The Role of Stock-Flow Reasoning in Understanding the Social Security Trust Fund

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Social Security Trust Fund

Social Security benefits are paid from the OASI and DI trust funds
- Funded through payroll taxes and interest
- Balance is accumulation of all prior annual surpluses and deficits

Annual Trustees Report provides historical values and long-run projections for the combined OASDI trust fund
- Projected depletion date (2035) is widely reported

What do people think is the effect of trust fund depletion on benefits?
- We focus on public perception (not policy impact nor projections themselves)
Combined OASDI trust fund ratio roughly tracks OASI trust fund ratio
Public Perception is Pessimistic

Under current policy, if trust fund runs out, trustees project able to pay ~80% of scheduled benefits.

Yet many Americans believe they will get no benefits, indicating the public may be miscalibrated.

About four-in-ten Americans say, by the time they retire, Social Security won’t have enough money to provide benefits.

Among those who are not retired, % saying that, when they are ready to retire, Social Security will provide benefits at...

<table>
<thead>
<tr>
<th>Current levels</th>
<th>Reduced levels</th>
<th>No benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>All adults</td>
<td>16</td>
<td>42</td>
</tr>
<tr>
<td>Ages 18-29</td>
<td>15</td>
<td>42</td>
</tr>
<tr>
<td>30-49</td>
<td>11</td>
<td>37</td>
</tr>
<tr>
<td>50+</td>
<td>23</td>
<td>48</td>
</tr>
</tbody>
</table>


Parker, Morin, & Horowitz, 2019; cf. Luttmer & Samwick, 2018
People may interpret “fund runs out” to mean “benefits stop” Consistent with a general finding of stock-flow reasoning errors

Jerit & Barabas 1996; Quinby & Wettstein 2021
People Have Difficulty Understanding Accumulation

If you integrate the net flow from the top chart, you get the bottom chart.

But calculus is hard.

Stock-Flow Format Affects Judgments

Both charts show the same jobs data (shaded region is 2009)

Given the **flow** chart, people say economy *improved* in 2009
Given the **stock** chart, people say economy *worsened* in 2009

Spiller, Reinholtz, & Maglio 2020
Such Reasoning Errors Are Widespread

Stock-flow reasoning errors apply broadly across different domains

• Economic growth
  • Spiller et al., 2020
• New vs. cumulative COVID cases
  • Reinholtz et al., 2021; Villanova 2022; Harman et al., 2021; Padilla et al., 2022
• Atmospheric CO$_2$
  • Sterman & Booth Sweeney, 2007; Sterman 2008
• Personal and corporate cash flows
  • Booth Sweeney & Sterman 2000; Newell et al. 2016; Spiller et al., 2020

These reasoning errors likely apply to OASDI trust fund as well
Experiments

We tested the impact of stock vs. flow presentation on expectations about future benefits in two experiments

- Participants were recruited via an online crowdsourcing marketplace (Amazon’s Mechanical Turk)

All participants saw the same information about the trust funds

We varied whether charts displayed:

a) past and projected balance of the trust fund (stock) or
b) past and projected inflows and outflows of the trust fund (flow)
Experiment 1

$N = 1,001$ were randomly assigned to see stock or flow graph

- Participants were also given brief descriptions of OASDI trust fund and how to read the graph
Key Questions for Participants

1. When did / will the trust funds' total costs exceed total income?
2. When did / will the trust funds run out of money?
3. What is most likely to happen to benefits if the trust funds are depleted? [assuming no action taken on taxes]
   a) Social Security will no longer be able to pay out benefits
   b) Social Security benefits will still get paid out and will be a smaller amount
   c) Social Security benefits will still get paid out and will be the same amount
   d) Social Security benefits will still get paid out and will be a larger amount

We combine these three responses as “benefits paid”
## Experiment 1: Flow increased percentage who believe benefits will be paid

<table>
<thead>
<tr>
<th></th>
<th>Stock</th>
<th>Flow</th>
<th>Statistical test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year costs exceed income</td>
<td>56% correct</td>
<td>56% correct</td>
<td>ns</td>
</tr>
<tr>
<td>Year trust fund runs out</td>
<td>80% correct</td>
<td>72% correct</td>
<td>p = .004</td>
</tr>
<tr>
<td>What happens to benefits?</td>
<td>36% benefits paid</td>
<td>44% benefits paid</td>
<td>p = .008</td>
</tr>
</tbody>
</table>
Experiment 2

$N = 1,503$ participants

Adjusted graphs to align more closely with Trustees Report
- Excluded interest income and changed y-axis metric

Tested an Enhanced Flow condition that emphasized shift in flow
Experiment 2: Flow increased percentage who believe benefits will be paid

<table>
<thead>
<tr>
<th></th>
<th>Stock</th>
<th>Flow</th>
<th>Enhanced Flow</th>
<th>Stock vs. Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year costs exceed income</td>
<td>47% correct</td>
<td>46% correct</td>
<td>43% correct</td>
<td>ns</td>
</tr>
<tr>
<td>Year trust fund runs out</td>
<td>74% correct</td>
<td>71% correct</td>
<td>73% correct</td>
<td>ns</td>
</tr>
<tr>
<td>What happens to benefits?</td>
<td>39% benefits paid</td>
<td>46% benefits paid</td>
<td>46% benefits paid</td>
<td>p = .027</td>
</tr>
</tbody>
</table>

Across both experiments, presenting flow (vs. stock) information increased inferences that some benefits will be paid post-depletion.
Takeaways

People systematically conflate trust fund balance with ability to pay benefits
  • Presenting flows increases belief that some benefits will be paid after depletion
  • Level of misunderstanding remains high (> 50%)

Future directions
  • Classify media headlines around each year’s Trustees Report
  • Consider alternative presentation techniques to further reduce misperception

This research reinforces importance of considering content salience (in addition to content) in trust fund communications
  • cf. Quinby & Wettstein (2021)
Thank you

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