Financial policy from behavioural science collaborations in the field

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Today

- Using bank account data we find gambling displaces savings and investments, and is not a substitute for leisure activity (industry narrative) or essential spending (lived experience narrative)
- Using linked pension and credit file data we find auto enrolment into workplace pensions increased unsecured debt
- In an RCT with a large stockbroking platform, we find adding information to risk warnings greatly increases investment

Gambling displaces savings and investments rather than consumption in bank transaction records

Steven Murphy
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Today

We find gambling displaces savings and investments, and is not a substitute for leisure activity (industry narrative) or essential spending (lived experience narrative).

Context

Money

In 2019, over 24 million UK individuals lost £14.5 billion to bookmakers, casinos, lotteries, etc.

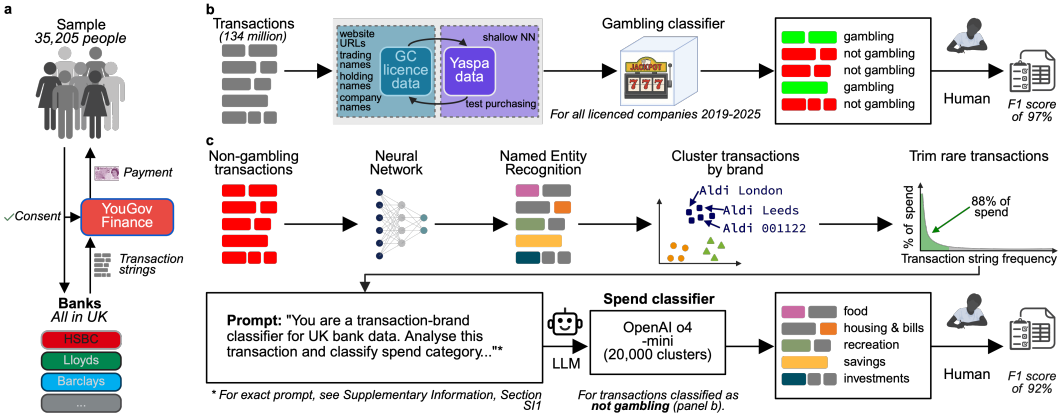
In the UK, gambling losses are about the same size as the cost of credit cards

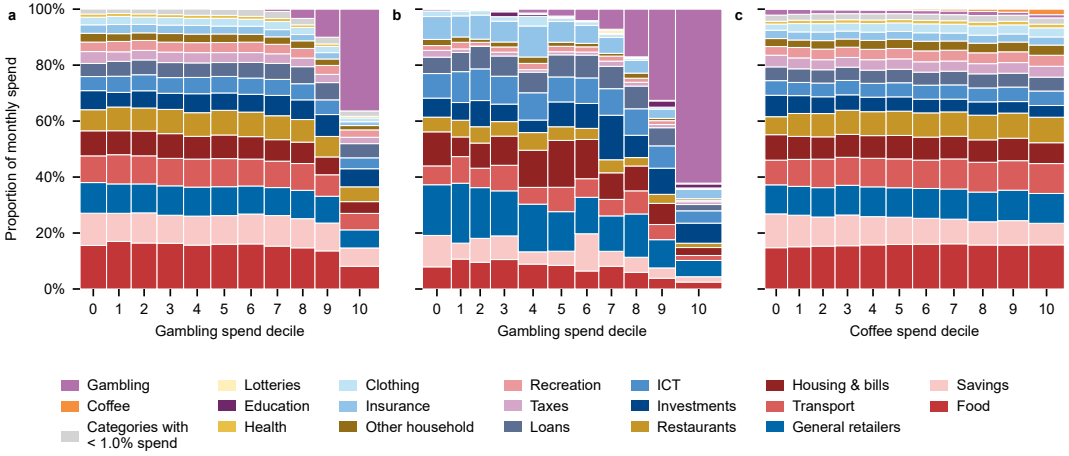
People

The number of active online gambling accounts in the UK nearly doubles from 16 million in 2008 to 30 million in 2019

8.8 million households have a mortgage

35 million people in the UK have at least one credit card


a
Sample
35,205 people
Payment
Consent
YouGov Finance
Transaction strings
Banks
All in UK
HSBC
Lloyds
Barclays
...
b
Transactions
(134 million)
website URLs
trading names
holding names
company names
GC licence data
shallow NN
Yaspa data
test purchasing
Gambling classifier
For all licenced companies 2019-2025
gambling
not gambling
not gambling
gambling
not gambling
Human
F1 score of 97%
c
Non-gambling transactions
Neural Network
Named Entity Recognition
Cluster transactions by brand
Aldi London
Aldi Leeds
Aldi 001122
Trim rare transactions
% of spend
88% of spend
Transaction string frequency
Prompt: "You are a transaction-brand classifier for UK bank data. Analyse this transaction and classify spend category..."*
LLM
Spend classifier
OpenAI o4 -mini (20,000 clusters)
food
housing & bills
recreation
savings
investments
Human
F1 score of 92%
* For exact prompt, see Supplementary Information, Section SI1
For transactions classified as not gambling (panel b).


a
b
c
Proportion of monthly spend
100%
80%
60%
40%
20%
0%
0 1 2 3 4 5 6 7 8 9 10
Gambling spend decile
Gambling spend decile
Coffee spend decile
Gambling
Coffee
Categories with < 1.0% spend
Lotteries
Education
Health
Clothing
Insurance
Other household
Recreation
Taxes
Loans
ICT
Investments
Restaurants
Housing & bills
Transport
General retailers
Savings
Food

A
Savings
Investments
Transport
General retailers
Taxes
Loans
Food
Restaurants
Housing & bills
Other household
Insurance
Clothing
Recreation
ICT
Lotteries
Education
Pensions
Health
Donations
Alcohol, etc
Cr. card fees & int.
£0.00
-£0.10
-£0.20
-£0.30
-£0.40

B
Savings
Investments
Housing & bills
Insurance
General retailers
Loans
Taxes
Transport
ICT
Restaurants
Education
Clothing
Other household
Food
Recreation
Health
Lotteries
Pensions
Alcohol, etc
Donations
Cr. card fees & int.
$0.00
-$0.10
-$0.20
-$0.30
-$0.40

Conclusion

57% of estimated displacement falls on savings and investment contributions. Individuals trade future financial security for immediate risk taking for negative expected returns

Gambling expenditure is not primarily associated with reductions in essentials or other discretionary spending

Patterns replicate remarkably across 35,205 UK and 11,133 US account holders

The reallocation of spending toward gambling increase measured UK economic output by £1.4 billion—an apparent macroeconomic gain that must be weighed against reduced household resilience

We suggest reframe gambling as an intertemporal financial decision rather than a leisure choice

Does Pension Automatic Enrolment Increase Debt? Evidence from a Large-Scale Natural Experiment

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John Gathergood David Laibson Richard Notley Jesal D. Sheth
Will Sandbrook Neil Stewart

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Introduction

Automatic enrolment of employees into workplace pensions is among the most widely adopted policy nudges (Thaler & Sunstein, 2009)

- Implemented in US, UK, New Zealand, Turkey
- Successful at increasing pension coverage and new saving within the pension created by automatic enrolment
  - Beshears et al. (2009), Cribb & Emmerson (2016)
- However, effects of automatic enrolment could be offset on other margins of adjustment

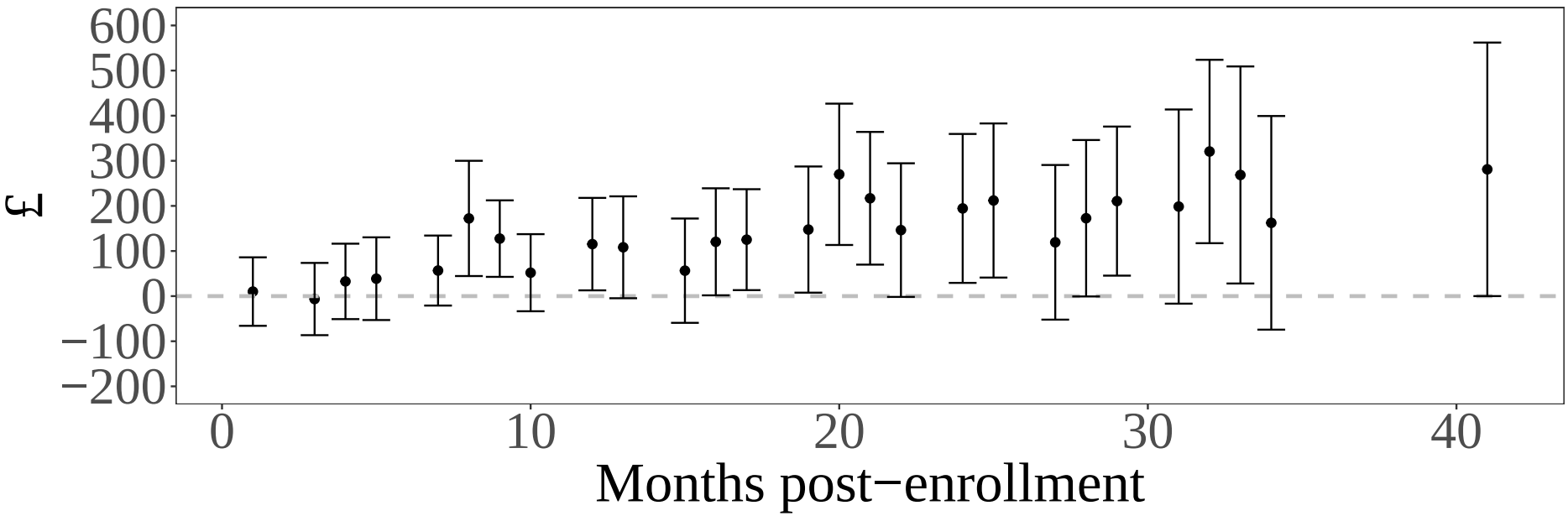
Table 2: Firm Staging Dates (30 Employees)

Final two PAYE digits	Staging date
92*	Jun 1, 2015
02-04	Jan 1, 2016
00, 05-07	Feb 1, 2016
01, 08-11	Mar 1, 2016
12-16	Apr 1, 2016
17-22	Jun 1, 2016
23-29	Jul 1, 2016
30-37	Aug 1, 2016
38-46	Oct 1, 2016
47-57	Nov 1, 2016
58-69	Jan 1, 2017
70-83	Feb 1, 2017
84-91, 93-99	Apr 1, 2017

Note: Jun 2015 was a small 'pathfinder' trial cohort

Total Unsecured Debt (£)

Figure 3: Total Unsecured Debt



▸ Vehicle Debt

Model Estimates

Table 9: OLS MPE Regression Estimates: Cumulative Contributions

	Total (£) (1)	Employer (£) (2)	Employee (£) (3)	Tax relief (£) (4)
Months post-enrollment	29.32***	14.95***	11.53***	2.870***
	(0.4712)	(0.2963)	(0.1990)	(0.0499)
Observations	1,949,241	1,949,241	1,949,241	1,949,241
Year fixed effects	✓	✓	✓	✓
Gender fixed effects	✓	✓	✓	✓
Age fixed effects	✓	✓	✓	✓

Model Estimates

Table 10: Treatment Effects on Unsecured Debt

	Debt balance			Has debt balance x 100		
	Total (£)	Revolving (£)	Non-revolving (£)	Total	Revolving	Non-revolving
	(1)	(2)	(3)	(4)	(5)	(6)
Months post-enrollment	7.172***	1.616	5.556***	0.0025	-0.0109	0.0163
	(2.545)	(1.196)	(1.907)	(0.0148)	(0.0154)	(0.0141)
Observations	1,949,241	1,949,241	1,949,241	1,949,241	1,949,241	1,949,241
Year fixed effects	✓	✓	✓	✓	✓	✓
Gender fixed effects	✓	✓	✓	✓	✓	✓
Age fixed effects	✓	✓	✓	✓	✓	✓

Results Summary

Estimates suggest contributions are partially offset by higher mortgage and unsecured debt balances

- Per month, total contributions increase by £29.30, of which
  - £15.00 is the employer contribution
  - £11.50 is the employee contribution
  - £2.90 is tax relief
- Partially offset by unsecured debt
  - Per month, unsecured debt increases by £7.20
  - Of which approximately £5.60 is non-revolving debt
- Partially offset by mortgage debt
  - Increased likelihood of mortgage holding
  - Increased average mortgage balances (slightly)

The Equity Premium in Plain Sight: Disclosure, Beliefs, and Stock Market Participation

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Introduction

Low rates of stock ownership in the population despite the equity premium is a persistent puzzle in economics and finance (Bertaut et al., 1998; Haliassos & Bertaut 1995):

- US SCF 2022: 58% of households own stocks, 21% directly (Pew, 2024).[1]
- Stockholding rates are lower in other economies: Canada 49%, Australia 37%, UK 33% ... France 15%, Germany 14%, China 7% (HelloSafe, 2025).[2]
- Stockholding rates unchanged since early 2000s, despite continued equity premium (Pew, 2024).

$\rightarrow$ Understanding the causes, and solutions, to low participation is an important issue for household finance, inequality, equity markets and investment.

[1] Gallup (2025) estimates 61% of US households own stocks directly or indirectly.

[2] In the UK, 10% of households hold stocks directly FCA(2023). Estimates show 11.8m individuals have £10k or more in savings in excess of emergency funds, yet hold more than 75% of this wealth in bank savings accounts

Introduction

Literature suggests many causes for low rates of stock market participation by households (for a review of the literature, see Menkoff & Westerman, 2025):

- Risk aversion (Cohn et al., 1975; Mankiw & Zeldes, 1991), participation costs (Vissing-Jorgensen, 1998), tail risks (Rietz, 1998), social networks (Hong et al., 2004), trust (Guiso et al., 2008), social insurance (Gormley et al., 2010), cognitive ability / IQ (Christelis et al., 2010; Grinblatt et al., 2011), political uncertainty (Agarwal et al., 2022), corruption (Bu et al., 2022)

Consumer understanding of the equity premium has been shown to be important for stock market participation (Van Rooij et al., 2011; Bucher-Koene et al., 2023; Munir et al., 2024)

- e.g. Van Rooij et al. (2011) find in survey data that on average individuals perceive stocks as higher risk, but not higher returns (compared with bonds). This misperception positively correlates with low stockholding in survey data.

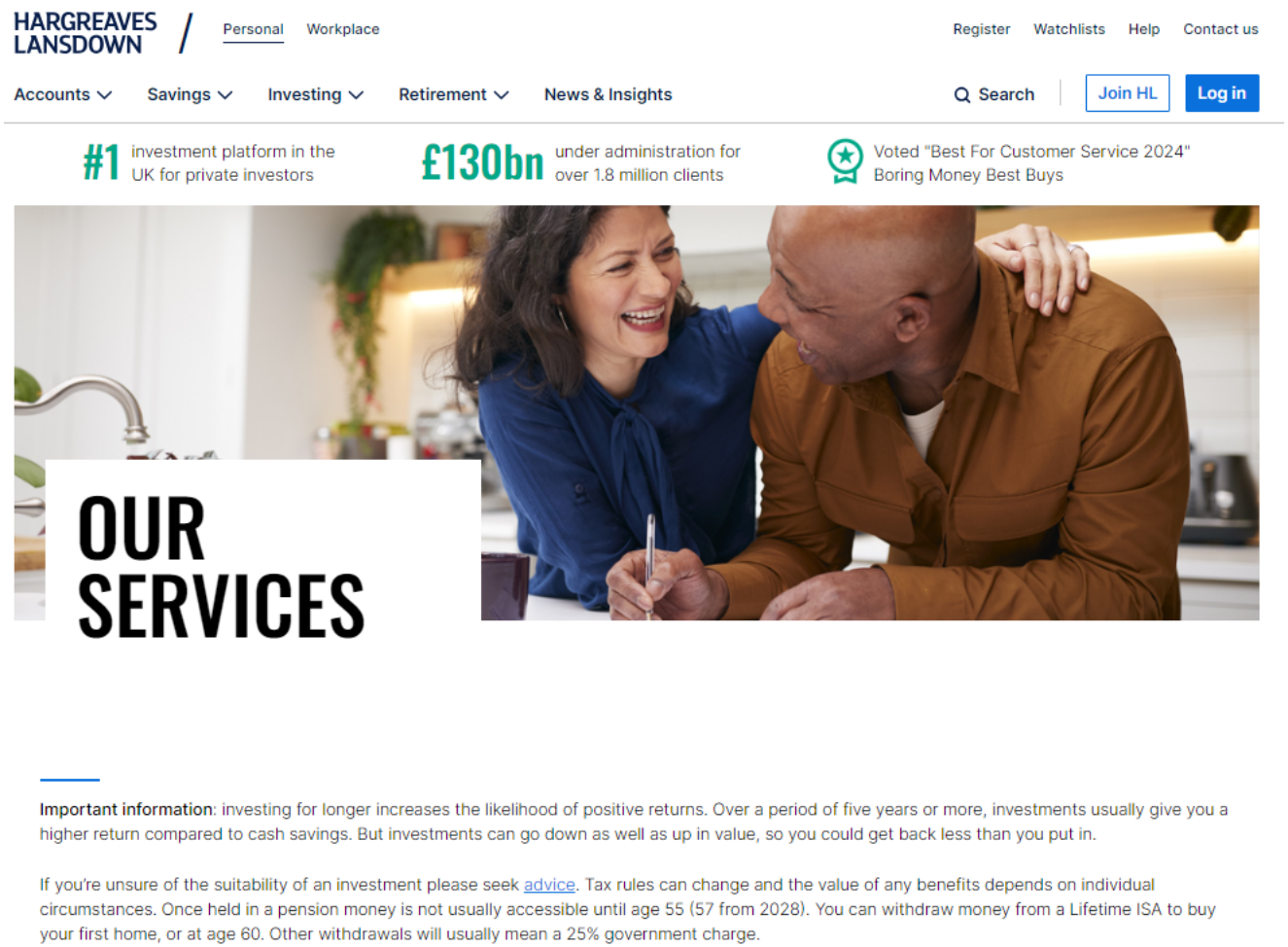
RCT Disclosures

Table: RCT Disclosure Messages

Label	Disclosure Message
Standard	**Important information:** investments can go down as well as up in value, so you could get back less than you put in.
Equity Premium	**Important information:** investing for longer increases the likelihood of positive returns. Over periods of five years or more, investments usually give you higher returns compared to cash savings. But investments can go down as well as up in value, so you could get back less than you put in.
Equity Premium Plus Data	**Important information:** investing for longer increases the likelihood of positive returns. Over periods of five years or more, investments usually give you higher returns compared to cash savings. In fact, there are over 100 years of data showing that for 91% of 10-year periods, investments in shares have done better than holding cash. But investments can go down as well as up in value, so you could get back less than you put in.

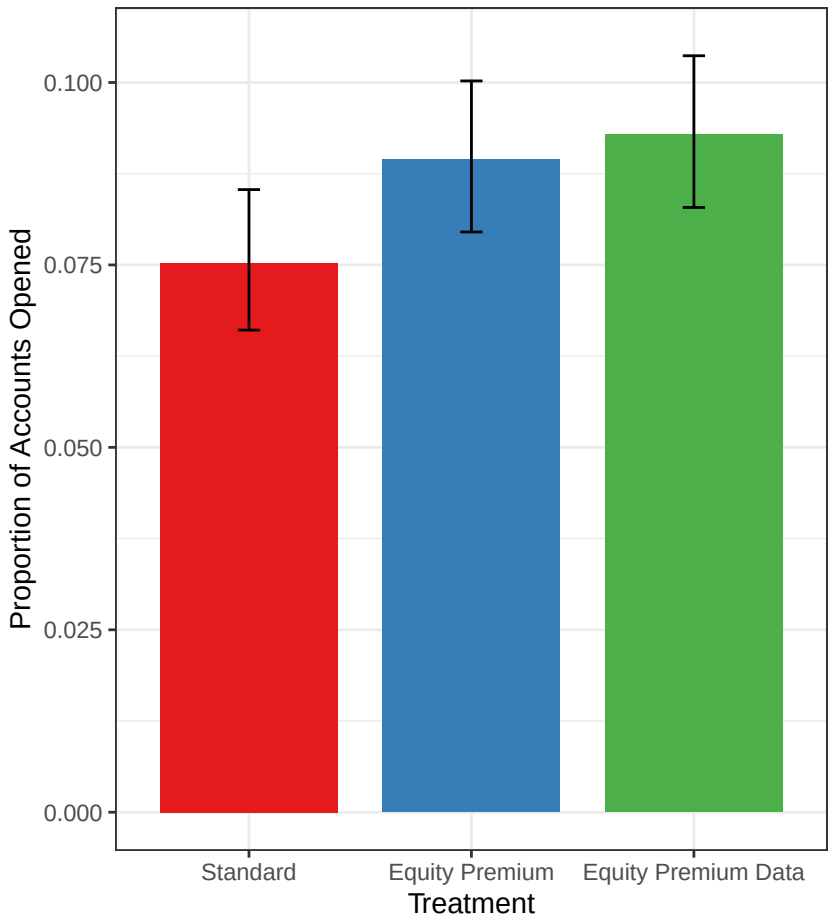
Disclosure Example

Figure: Example Webpage (Equity Premium Disclosure)



Results: New S&S ISA Openings

Figure: New Account Opening Rates for S&S ISAS



Results: Balances

Table: Treatment Effects on New S&S ISA Balances, 1-6 Months

	Month 1		Month 3		Month 6	
Treatments						
Equity Premium	2,813	3,732	4,711	5,640	4,494	5,448
	(4,749)	(4,721)	(5,330)	(5,294)	(5,273)	(5,226)
Equity Premium Data	8,178*	7,669*	9,328*	8,743*	10,970**	10,306**
	(4,685)	(4,652)	(5,258)	(5,218)	(5,201)	(5,150)
Demographics						
Male		-5,708		-6,374		-6,984
		(3,985)		(4,469)		(4,411)
Age (years)		300**		418***		482***
		(120)		(135)		(133)
Tenure (years)		477		522		453
		(490)		(550)		(543)
Time from First Exposure (Days)		507***		461**		428**
		(171)		(192)		(190)
Constant	7,184**	-18,375**	12,919***	-58,222**	13,509***	-95,290**
	(3,507)	(8,435)	(3,937)	(24,290)	(3,894)	(40,919)
Observations	782	782	782	782	782	782
R^2	0.0042	0.0283	0.0040	0.0297	0.0059	0.0356

Results: Asset Allocation

Table: Treatment Effect on Asset Allocation (Existing S&S ISA)

	Equities		Funds		Bonds		Cash	
Treatments								
Eq.Prem.	0.0112**	0.0097*	0.0004	0.0018	0.0004	0.0005	-0.0069***	-0.0068***
	(0.0044)	(0.0046)	(0.0060)	(0.0059)	(0.0011)	(0.0011)	(0.0015)	(0.0014)
Eq.Prem.Data	0.0192***	0.0188**	-0.0050	-0.0048	-0.0002	-0.0002	-0.0021	-0.0019
	(0.0064)	(0.0054)	(0.0039)	(0.0038)	(0.0013)	(0.0013)	(0.0044)	(0.0044)
Constant	0.2926***		0.4670***		0.0062***		0.1233***	
	(0.0026)		(0.0063)		(0.0008)		(0.0037)	
Controls	NO	YES	NO	YES	NO	YES	NO	YES
Date FE	NO	YES	NO	YES	NO	YES	NO	YES
Observations	20,512	20,512	20,512	20,512	20,512	20,512	20,512	20,512
R^2	0.0004	0.0304	0.0000	0.0121	0.0000	0.0005	0.0001	0.0194

Conclusion

Results in brief: New variant risk warnings ...

- Increase new S&S ISA openings (among existing customers)
- Increase investment amounts in S&S ISA openings
- Reallocate existing S&S ISA holdings towards equities
- These effects persist 6 months post-trial

We plan to investigate in an online RCT in a online survey-based simulated journey

- The mechanisms behind the observed effects
- The factors (moderators) affecting treatment magnitudes

Conclusion

So, we found:

- Gambling displaces savings and investments
- Auto enrolment into workplace pensions increased unsecured debt
- Adding information to risk warnings greatly increases investment

Reflections:

- Measure what you actually care about
- Partnering with these organisations is hard, but worth it
- These effects are surprisingly large
- I would struggle to predict this stuff

References

Beshears, J., Blakstad, M., Choi, J., Firth, C., Gathergood, J., Laibson, D., ... Stewart, N. (2026). *Does pension automatic enrolment increase debt? Evidence from a large-scale natural experiment.* Retrieved from `https://www.nber.org/papers/w32100` doi: 10.3386/w32100

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