Comments by Rafael Repullo on

The Conundrum of Zero APR
An Analytical Framework

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Introduction (i)

- Paper addresses very interesting topic

  → Promotional pricing of credit card debt in US

  → Zero initial APR (Annual Percentage Rate)

- Structure or paper

  → Review of the stylized facts

  → Theoretical models that can account for the facts

Introduction (ii)

- This discussion

  → Brief summary of facts

  → Brief review of main model

  → Simpler model that can account for some of the facts

Part 1

Stylized facts

Data

- Amazing dataset
  - → Panel of all credit card accounts reported by BHCs
  - → Monthly data for 2018 and 2019
  - → Including credit scores and zip code
  - → Promotional accounts identified by lenders

Stylized facts

1. A quarter of credit card debt has introductory promotional status, in most cases with zero APR
2. Expiration of a promotion involves a sizable rate hike
3. There is no systematic change in default risk between the origination and the expiration of a promotion
4. Promotions are associated with large movement of debt across credit cards

Part 2

Model setup

Model setup (i)

- Three dates ($t = 1, 2, 3$)
- Large number of risk-neutral competitive lenders

  → Cost of funds normalized to zero
- Large number of consumer families

  → Each family has continuum of members

  → Family members face perfectly correlated income risk

  → Concave utility function $u(c_t)$ and discount factor β

Model setup (ii)

- Income risk

  → With probability p negative income shock at $t = 2$ or $t = 3$

  → Default in low income state

- Credit line contract

  → Introductory interest rate and credit limit

  → Reset interest rate and credit limit

  → Reset terms can be sweetened ex post (irrelevant)

  → Refinancing offer by other lenders with probability ρ

Main result

- Equilibrium contract characterized by
  - → Not binding credit limits
  - → No refinancing
  - → No promotions

Extensions

- Hidden savings

  → Similar results as in original model

- Strategic default

  → No income risk and non-pecuniary cost of default

  → Main result: Binding credit limits

- Hyperbolic discounting

  → Consumers can or cannot be aware of time inconsistency

  → Main result: Promotional pricing may arise in equilibrium

Some comments

- Results of theoretical model are somewhat disappointing

  → Cannot account for stylized facts

- Model with hyperbolic discounting seems promising

  → Should it be the focus of the paper?

- Unclear why bother with consumer families

  → If members face perfectly correlated income shocks

Part 3

A simpler model

Model setup (i)

- Three dates ($t = 1, 2, 3$)
- Consumers characterized by

  → Utility function

$$u(c_1) + E[u(c_3)]$$

  → Risky endowment at $t = 3$

$$y_3 = \begin{cases} y, & \text{with probability } 1-p \\ y-\Delta, & \text{with probability } p \end{cases}$$

  → Information about income shock is not available at $t = 2$

  → No change in default risk between $t = 1$ and $t = 2$

Model setup (ii)

- Initial lender offers contract characterized by

  → Loan amount c_1

  → Gross interest rate R_2 if contract is liquidated at $t = 2$

  → Gross interest rate R_3 if contract is liquidated at $t = 3$

- At $t = 2$ a refinancing offer may arrive with probability ρ

  → Loan amount $c_1 R_2$

  → Gross interest rate $\hat{R}_3$

Model setup (iii)

- Participation constraint of initial lender

$$\rho R_2 + (1-\rho)(1-p)R_3 = 1$$

- Participation constraint of new lender

$$(1-p)\hat{R}_3 = R_2$$

→ Substituting the second constraint into the first gives

$$(1-p)\left[\rho\hat{R}_3 + (1-\rho)R_3\right] = 1$$

Optimal contract (i)

- Competitive lenders' maximization problem

$$\max_{c_1, R_3, \hat{R}_3} \left[u(c_1) + (1-p)\left(\rho u(y - c_1 \hat{R}_3) + (1-\rho) u(y - c_1 R_3) \right) + p u(y - \Delta) \right]$$

subject to

$$(1-p)\left[\rho \hat{R}_3 + (1-\rho) R_3 \right] = 1$$

Optimal contract (ii)

- First-order conditions

  → with respect to c_1

$$u'(c_1) = (1-p)\left(\rho \hat{R}_3 u'(\hat{c}_3) + (1-\rho) R_3 u'(c_3)\right)$$

  → with respect to R_3

$$u'(c_3) c_1 = \lambda$$

  → with respect to $\hat{R}_3$

$$u'(\hat{c}_3) c_1 = \lambda$$

  → where λ is the Lagrange multiplier of the constraint

Optimal contract (iii)

- Putting together the last two first-order conditions gives

$$u'(c_3)c_1 = u'(\hat{c}_3)c_1 = \lambda$$

→ which implies

$$c_3 = y - c_1 R_3 = y - c_1 \hat{R}_3 = \hat{c}_3$$

→ which implies

$$R_3 = \hat{R}_3$$

Optimal contract (iv)

- From here it follows that

$$R_2 = (1-p)\hat{R}_3 = (1-p)\left[\rho\hat{R}_3 + (1-\rho)R_3\right] = 1$$

→ Initial lender sets a zero APR for one period!

What's the intuition?

- Recall household's objective function

$$u(c_1)+(1-p)\Big(\rho u(\underbrace{y-c_1\hat{R}_3}_{})+(1-\rho)u(\underbrace{y-c_1R_3}_{})\Big)+pu(y-\Delta)$$

→ Setting $R_2 = 1$ ensures that $R_3 = \hat{R}_3$

→ Consumption is equalized across high income states

→ Utility maximizing for risk-averse households

Summing up

- Simpler model is consistent with

  → Introductory zero APR

  → Sizable rate hike when promotion expires

- Simpler model assumes

  → No change in default risk between $t = 1$ and $t = 2$

- Simpler model cannot explain

  → Movement of debt across lenders

  → Consumer is indifferent between original and new lender

Concluding remarks

Concluding remarks

- Paper presents very interesting and novel set of stylized facts

  → Evidence in search of a theoretical model

- Models in the paper are somewhat disappointing

  → Too complicated

  → Cannot account for stylized facts

- Model with hyperbolic discounting seems promising

  → Could be simplified to yield results consistent with facts?