Undersum Bias as an Impediment to Precautionary Saving

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Pension Research Council 2024
Wharton Business School
Undersum Bias

• A ‘multiple discovery’ phenomenon?
  • Scheibehenne (2019) – grocery shopping
  • Goswami et al. (2022) – 10 experiments!

• Systematic underestimation of accumulation, even without compound interest.

• Implications for:
  • Saving (why bother?!)
  • Spending forecasts
  • Risk forecasts?
Diagnostic Analysis of Saving Behaviour

Review of previous trials
- Mental accounting
- Pre-commitments
- Inattention

Analysis of CCPC Microdata
- Future-thinking
- Impulsivity

Interventions
- Nudge & Boost
- Cognitive Bias
Two Interventions

Eligible Customers

Randomly split

Bias Comms

Bias Comms

Control Form

Nudge & Boost

Wellbeing Comms

Control Form

Nudge & Boost

Wellbeing Comms

Wellbeing Comms

Randomly split

Randomly split
1. “Nudge & Boost” Application Form

You’re planning to start saving on 27th January 2022 and you want to save €6,000.00. Our interactive calculator can help you figure out how much you need to save each month and how quickly you want to reach your savings target.

**Would you like to use our interactive calculator?**
- [ ] Yes
- [ ] No

**Do you have a date in mind for when you would like to reach your savings target?**
- [ ] Yes
- [ ] No

**When do you want to start saving?**
30/11/2022

**Interactive Savings Calculator**

Do you have a date in mind for when you would like to reach your savings target?
- [ ] Yes
- [ ] No

**How much do you want to save each month?**

If you save €250 each month you will reach your savings target by 27/1/2024

**“Undersum” Bias**
2. “Cumulative Risk” Communication

- Focus on one bad outcome
- Underweight probability it occurs
2. “Cumulative Risk” Communication

- Focus on one bad outcome
- Underweight probability it occurs
- Ignore cumulative risk
2. “Cumulative Risk” Communication
2. “Cumulative Risk” Communication

6 out of 10 people face unexpected expenses each year
2. “Cumulative Risk” Communication

6 out of 10 people face unexpected expenses each year.

We know saving isn’t easy. And saving for the unexpected is harder still…

But it is easy for expenses to stack up!
Household repairs, medical bills, laptops crashing, car breakdowns…
2. “Cumulative Risk” Communication

6 out of 10 people face unexpected expenses each year.

We know saving isn’t easy. And saving for the unexpected is harder still...

But it is easy for expenses to stack up! Household repairs, medical bills, laptops crashing...

All of these add up, meaning most people face at least one unexpected expense each year.

And 3 in 10 face more than one.

Don’t get caught out by the unexpected. Putting aside a small amount each month can help make sure you’re able to handle any unplanned costs that crop up.

Get flexibility in how much you save, when you start and when you can withdraw.

Start Saving
RCT Design

2x2 RCT:

- No financial difficulties (arrears)
- No GoalSaver account
- Marketing consent

161,300 customers

Randomisation

No Contact Control
n = 22,732

Wellbeing Comm + Control Form
n = 34,660

Wellbeing Comm + Nudge & Boost
n = 34,634

Risk Comm + Control Form
n = 34,643

Risk Comm + Nudge & Boost
n = 34,631

Timing: May-Nov 2021
Period of very low saving uptake

Organic A/B Test:

- Organic GoalSaver Openings
- Control Form
- Nudge & Boost
Results
2x2 RCT: Accounts Opened

“business as usual”

25%

Both interventions increased saving rates

Penalised Likelihood Models of Account Uptake

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Ref: Wellbeing + Control App.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Contact</td>
<td>0.00</td>
<td>0.22</td>
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<tr>
<td></td>
<td>(0.16)</td>
<td>(0.21)</td>
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<tr>
<td>Wellbeing + Nudge &amp; Boost</td>
<td>0.25**</td>
<td>0.48***</td>
</tr>
<tr>
<td></td>
<td>(0.15)</td>
<td>(0.18)</td>
</tr>
<tr>
<td>Risk Comm + Control App.</td>
<td>0.20*</td>
<td>0.43***</td>
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<tr>
<td></td>
<td>(0.15)</td>
<td>(0.18)</td>
</tr>
<tr>
<td>Risk Comm + Nudge &amp; Boost</td>
<td>0.25**</td>
<td>0.54***</td>
</tr>
<tr>
<td></td>
<td>(0.15)</td>
<td>(0.18)</td>
</tr>
<tr>
<td>Socio-Demographic Controls</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

N: 161,300 (1) 71,671 (2)

*p < .1; **p < .05; ***p < .01
2x2 RCT: Accounts Opened & Amount Saved

**OLS Models Predicting Log$_{10}$(Initial Deposit)**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Contact</td>
<td>0.11</td>
<td>0.14</td>
</tr>
<tr>
<td>(Ref: Wellbeing + Control App.)</td>
<td>(0.21)</td>
<td>(0.27)</td>
</tr>
<tr>
<td>Wellbeing + Nudge &amp; Boost</td>
<td>-0.08</td>
<td>-0.29</td>
</tr>
<tr>
<td>(0.18)</td>
<td>(0.23)</td>
<td></td>
</tr>
<tr>
<td>Risk Comm + Control App.</td>
<td>0.13</td>
<td>-0.23</td>
</tr>
<tr>
<td>(0.18)</td>
<td>(0.23)</td>
<td></td>
</tr>
<tr>
<td>Risk Comm + Nudge &amp; Boost</td>
<td>0.06</td>
<td>-0.03</td>
</tr>
<tr>
<td>(0.18)</td>
<td>(0.24)</td>
<td></td>
</tr>
<tr>
<td>Socio-Demographic Controls</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>540</td>
<td>271</td>
</tr>
</tbody>
</table>
Conversion Rate

\[ Z = 2.89, \ p = .004 \]

Conversion Rate

\[
\begin{align*}
\text{% sessions started} & \quad \text{Organic} \\
\text{Control Form} & \quad 39.5\% \\
\text{Nudge & Boost} & \quad 5.1\% \\
\end{align*}
\]

\[ \text{Median deposit (scaled to 1SD)} \]

\[ \begin{array}{c|c|c|c}
\text{Income} & \text{No} & \text{Yes} \\
\hline
\text{N} & 993 & 748 \\
\end{array} \]

\[ OLS \ Models \ Predicting \ Log_{10}(\text{Initial Deposit}) \]

\[ \begin{array}{l|c|c}
\text{Nudge & Boost} & -0.24** \\
(\text{Ref: Control}) & (0.09) \\
\text{Income} & \text{No} \\
\text{Controls} & \\
\text{N} & 993 \\
\end{array} \]

*\( p < .1; **p < .05; ***p < .01 \)

\[ \rightarrow \text{Completion rate of savings applications far higher, but amount saved lower...} \]
Scaling Up Differences in Income

Number of accounts if all were...

- Control Form
- Nudge & Boost

→ Nudge & Boost shows stronger benefit for those on lower incomes, with potential to more than double saving account uptake
→ No detriment to those on higher incomes
Spillover Effects

*Concern:* Saving more might lead to borrowing to cover other expenses

<table>
<thead>
<tr>
<th></th>
<th>Main Trial</th>
<th>Organic Uptake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overdrafts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loans &amp; credit card balances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other savings accounts opened</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current account balance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Summary

- Combining Nudges & Boosts led to larger-than-expected increase in saving account uptake (over 25%)
- Nudge & Boost especially helpful for those on lower incomes
- Infographics explaining cumulative probability of financial shocks can motivate saving

esri.ie/bru  shane.timmons@esri.ie  psyarxiv.com/kqh4t
1. “Nudge & Boost” Application Form

What goal are you saving for? *

Unexpected need

‘Point of sale’ financial advice

Tip: Your Unexpected Need fund should help you get by for 3 to 6 months if your income were to drop. So, if your mortgage/rent, food, bills, etc. add up to €2,000 per month, you would ideally try to save €6,000 to €12,000.

How much would you like to save overall? *

€

When would you like to start saving? *

dd/mm/yyyy

Tip: Choosing a date soon after your regular payday can help make saving easier.
1. “Nudge & Boost” Application Form

Psychological Pre-Commitment

**Pledge tool**

You chose to save for an Unexpected Need. Research shows that you’ll be more likely to stick to your savings goal if you think now about the kinds of things that might count as an unexpected need. You can also think about what you might be tempted to spend your savings on that you might later regret. Our pledge tool is available to assist customers in thinking about these reasons ahead of time.

Would you like to use our Pledge tool to help you stick to your savings goal and have instant access to your funds when you need it. *

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
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Your unexpected need fund should try to cover unexpected or emergency costs so that you don’t need to borrow money for something that is essential.

**Which of the following are reasons you might need to withdraw from your Unexpected Need fund? Select all that apply. * **

- Something in the house (e.g. fixing the boiler, replacing a broken appliance or essential repairs)
- Something to do with the car (e.g. unexpected repairs)
- Something to do with the family (e.g. a new baby, vets bills, helping a family member)
- Something health related (e.g. unexpected doctors visit)
- A sudden loss of income (e.g. extended unemployment)

**Which of the following are things you might be tempted to withdraw from your Unexpected Need fund for, but that you might later regret? Select all that apply. **

- Non-essential shopping (e.g. unnecessary technology upgrade)
- Socialising (e.g. unnecessary restaurant trip, a night out)
- Concert or event tickets
- Gym or club membership
- Travel Expenses (e.g. holiday flights, a hotel)
Application Features*

Significantly higher use of behavioural features among completes compared to non-completes and compared to all applications ($p < .001$)

*NB. Data are based on Google Analytics and are incomplete
EDM Engagement*

Click-Thru Rates

- Standard
- Behavioural

→ Significantly higher CTR ($p < .001$)

Quiz Results

- Result
- Started Application

*NB. Data are based on Google Analytics and are incomplete