

# Rational Inattention in Consumption Loan: Evidence from *Ant Credit Pay*

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# Deviation from Rationality

**Keynes's seminal idea:** Rational agents, continuously optimizing markets.

**Lucas(1973):** Signal-extraction problem in distinguishing information.

**Deviations from the assumption of rational agents:** To introduce limited information-processing capacity.

**Behavioral Economics:** ([Laibson, 1997](#), QJE)

**Learning:** [Sargent \(1993\)](#)

**Robust Control:** ([Hansen and Sargent, 2001](#), AER)

**Rational Inattention:** General theory of modeling limited capacity —— ([Sims, 2003](#), JME,AER(2006))

# What is Rational Inattention?

**Definition from Wiki:** "Effects of the cost of information acquisition on decision making".

**Mathematical Expression:** Optimization of attention allocation under limited capacity.

**Measurement of information acquisition:** Shannon Mutual Information Entropy

$$\min_q \{E[(Y - X)^2]\} = \int (y - x)^2 q(y|x) p(x) dy dx \quad (1)$$

**Information-Processing Constraint:**

$$s.t. (\forall x) \int q(y|x) dx = 1 \quad (2)$$

$$-E[E[\log_2(q(Y|X))|X]] + E[\log_2(\int q(Y|x)p(x)dx)] < C \quad (3)$$

# Application of Rational Inattention

**Macro Theory: Revision of RBC in DSGE Model** ([Ma kowiak and Wiederholt, 2015](#), RES):

A DSGE model with rational inattention and compare its predictions to data. Households and firms optimally allocate limited attention. The model matches the empirical impulse responses to real-life shocks. At the same time, profit and utility losses from inattention are very small.

**Micro Theory: Discrete Choice** ([Matjka and McKay, 2015](#), AER):

Model discrete choices with limited information using the RI approach to frictions. Find that the optimal strategy stays in line with a generalized multinomial logit model, which depends both on the actions' payoffs as well as on prior beliefs.

**Consumption Volatility** ([Luo, 2008](#), RED):

An analytical approach to solve PIM with RI and examine implications for optimal consumption, saving, and welfare. An endogenous propagation mechanism that disentangles the short-run and long-run responses of consumption to exogenous income shocks is presented.

**Asset Pricing** ([Kacperczyk et al., 2016](#), ECMA):

This paper tackles multi-asset modeling problems that uses the state of the business cycle to predict information choices. The predictions about fund portfolios' covariance with payoff shocks, cross-fund portfolio and return dispersion, and their excess returns are all supported by the data.

# Opaque Consuming Loan Rate



配送区域 (配送地可能会影响库存, 请正确选择)

颜色分类

购买数量 - 1 +

花呗分期

分3期(含手续费)  
¥ 613.46/期

分6期(含手续费)  
¥ 313.33/期

分12期(含手续费)  
¥ 161.16/期

确定

交易分期

5月累计可还(元)  
**1639.45**  
还款日5月10日

分期金额

¥ 1639.45 修改

期数 分12期

金额 每期148.64元  
总费率8.80%, 年化15.86%

确认分期

交易分期

5月累计可还(元)  
**1639.45**  
还款日5月10日

分期金额

¥ 1639.45 修改

期数 分6期

金额 每期285.54元  
总费率4.50%, 年化15.27%

确认分期

交易分期

5月累计可还(元)  
**1639.45**  
还款日5月10日

分期金额

¥ 1639.45 修改

期数 分3期

金额 每期560.14元  
总费率2.50%, 年化14.94%

确认分期

# RI in Policy Implementation

## Potential Problem

**Insufficient Information Generation:** Policy itself isn't as accessible as the loan and information disclosure is concealed.

**Rational Inattention:** The policy is for the public, while is hard to understand without sufficient financial knowledge. Some may know it, while the cost of making profit by the information is high. Attention deviates from it for rational agents.

## Our Experiment and Intervention:

Provide "understandable" information for the public, to verify if RI exists in individual cognition.

## Why is this Important?

1. Empirically check the phenomenon of rational inattention in individual micro financial markets, which is rarely covered in the literature.
2. Study the operational efficiency of policies and propose operational tools for more effective policy implementation.
3. Research into the new, easily accessible form of consumer loan, with recommendations for further financial regulation.

# RI in Policy Implementation

## Related Research Design

### Direct Methods: Special Surveys & Databases

[Leard \(2018\)](#): used data from a survey eliciting willingness to pay for vehicle attributes.

[Gaglianone et al. \(2020\)](#): exploit a dataset of professional forecasters who update inflation forecasts at days of choice.

### Indirect Methods: Proxy variable

([Kacperczyk et al., 2016](#), ECMA): used the covariance between portfolio and idiosyncratic shocks to proxy the inattention of portfolio managers.

([Bertoli et al., 2020](#), JIE): used the fraction of certain migrants destination to proxy the cost of searching information.

### Speciality of this RCT

1. A micro-level topic without available database or admin data.
2. The quantity of information generalization and to what extent people understand the information are unobservable.

**Our Solution:** 2 Survey + 1 Treatment



# General Setting and Sample

**Subjects:** Vocation-School Students in Zhejiang Province

1. typical borrowers of consumption loans
2. of medium financial knowledge level (gauged)
3. pseudo-homogeneous community: balanced randomization

**Treat Form:** E-mail and Survey

1. Operational: Easy to conduct, low cost, accurately peg to individual
2. Standard Treatment: Unlike class-meeting or other form
3. Incentive: red-packet and conciseness of the questionnaires

**Collaboration and Preparation:** with some already-contacted vocation schools

1. Student background info: Name, Grade, Class
2. Two survey will be matched by 4 last numbers of students' ID and phone number
3. Collaboration allows grouping before issuing surveys

# General Setting and Timeline

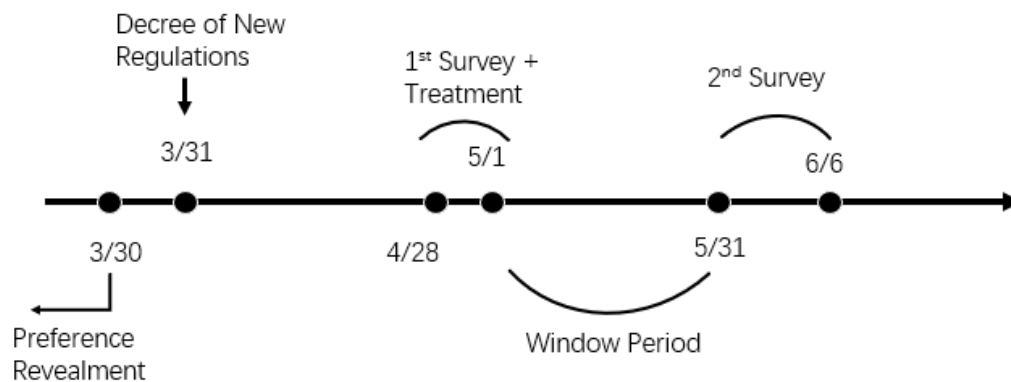


Figure: Schematic Timeline

# Research Design

## Filtering

1. Huabei non-activated
2. unmatched
3. not passing our checkpoint questions

## Main Variables

1. Explained Variable  $Y = \text{due repayment next month} - \text{due installment next month} + \text{unrecorded payable}$
2. Explanatory Variable  $X$ : dummies for groups
3. Control Variables: Income, Financing and Consuming habits (e.g. Taobao app-opening times)

## Grouping Details: Two Dimensions

1. Information Content
2. Information Source

## Treatment Details

此前，花呗分期还款会给出利率参考，如分 12 期（12 个月）还款利率约 6.5%。但这只是官方给定的名义利率，实际上并不是真实年化利率。实际上，由于花呗还款过程中一期一期支付本息，我们并没有在整个欠款期间完整占有欠本金的全部生命周期，还款过程中越到后期，真实利率越高。↵

央行出台新规后，花呗根据规定需要如实披露真实年化利率，分 12 期的真实年化利率为 15.86%。↵

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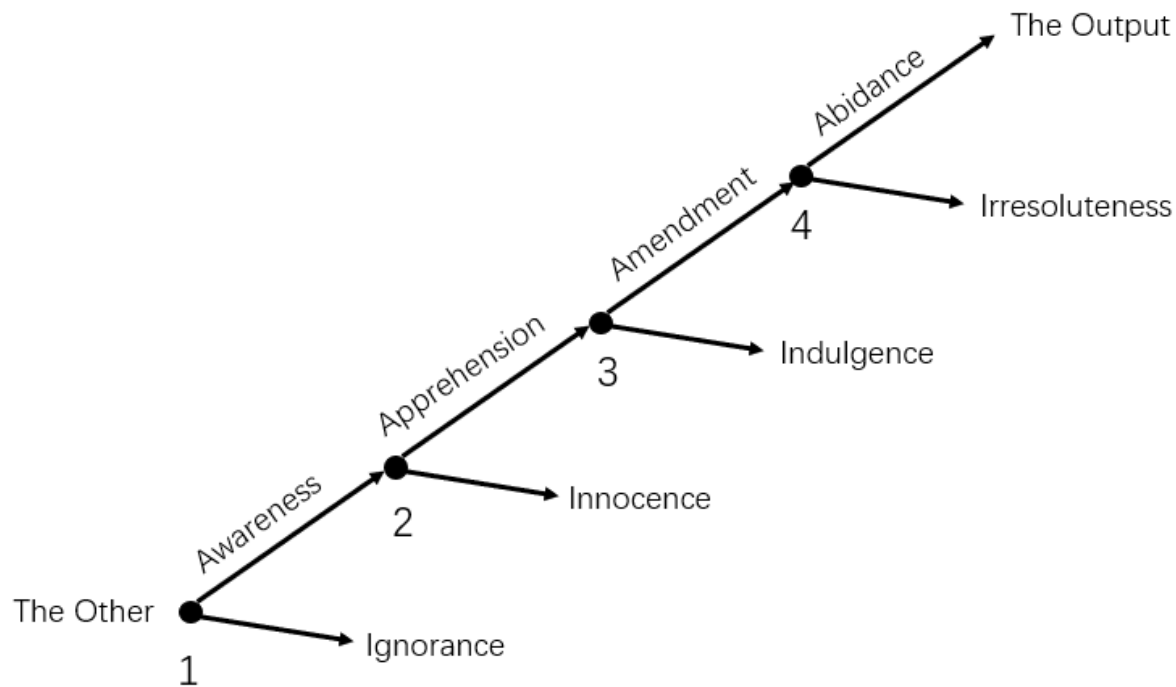
花呗分期产品类似于信用卡分期，经测算，信用卡分 12 期的真实年化利率也在 15% 左右。↵

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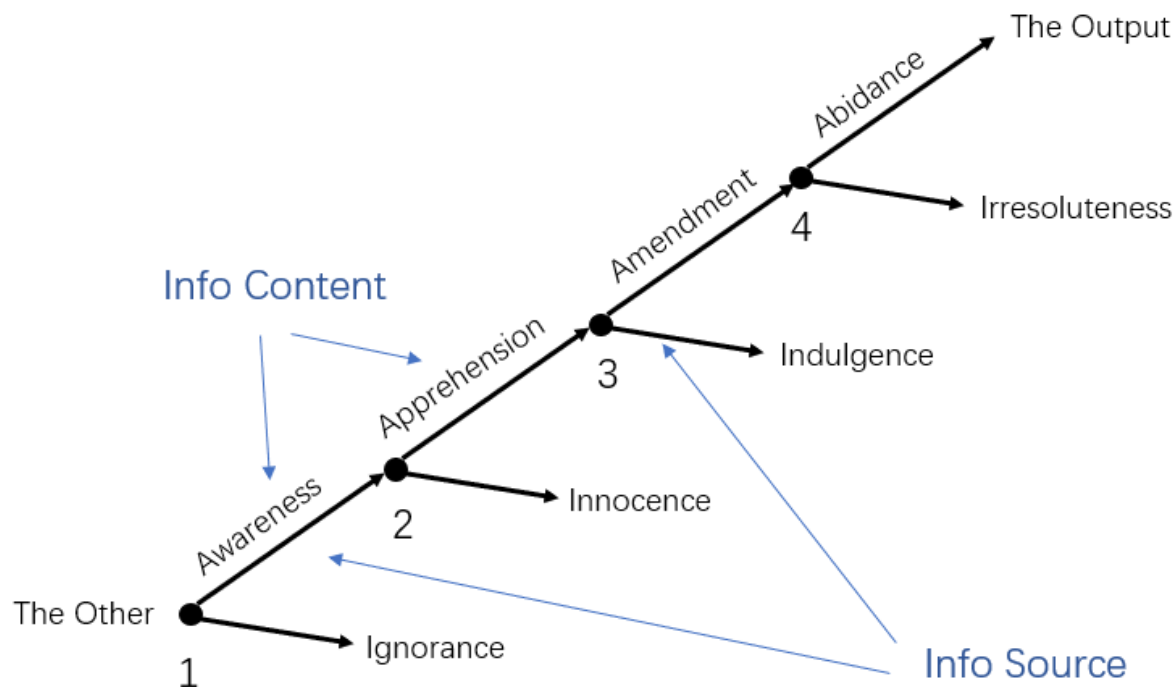
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一般来说，银行一年期定存利率约 1.75%，两年期定存约 2.25%，信托收益大约 8% 左右。↵

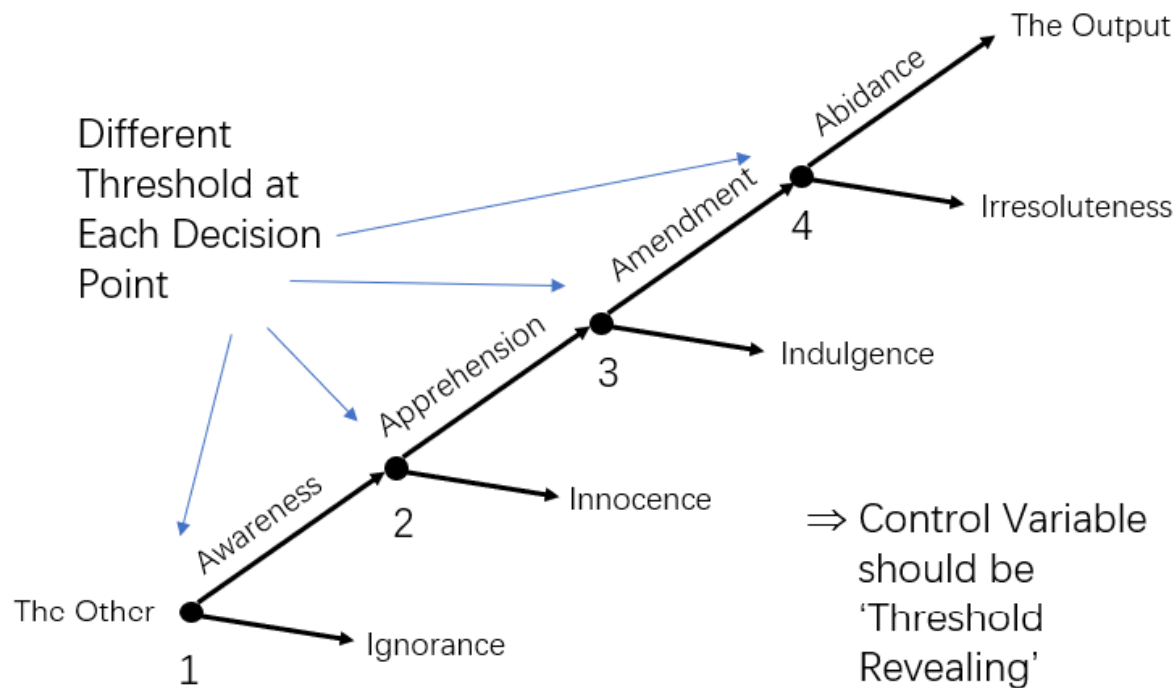
# An Attention-Decision Framework



# In Framework: 2-D Grouping



# In Framework: How to Select Controls



# Possible Concerns

## **Randomization Unit:** Individual or Class

1. Spillover: errors need to be clustered
2. Group Size:  $2 \times 4$  groups should contain variance.

## **Ratchet Effect:** it is hard to move from luxury to frugality

1. The outcome is insignificant: Mandatory prohibition may be necessary
2. Still significant: Our attention-arousing and comprehension-assisting tactics are even more effective.

## **Cost of implementation:** Budget Constraints

1. Red-packet Money



Thanks!

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