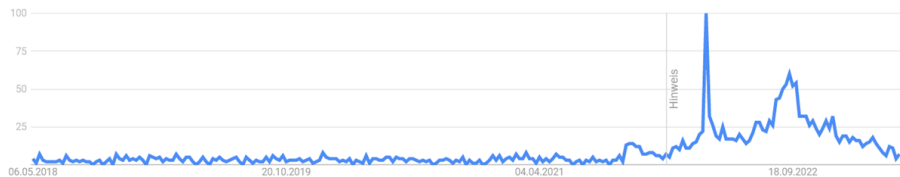
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Google Trends for the keyword: "energy cost"

Interesse im zeitlichen Verlauf ?



Motivation

- Policy makers concerned about gas scarcity
- Main concern: insufficient savings by private households
- Heated debate about additional incentives through savings premiums
 - Self-selection into energy-efficiency programs and question of additionality of energy-efficiency subsidies (Boomhower and Davis 2014; Houde and Aldy 2017)

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This paper

Conducts an incentivized experiment about a savings premium program to

...

... quantify the population shares of **“always-takers”**, **“compliers”** and **“never-takers”** of pursuing an energy-savings target

... estimate the smallest **savings premium** that makes households follow more ambitious targets

Research Questions

What are the incentive effects of energy savings premiums?

- ① How large is the fraction of consumers who would sign up for a premium?
- ② What are the incentive effects of different designs of the premium, such as varying premium amounts or targets?
- ③ Additionality of goal-setting?

Data and experimental design

- Second survey wave of German Heating and Housing Panel (GHHP) conducted between end of September and early November 2022

Summary

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Option A:

Unconditional payment of 100 EUR.

Option B:

Payment of **X EUR** if savings target of **Y kWh** is met.

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Option A:

Unconditional payment of 100 EUR.

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Payment of **X EUR** if savings target of **Y kWh** is met.

- **Random premium X:** from 100 to 1.500 Euro
- **Random savings target Y:** 700, 1.400, 2.800 oder 4.200 kWh (5, 10, 20 and 30% of av. annual gas consumption (BDEW 2022))
- Payment implemented for one randomly determined participant in May 2023

Conceptual Model of Saving Premium Choice

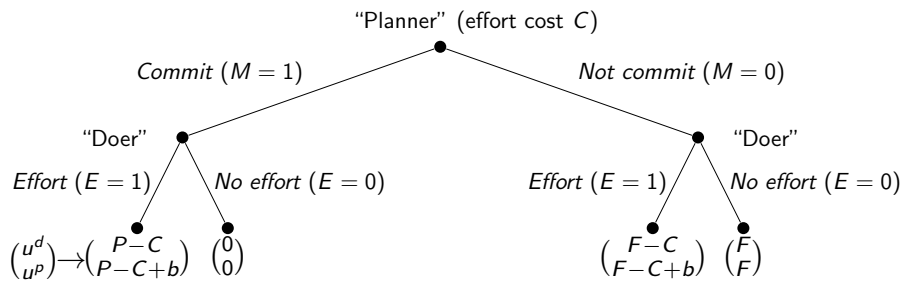
- Net effort cost of reaching a target: $C \sim (0, \infty)$
- Benefit of reaching a target: premium P

Intrapersonal two-stage game between a “planner” (T0) and a “doer” (T1).

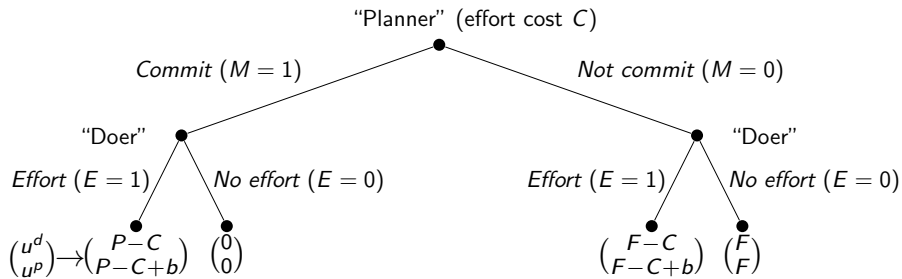
- T0: Planner decides whether to commit to the savings goal ($M = 1$) or not ($M = 0$)
- T1: Doer decides whether to exert effort ($E = 1$) or not ($E = 0$)

- Under commitment, reaching the target yields ...
 - ... $U^P = P - C + b$ for the planner
 - ... $U^d = P - C$ for the doer
- Under no commitment, **fixed payment** $F \leq P$

Conceptual Model of Saving Premium Choice



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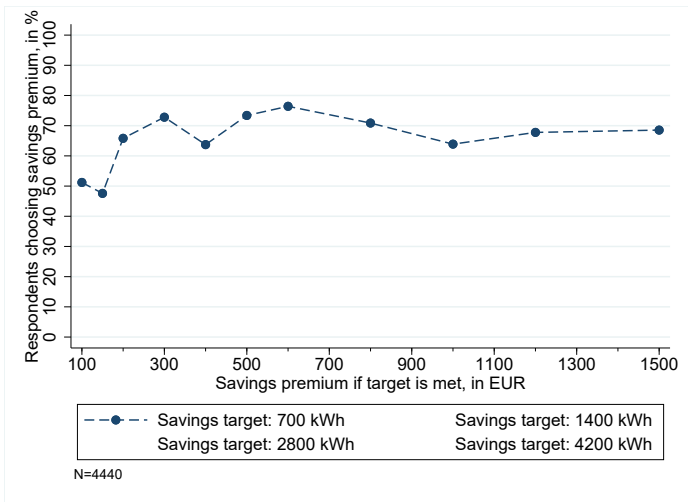


- A planner commits only if $C < P - F + b$ (which implies $0 < C < b$ when $P = F$).

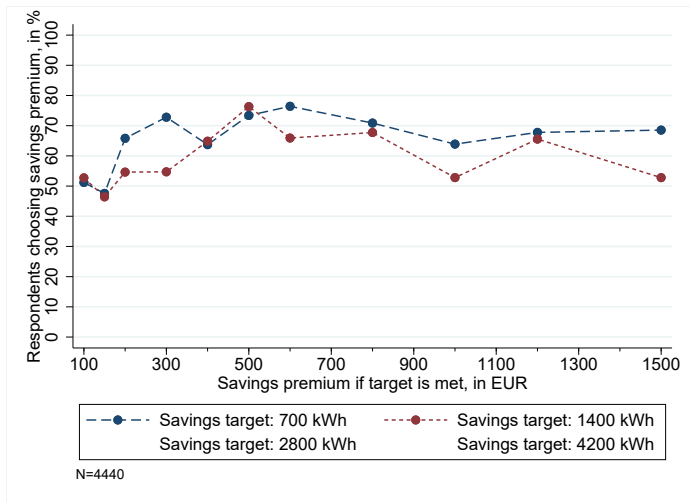
Group	Choice	Response Mechanism
Always-takers	Commit if $P = F$	Target as commitment device: $b > 0$
Compliers	Commit if $F < P < \bar{P}$, but not if $P = F$	Financial reward
Never-takers	Do not commit if $P = \bar{P}$	No response

Results

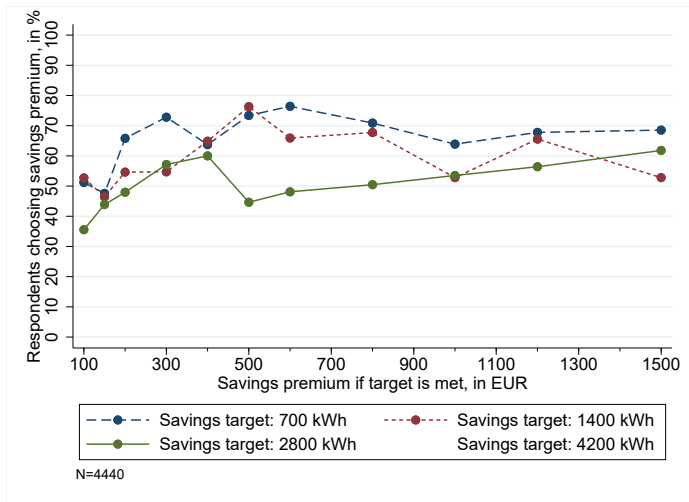
Experimental Outcomes



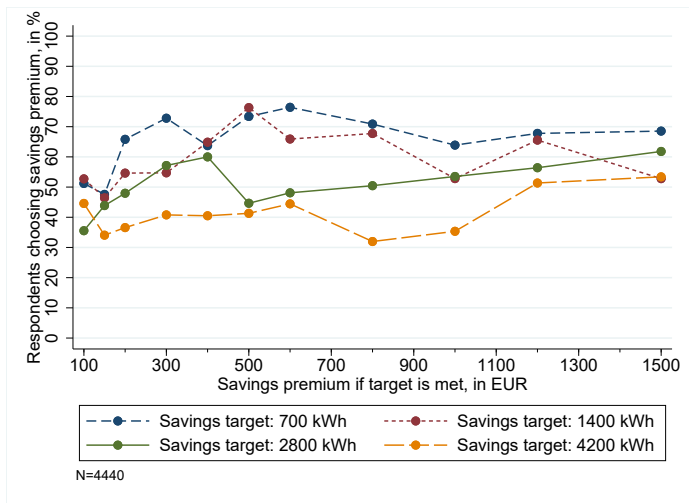
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Regression Results

We regress the decision to opt for the savings premium ($Y_i = 1$) on the premium and the target:

$$Y_i = \alpha + \beta \text{Premium}_i + \gamma \text{Target}_i + \epsilon_i.$$

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	(1)		(2)		(3)	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Premium = 100	0.468	(0.025)	-	-	-	-
Premium > 100 & < 1500	0.552	(0.008)	-	-	-	-
Premium = 1500	0.582	(0.024)	-	-	-	-
(4) Savings premium difference, in 1000 EUR	-	-	0.074	(0.017)	0.074	(0.017)
Savings target 1400 kWh	-	-	-0.061	(0.020)	-	-
Savings target 2800 kWh	-	-	-0.144	(0.020)	-	-
Savings target 4200 kWh	-	-	-0.244	(0.021)	-	-
(8) Savings target difference, in 1000 kWh	-	-	-	-	-0.068	(0.005)
Constant	-	-	0.616	(0.016)	0.611	(0.014)
Number of observations	4440		4440		4440	
Equivalent premium: (8)/(4), in EUR/kWh						0.92

Notes: Robust standard errors are in parentheses. Savings premium difference denotes the difference of the observed savings premium relative to the lowest premium of 100 EUR, in 1000 EUR.

Discussion

Results raise doubts regarding the cost effectiveness of generous premium programs

- Low percentage of “compliers” (**11%**) who change their energy-saving intentions in response to higher premiums
- High percentage of “always-takers” (**47%**) who follow savings target irrespective of savings premium (windfall gains)

Setting up behaviorally motivated programs that support goal setting and self commitment may be more (cost-)effective.

Thank you! Questions or comments?
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Summary Statistics

Table: Summary Statistics for the Estimation Sample

	Mean	Std. Dev.	Min	Max
Socio-economic characteristics:				
Homeowner	0.71	–	0	1
Age	56.2	13.7	18	91
Female	0.38	–	0	1
Household size	2.32	1.06	1	5
Monthly household net-income	3,894	1,432	700	5,950
College degree	0.43	–	0	1
Rather left	0.27	–	0	1
Rather right	0.06	–	0	1
Environmental attitudes	25.13	4.08	5	30
Internal Locus of Control	35.11	7.30	0	49
Building characteristics:				
Floor area	121.3	50.9	15	903
Built after 2002	0.15	–	0	1
Single-family house	0.68	–	0	1
Solar thermal system	0.14	–	0	1
Photovoltaics	0.15	–	0	1
Heating characteristics and attitudes:				
Annual cost for heating and warm water, in Euro	2,340	1,841	0	6,800
Planned reduction of heating consumption	0.91	–	0	1
Agreed: High energy cost in Germany	0.95	–	0	1
Agreed: Heating energy cost will increase	0.49	–	0	1
Agreed: Ability to control energy consumption	0.58	–	0	1