

Portfolio Rebalancing and Consumption Response of Households to Monetary Policy Shocks

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Motivation

- Magnitude of direct and indirect effects are important in studying impact of monetary policy on households in HANK models (Kaplan et al. (2018), Auclert et al. (2020), Kekre and Lenel (2020))
- Risk-taking channel among institutions has been well documented (Maddaloni and Peydro (2011), Di Maggio and Kacperczyk (2017), Lu et al. (2019))
- Recent studies show how changes in interest rate could impact households' demand for income generating assets (Daniel et al. (2021)), and how they affect changes in consumption along the liquid asset distribution (Holm et al. (2021)).

This paper

- Focus on savers and study household's heterogeneity in assets portfolios in India.
- Previous research focusses on household heterogeneity in House ownership (Disney et al. (2010)), Liquid wealth (Kaplan et al. (2014)) and Mortgage contract type (Di Maggio et al. (2017))
- Savers do form a sizeable component of the economy.
 - Bank Deposits to GDP ratio in U.S is approximately 80 percent in 2019

Empirical Challenges

1. Research Design

- Monetary policy is implemented nationwide and applies to all households
- Difficult to find a comparison group to identify the policy effect

2. Data Availability

- Households respond to changes in interest rate in different domains
- Need a large and representative sample with information on various consumer outcomes

Data

- Sample of 184,144 individuals from a leading bank in India
- Demographics: Occupation, State, Gender, Age, Martial Status, Income
- Individual-level monthly data from 2014 to 2017:
 1. Consumption
 - Credit card spending (with MCC Codes)
 - Debit card spending (with MCC Codes)
 - ATM withdrawals
 2. Investments in Risky Assets
 - Mutual Fund Investments
 - Equity Investments
 3. Bank Deposits
 - Savings/Checking Account
 - Term Deposits (Auto-renewal vs Non Auto-renewal)

Empirical Strategy

1. Identification:

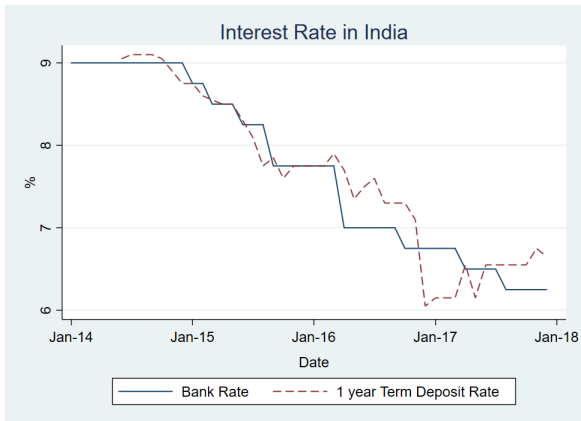
- Exploit variation around the **maturity of term deposits** after changes in interest rate (Similar to Di Maggio et al. (2017))

2. Why Term Deposits?

- Interest rate is constant throughout the tenure of the term deposits
- Pass-through only effective after the maturity of term deposits
- Change in interest rate for term depositors would be unexpected when they started their term deposits (independent of their characteristics)

Empirical Strategy

Focus on the time period March 2016 to October 2016



Methodology: Difference-in-Differences

Example:

1. May 2016

- **Treatment Groups:** Term Depositors that have expired in May 2016
- **Control Groups:** Term Depositors that have expired from June to October 2016 + Those with no expired term deposits

2. June 2016

- **Treatment Groups:** Term Depositors that have expired in May and June 2016
- **Control Groups:** Term Depositors that have expired from July to October 2016 + Those with no expired term deposits

Methodology

$$Y_{it} = \gamma_i + \lambda_t + \beta I_{it} + \epsilon_{it}$$

Y_{it} refer to Consumption Spending, Investments into risky assets, Change in Bank Deposits

I_{it} is a binary variable that is equal to 1 after the expiry of the term deposits (treatment group), and 0 before its expiry (control group)

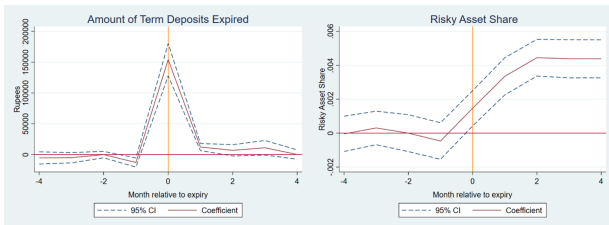
γ_i is the individual dummy variable to absorb differences in individual preferences

λ_t is the month dummy variable to control for time fixed effects

Summary Statistics

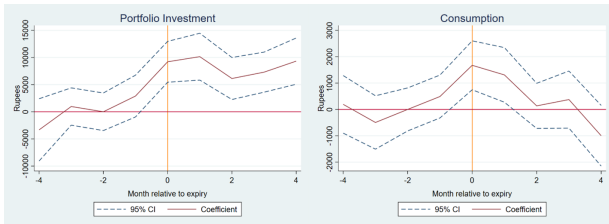
	Number (1)	Mean (2)	SD (3)
Panel A: Demographics			
Age	184,144	46.5	14.7
Female	184,144	0.23	0.43
Married	184,144	0.61	0.49
Panel B: Household Information			
Households with expired term-deposits (in %)	184,144	0.13	0.34
Households with auto-renewal term-deposits (in %)	184,144	0.06	0.24
Households with investments in risky assets (in %)	184,144	0.17	0.38
Households that credit salary (in %)	184,144	0.26	0.44
Panel C: Consumption and Portfolio			
Consumption	1,473,152	22,221	55,448
Investments in Risky Assets	1,473,152	8,518	883,464
Risky Asset Share	1,473,152	0.10	0.26
Panel D: Bank Balances			
Total Term Deposits	1,473,152	314,690	1,885,058
Total Savings	1,473,152	256,509	819,561
Total Bank Deposits	1,473,152	571,288	2,168,905

Event Study



(a) Term Deposits Expired

(b) Risky Asset Share



(c) Portfolio Investments

(d) Consumption

Benchmark Results: Bank Deposits

Dep. Var.:	TD Expired	TD Renewed	Δ Savings
	(1)	(2)	(3)
Treat Indicator	58,857*** (5,700)	13,196*** (4,821)	23,829*** (6,268)
Observations	1,473,152	1,473,152	1,473,152
R-squared	0.265	0.264	0.027
Individual FE	Y	Y	Y
Month FE	Y	Y	Y

Benchmark Results: Financial Portfolio

Dep. Var.:	Investments	Insurance	Risky Asset Share
	(1)	(2)	(3)
Treat Indicator	9,394*** (1,368)	1,574*** (367.8)	0.00359*** (0.000435)
Observations	1,473,152	1,473,152	1,473,152
R-squared	0.050	0.132	0.963
Individual FE	Y	Y	Y
Month FE	Y	Y	Y

Benchmark Results: Spending

Dep. Var.:	Consumption	Loan Repayments
	(1)	(2)
Treat Indicator	796.4** (303.2)	1,638*** (614.7)
Observations	1,473,152	1,473,152
R-squared	0.358	0.187
Individual FE	Y	Y
Month FE	Y	Y

Individual Assets: Stock-Month-Individual

Dep. Var.:	Net Buy	Δ Value	Δ Quantity
	(1)	(2)	(3)
Treat	0.00753*** (0.00274)	0.0794*** (0.0290)	0.0250*** (0.0120)
Beta * Treat	-0.00609*** (0.00194)	-0.0635*** (0.0199)	-0.0181* (0.00923)
Observations	892,576	892,576	892,576
R-squared	0.173	0.163	0.148
Individual FE	Y	Y	Y
Month FE	Y	Y	Y
Stock FE	Y	Y	Y
Individual-Stock FE	Y	Y	Y

Estimates

1. Elasticity

- Interest Elasticity of Consumption: - 0.3
- Interest Elasticity of Investments in Risky Assets: - 26

2. Marginal Propensity out of 100 rupees that have expired in term deposits,

- Renewal of term depositst: 22
- Savings Account: 40
- Risky Investments: 16
- Insurance Premium 3
- Consumption: 1
- Loan Repayment: 3

Effects based on type of term deposits

Dep. Var.:	Investments (1)	Consumption (2)	Δ Savings (3)
Treat Indicator	12,830*** (1,945)	2,238*** (337.6)	37,145*** (8,506)
Autorenewal x Treat	-7,459*** (1,832)	-3,128*** (545.3)	-28,903*** (6,373)
Observations	1,473,152	1,473,152	1,473,152
R-squared	0.050	0.358	0.027
Individual FE	Y	Y	Y
Month FE	Y	Y	Y

Effects based on loan take-up

Dep. Var.:	Investments (1)	Consumption (2)	Δ Savings (3)
Treat Indicator	10,590*** (1,435)	460.5 (321.4)	23,806*** (6,321)
Loan x Treat	-7,045*** (2,408)	1,978** (771.3)	135.2 (7,876)
Observations	1,473,152	1,473,152	1,473,152
R-squared	0.050	0.358	0.027
Individual FE	Y	Y	Y
Month FE	Y	Y	Y

Mechanisms

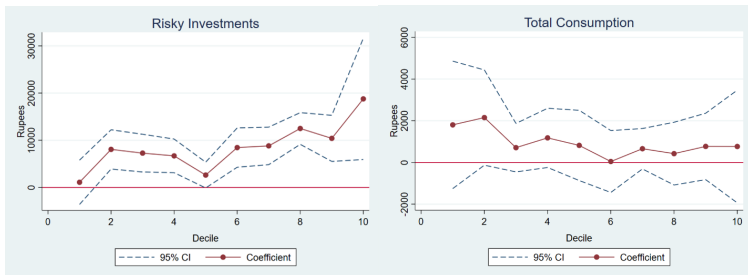
1. Liquidity Channel
2. Rebalancing Channel

Treatment Intensity based on Size of Term Deposits

Dep. Var.:	Investments (1)	Consumption (2)	Risky Share (3)
Treat x TD Size	636.3*** (110.5)	36.06** (16.36)	4.73e-08 (2.72e-05)
Observations	1,473,152	1,473,152	1,473,152
R-squared	0.050	0.358	0.027
Individual FE	Y	Y	Y
Month FE	Y	Y	Y

Heterogeneous Effects on Consumption and Portfolio Allocation by Liquid Savings deciles

Portfolio rebalancing takes place across all the savings deciles, and not just those at the lowest deciles



(a) Investments in Risky Assets

(b) Total Consumption

Treatment Intensity based on Interest Rate

Dep. Var.:	Investments (1)	Consumption (2)	Risky Share (3)
Treat x Interest Rate	1,142*** (156.4)	82.47** (35.55)	0.000437*** (5.08e-05)
Observations	1,473,152	1,473,152	1,473,152
R-squared	0.050	0.358	0.027
Individual FE	Y	Y	Y
Month FE	Y	Y	Y

Robustness

- Focus on salary creditors only
- Focus on non-expired Term Depositors only
- Vary the time period
- Little leakage based on term depositors withdrawal

Conclusion

- Provide direct evidence of monetary transmission mechanisms through households using micro-level administrative data from India
- Results suggest that savers rebalance their portfolio, shifting from safe assets to more risky assets
- Term deposits contract rigidity and household wealth affects the monetary policy pass-through