The Psychology of Debt Management

Shahar Ayal (Interdisciplinary Center (IDC) Herzliya)

Based on projects with - Moty Amar (Ono Academic College), Dan Ariely (Duke University), Scott I. Rick (University of Michigan), Cynthia E. Cryder (Washington University at St. Louis) Dan Zakay (Interdisciplinary Center (IDC) Herzliya) Guy Hochman (Duke University
Introduction

• According to the Federal Reserve in 2008-2009 the credit card debt (in the USA) reached $975 billion (all-time high)
  – Credit users hold more than 5 cards on average

– How consumers manage multiple debts?

• A question of interest to consumer researchers, financial institutions and policy makers...

• This paper examines:
  ➢ What are the main strategies people use to manage their multiple debts?
  ➢ Whether their decisions are consistent with normative principles?
How consumers who carry multiple debts, decide which debt to repay first??

The rational perspective
Repay loan with highest interest rate most quickly, then loan with next highest interest rate, and so on
However, there is good reason to suspect that consumers might stray from normative principles....

- Consumers tend to greatly underestimate how interest compounds over time
  - e.g., Eisenstein & Hoch (2005); Stango & Zinman (2009)

- Attributes that are difficult to evaluate tend to receive less weight in decision-making (cf. Hsee 1996; Gigerenzer & Hoffrage 1995)

Introduction
Introduction - Integrate Losses

• People tend to concentrate in the loss domain....

Segregated losses more distressing than a comparable integrated loss (Thaler 1985; Thaler and Johnson 1990)

Diversity seeking was obtained under conditions of gain, whereas diversity aversion was obtained under conditions of Loss (e.g., Ayal and Zakay 2009 JPSP)
Mean diversification-tendency under conditions of gain and loss (Ayal, Zakay & Hochman, 2011)
Another factor which is likely contribute to the tendency to close small debts – goal and subgoals

- People tend to break difficult goal to subgoals which are more manageable (e.g., Amir and Ariely 2008; Fishbach and Dhar 2005; Newell and Simon 1972)

However focusing on subgoals can reduce the motivation (or ability) to achieve the high level goal

(e.g., Fishbach, Dhar, and Zhang 2006; Heath, Larrick, and Wu 1999; Heilizer 1977; Kivetz, Urminsky, and Zheng, 2006; Nunes and Dreze 2006).
Debt Account Aversion Hypothesis

We propose that consumers will primarily be motivated to reduce the total number of debts, not the total debt, resulting in "Debt account aversion."
Dave Ramsey’s “Snowball Method”

Consumers need some quick wins in order to stay pumped enough to get out of debt completely.

Although the math seems to lean more toward paying the highest interest debts first.
To examine how consumers manage multiple debts overtime, we developed the debt management game.

The goal of the game - reduce the total debt.
The debt management game (starting point)

**YOU HAVE PLAYED 0 ROUNDS OUT OF 25**

Decide how much to allocate for each debt using the "Add/Change" button, and then click on the "Approve All" button to submit your decision.

Read Carefully: This game is composed of 25 rounds (representing 25 years). In each round you get a fixed salary, and from time to time you might also get a bonus. Your task on each round is to decide how to allocate your money between your six loans (repay debts). The yearly interest rate for each debt (R) is noted next to it. Note that in each round you are required to use all your available cash to repay debts.

On the left panel you can see your available cash, your six loans, and your total balance. As you play the game, the lines on the graph below will reflect your historical and current financial picture.

**Game Goal:** Finish with the highest possible Total Balance (highest positive or smallest negative number).

**Important:** After completing 25 rounds you might be asked to proceed to an additional task.

---

**FREE YEARLY INCOME:**
- Yearly income (in U.S.$) after living expenses:
  - Fixed Income: $5000
  - Bonus: $0

**CURRENT POSITION:**
- Rounds Played: 0
- Total Rounds: 25
- Cash Available: $147000.00
- Total Debt: $142000.00
- Total Balance: $0

**ALLOCATE CASH**
- CHOOSE DEBT:
  - TYPE AMOUNT: 0
  - Add/Change

**CURRENT DEBTS STATUS:**
- Debt1: $3000 $, R=2.50%
- Debt2: $8000 $, R=2.00%
- Debt3: $11000 $, R=3.50%
- Debt4: $13000 $, R=3.25%
- Debt5: $52000 $, R=3.75%
- Debt6: $60000 $, R=4.00%

---

**Cash received in each round**

**Initial Amount**

**Rounds**

---

**The 6 debts**
Example: In Round 1, this player completely paid off Debt 1 ($3,000).

The remaining available cash ($2,000) was paid toward Debt 2, the next lowest debt.

All other debts increased in size from Round 1.
Final screen for a perfectly rational player
Final screen for a perfectly debt-account-averse player
Experiment 1

- Two conditions: Control vs. Savings-Allowed
  - Control: All annual income must be used to repay debts
  - Savings-Allowed: Can put any portion of income into a savings account that accumulates interest at 2% annual rate
- Interest rates of debts range from 2% to 4%
- 162 undergraduates (56% female) participated
Experiment 1 Results

• Average total debts in both conditions greater than $29,428 rational baseline (both ps < .001)
  
  – On average, Ps accumulated $41,479 in debt

• Total debt in Control condition: -$38,371
• Total debt in Saving-Allowed condition: - $44,513
  p < .001
Departures from Rationality

- Proportion of Ps who consistently repaid all available cash to the open account(s) with the highest interest rate(s): 0/162

- Proportion of Ps who repaid ≥ 90% of available cash to the open account(s) with the highest interest rate(s) in each of the final 10 rounds: 5/162
Non-optimal behavior over time:
The mean proportion of money allocated non-optimally by round.
Departures from Rationality Consistent with Debt Account Aversion

![Graph showing departures from rationality consistent with debt account aversion. The x-axis represents debts (and interest rates) ranging from $3,000 to $60,000 with interest rates at 2.5%, 2.0%, 3.5%, 3.25%, 3.75%, and 4.0%. The y-axis represents a range from 0 to 25. The graph includes two lines labeled 'Round Debt Closed' and 'Saving-Allowed Control'.]
Can we direct people toward more optimal behavior?

• Eliminating ability to achieve subgoals may refocus Ps on superordinate goal of reducing total debt

• Experiments 2-3 manipulate whether Ps have ability to close small accounts
  – Exp 2: Debts can be reduced to small amount, but not closed
  – Exp 3: Small accounts consolidated into one large account
Experiment 2: non-closeable accounts

**Read Carefully:** This game is composed of 25 rounds (representing 25 years). In each round you get a fixed salary, and from time to time you might also get a bonus. Your task on each round is to decide how to allocate your money between your six loans (repay debts). The yearly interest rate for each debt (R) is noted next to it. Note that in each round you are required to **use all your available cash to repay debts.**

**Game Restriction:** You are not allowed to repay the last 2000$ of any debt!

On the left panel you can see your available cash, your six loans, and your total balance. As you play the game, the lines on the graph below will reflect your historical and current financial picture.

**Game Goal:** Finish with the highest possible Total Balance (highest positive or smallest negative number).

**Important:** After completing 25 rounds you'll be asked to answer a mandatory questionnaire.

---

**FREE YEARLY INCOME:**
Yearly income (in U.S.$) after living expenses

<table>
<thead>
<tr>
<th>Fixed Income:</th>
<th>5000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonus:</td>
<td>0</td>
</tr>
</tbody>
</table>

**CURRENT POSITION:**

<table>
<thead>
<tr>
<th>Rounds Played:</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Rounds:</td>
<td>25</td>
</tr>
<tr>
<td>Cash Available:</td>
<td>5000</td>
</tr>
<tr>
<td>Total Debt:</td>
<td>-128482.00</td>
</tr>
<tr>
<td>Total Balance:</td>
<td>-123482.00</td>
</tr>
</tbody>
</table>

**ALLOCATE CASH**

**CHOOSE DEBT:**
Debt5

**TYPE AMOUNT:**

| 5000 | Add/Change |

**YOUR PAYMENT CHOICES:**
Payback Debt5 Amount: 5000
Cash Left: 0.00

**CURRENT DEBTS STATUS:**

- Debt1: 2317$ R=2.50%
- Debt2: 2360$ R=2.00%
- Debt3: 2154$ R=3.50%
- Debt4: 2908$ R=3.25%
- Debt5: 53227$ R=3.75%
- Debt6: 65516$ R=4.00%

R = Yearly Interest on debt
Experiment 2 Results

• Total debt in Control condition: -$39,570
• Total debt in Non-Closeable condition: -$36,609

p < .025

• Both debts significantly exceed rational benchmark (p < .001)
Experiment 3: (Costly) Debt Consolidation

• A practical intervention
• Two conditions: Control vs. Debt Consolidation
  – Debt Consolidation: Debts 1-4 consolidated into one loan ($35K at a 3% interest rate)
    • This interest rate is slightly larger than the weighted average of the interest rates of the smaller loans
      \[
      (\sum_{i=1}^{4} \frac{Debt_i}{\sum_{i=1}^{4} Debt_i}) \times \text{Interest Rate}_i = 2.98\%
      \]
    – Debts 5 and 6 remain the same as in the Control condition
Experiment 3 (Costly) Debt Consolidation

• Intervention slightly hurts rational players
  – Rational player will conclude better in the control condition than in the non-closable condition.

• 102 undergraduates (60% female) participated
Experiment 3: Results

• Total debt in Control condition: - $38,649
• Total debt in Debt Consolidation condition: -$37,063

p < .05

• Both debts greater than rational baseline (p < .001)
<table>
<thead>
<tr>
<th>Ps who closed Debts 1-4 or the Consolidated Loan</th>
<th>When they closed (if they did)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control</strong></td>
<td>Round 10</td>
</tr>
<tr>
<td><strong>Debt Consolidation</strong></td>
<td>Round 16</td>
</tr>
<tr>
<td></td>
<td><strong>p = .08</strong></td>
</tr>
<tr>
<td></td>
<td><strong>p &lt; .001</strong></td>
</tr>
</tbody>
</table>
Experiment 4 – Reversed Biases

Irrational Diversification

Preferring (pseudo)diversity even when it reduces expected value

Debt account aversion

Prioritizing payments to low-balance debts over high-interest debts to reduce the total number of debts

Irrational aggregation of pools

Irrational segregation of pools

<table>
<thead>
<tr>
<th>Debt</th>
<th>Amount</th>
<th>Interest rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$2830</td>
<td>2.5%</td>
</tr>
<tr>
<td>B</td>
<td>$3476</td>
<td>2%</td>
</tr>
<tr>
<td>C</td>
<td>$5080</td>
<td>3.5%</td>
</tr>
<tr>
<td>D</td>
<td>$7200</td>
<td>3.25%</td>
</tr>
</tbody>
</table>

Which lottery will you prefer to play (to guess 5 numbers):

Choose five lottery ticket and mark five numbers

Which debt to close first:

Choose five lottery ticket and mark six numbers

Which debt to close first:

Choose five lottery ticket and mark six numbers
Reversed Biases (Ayal, Hochman & Zakay, 2011 JDM)
General discussion

In this research we provide consistent evidence of debt account aversion.

In three experiments, consumers tend to reduce the number of debt instead of the total amount of debt.

We also found that eliminating participants’ ability to completely pay off small debts improves their overall financial situation.

Minimal balance (Experiment 2)
Debts were consolidated (Experiment 3).

Correlation between over-diversification in gains and under-diversification in losses (Experiment 4)

Our results suggest that limitations as well as debt consolidation may be more helpful than previously thought.
Because they need “some quick wins in order to stay pumped enough to get out of debt completely” (Ramsey, 2009)

Debt account aversion suggests that many consumers share Ramsey’s intuition (can be helpful when positive correlation .....)

However, at least under our conditions-- consumers who close small accounts early in our experiments end up with more total debt ....they won the battle but lost the war...
SMART
Shel Silverstein

My dad gave me one dollar bill
‘cause I’m his smartest son,
And I swapped it for two shiny quarters
‘cause two is more than one!

And then I took the quarters
And traded them to Lou
For three dimes – I guess he don’t know
That three is more than two!

Just then, along came old blind Bates
And just ‘cause he can’t see
He gave me four nickels for my three dimes
And four is more than three!

And I took the nickels to Hiram Coombs
Down at the seed-feed store,
And the fool gave me five pennies for them
And five is more than four!

And then I went and showed my dad,
And he got red in the cheeks
And closed his eyes and shook his head
Too proud of me to speak!
Thanks!