Peer Distress & Individual Leverage

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NYU Empirical Household Finance Class (Session II)

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Motivation

- Household leverage plays a key role in driving economic fluctuations (Mian, Sufi and Verner 2016)

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- Household leverage plays a key role in driving economic fluctuations (Mian, Sufi and Verner 2016)
- Understanding the determinants of leverage choices is important
- I explore the role of preferences and beliefs about distress as a potential determinant of the *demand* for leverage

Peer Distress Experiences

- Examine the effect of peer experiences of distress on individual leverage and borrowing behavior
  - Important source of information on cost of distress

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  - Important source of information on cost of distress
  - Preferences
- Peer effects of distress can potentially aggregate up to have macro-economic implications
  - For instance, over 6 million individuals defaulted on some type of loan in 2016 alone

Main Findings

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Estimates suggest that such peer effects can potentially explain a decline of up to \$213.31 B in household debt over a four year period between 2011 and 2015 (1.82% of total hh debt in Jan 2011)

Credit & Employment Data

- Anonymized data covering between 2010-2015 comes from Equifax Inc, and has two components - credit and employment
- Information on credit histories of over **220 million individuals** (i.e. the entire population with a credit history)
  - Account level information that includes information on all accounts under collections and bankruptcy filings
- Administrative payroll information on over 5500 firms employing **30 million individuals**
  - Firm identity, employment status, total income, salary, bonus and commissions, salaried vs hourly, hourly wages, number of hours worked, job title and tenure

Empirical Challenges

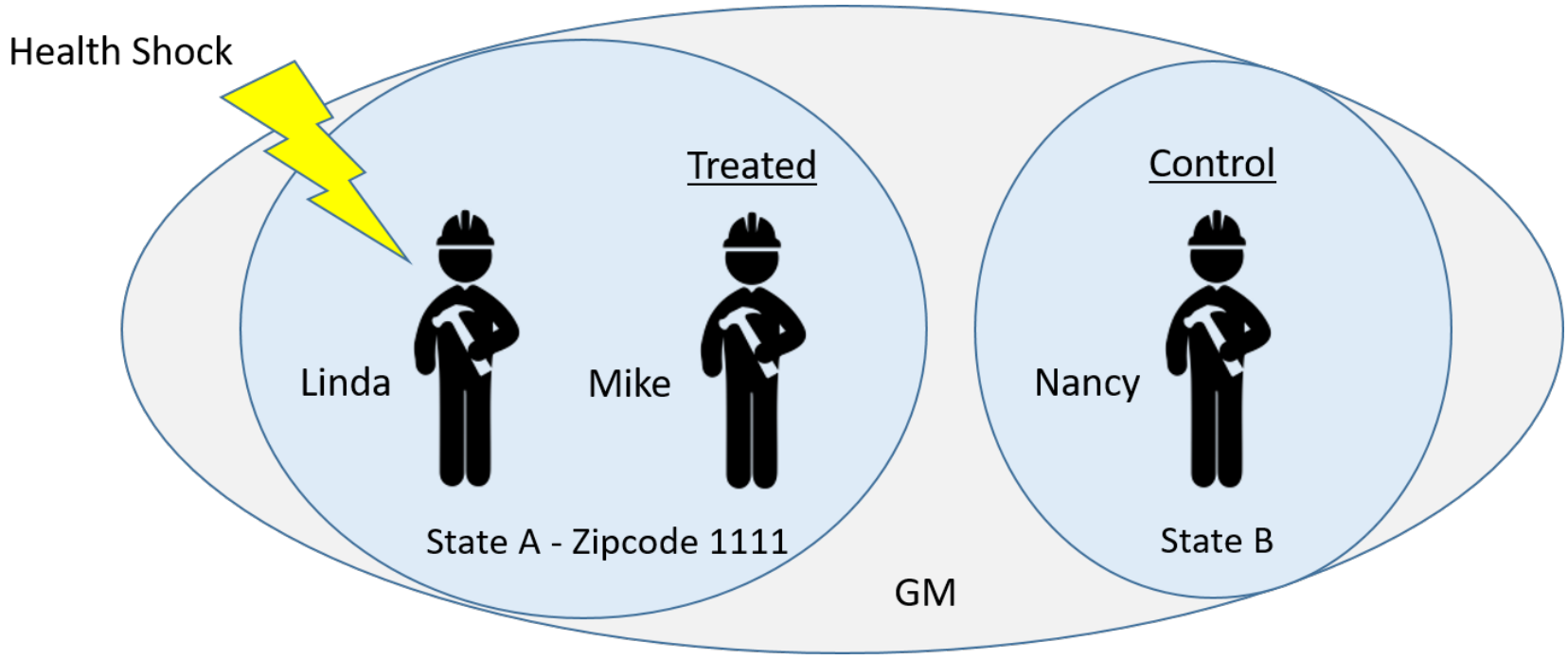
- Definition of *relevant network or reference group*
  - Ideally, one would like to observe individual interactions with their peers
- Peers defined as individuals who live in the same zipcode, work for the same firm with the same job role/title
- Assumption: Co-workers interact with each other and will be exposed to each others' distress experiences
  - Individuals spend most of their day with "co-workers" (De Giorgi et al (2016))
  - Friendship often causes co-workership due to job search strategies (Montgomery, 1991)

Empirical Challenges

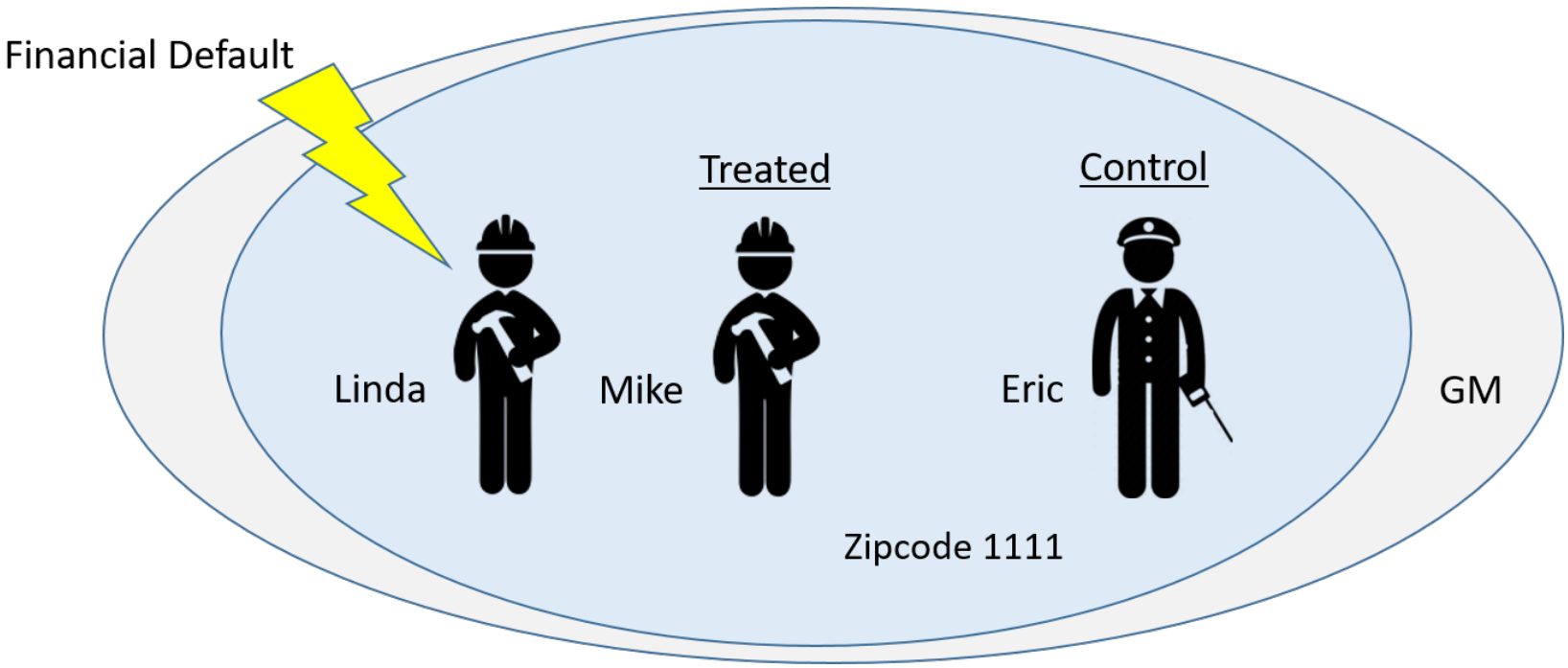
- Ommitted variable problem: common shocks
  - E.g. firm level shocks

- Use difference-in-differences setting to overcome this common shock problem

Empirical Design I



Empirical Design II

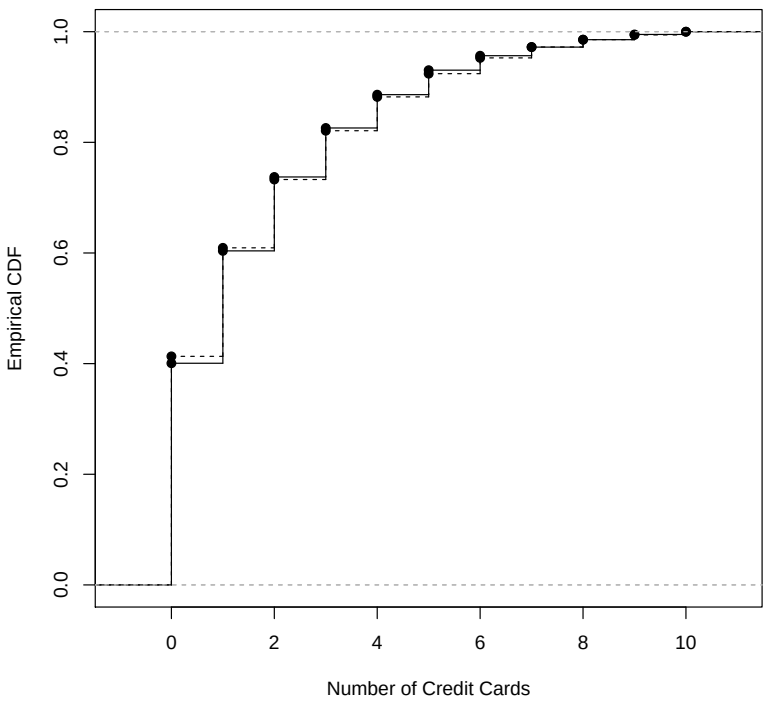


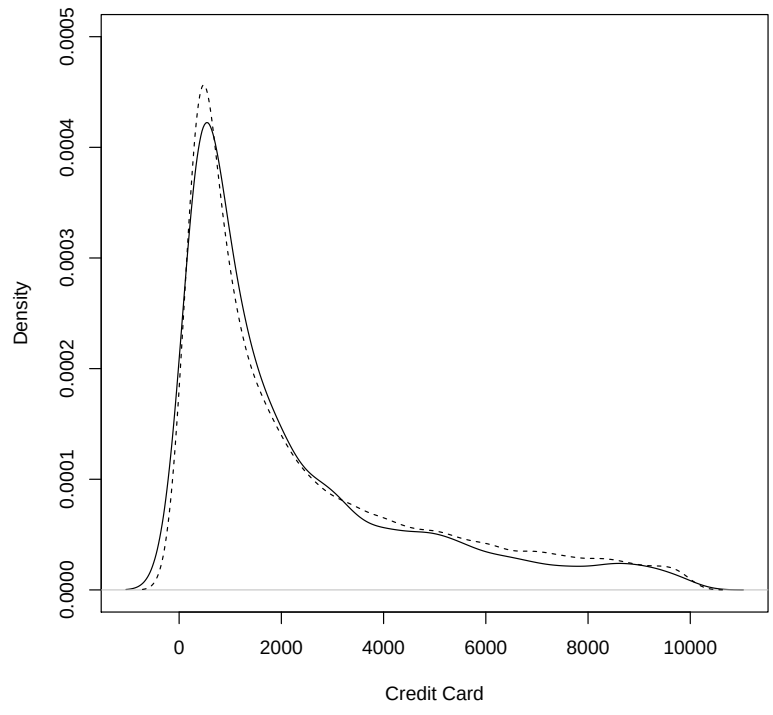
Empirical Specification

$$y_{it} = \delta_{e \times i} + \delta_{e \times t} + \beta \times PeerShock_i \times Post_t + \gamma \times X_{it} + \epsilon_{it}$$

- Each observation represents an individual-month
- y_{it} represents different measures of borrowing for individual i, in month t
  - Leverage, Total Debt, Credit Card Debt, Auto Loans, Mortgage Loans, Delinquencies, Credit Scores
- $PeerShock_i \times Post_t$ is the difference-in-differences expression that takes a value of one for individuals whose peers defaulted on their medical bills during the months following default
- $\delta_{e \times i}$ are event x individual fixed effects, $\delta_{e \times t}$ are event x year-month fixed effects
- X_{it} are a set of controls including $Income$, $Income^2$ and Age

Sample Representativeness - Credit Card Borrowing

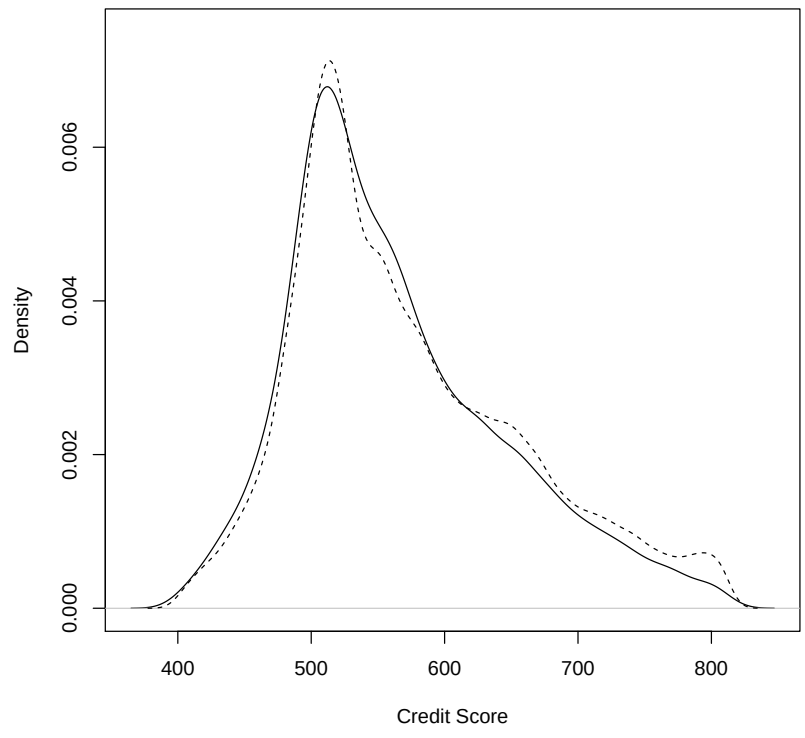




Credit Card Borrowing

Auto Loans Home Loans

Sample Representativeness - Credit Score



Credit Score

Findings

- How does peer distress affect individual leverage and debt?

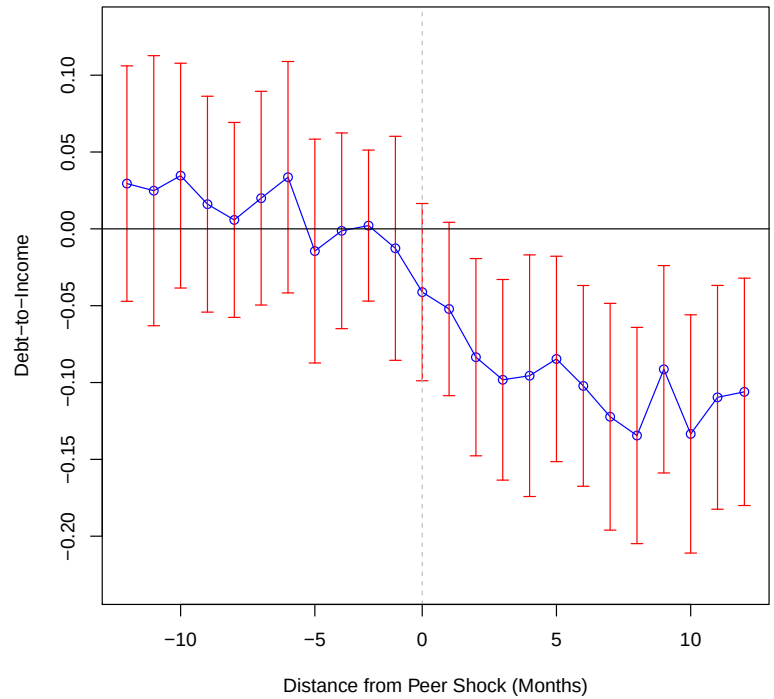
Peer Financial Distress & Individual Leverage

	Leverage	Debt	Leverage	Debt
	(1)	(3)	(4)	(6)
PeerShock × *Post*	-0.116***	-2,541.28***	-0.092***	-2,357.05***
	(0.024)	(593.36)	(0.026)	(684.01)
Controls	No	No	Yes	Yes
Individual x Event FE	Yes	Yes	Yes	Yes
Month x Event FE	Yes	Yes	Yes	Yes
Observations	6,496,191	11,496,255	6,128,418	6,128,418
R2	0.709	0.841	0.763	0.850

- Debt-to-income ratio declines by 5.7% relative to the sample mean

Robust

Peer Financial Distress & Individual Leverage



- No pre-trends in debt-to-income ratio and total debt across treated and control individuals
- Debt-to-income ratio and total debt decline significantly for treated individuals following peer shocks

Findings

1. Peer financial distress leads to a decline in individual leverage and debt
    - What type of debt do individuals reduce?

Peer Financial Distress & Components of Debt

	Credit Card	Auto	Home Loans	Credit Card	Auto	Home Loans
	(1)	(2)	(3)	(4)	(5)	(6)
PeerShock × *Post*	-136.61***	-126.49***	-1,768.95***	-127.51***	-97.49**	-1,770.65***
	(41.82)	(37.28)	(487.51)	(46.48)	(49.21)	(573.64)
Controls	No	No	No	Yes	Yes	Yes
Individual x Event FE	Yes	Yes	Yes	Yes	Yes	Yes
Month x Event FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,496,255	11,496,255	11,496,255	6,128,418	6,128,418	6,128,418
R2	0.756	0.599	0.827	0.772	0.619	0.837

- Credit card debt declines by 5.4% relative to the sample mean
- Auto and Home loans decline by 3% and 4.8% respectively

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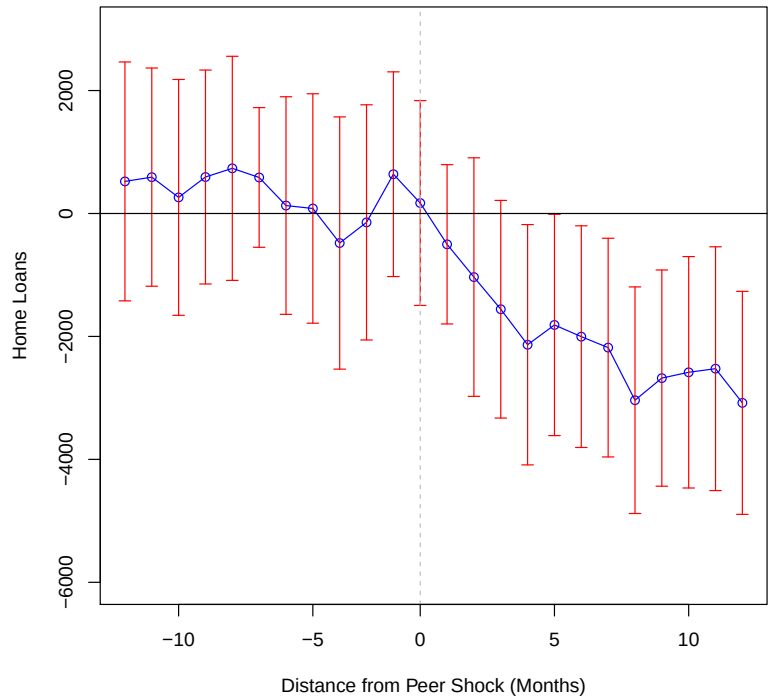

- No pre-trends in credit card debt and home loans across treated and control individuals
- Credit card debt and home loans decline significantly for treated individuals following peer shocks

Findings

1. Peer financial distress leads to a decline in individual leverage and debt
   - Individuals reduce all forms of debt
   - How does this reduction occur?
     - Are individuals prepaying their existing debt or borrowing less?
     - Does the adjustment occur on the intensive or extensive margin?

How Do Individuals Reduce Credit Card Debt?

	Payment	Openings	Spending	Utilization	Payment	Openings	Spending	Utilization
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$PeerShock \times Post$	-7.78	-0.0002	-27.86***	-0.019***	-9.32	-0.00002	-22.10**	-0.014***
	(11.73)	(0.0002)	(7.42)	(0.006)	(12.94)	(0.0003)	(9.62)	(0.005)
Controls	No	No	No	No	Yes	Yes	Yes	Yes
Individual x Event FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month x Event FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,496,255	5,139,155	9,352,950	5,139,155	6,128,418	3,204,803	5,709,753	3,204,803
R2	0.057	0.528	0.714	0.592	0.070	0.547	0.732	0.607

- Treated individuals don't prepay their existing accounts and are not less likely to open new Credit Count accounts
- Conditional on having a Credit Card account, they spend less on it and have higher access to liquidity in terms of unutilized credit

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   - Individuals reduce all forms of debt
   - Borrow less on the intensive margin while paying higher fractions of their debt

Peer Financial Distress & Labor Market Outcomes

	Income	Employment	Income	Employment
	(1)	(2)	(3)	(4)
$PeerShock \times Post$	34.85	-0.003	34.16	-0.003
	(31.98)	(0.005)	(31.61)	(0.005)
Controls	No	No	Yes	Yes
Individual x Event FE	Yes	Yes	Yes	Yes
Month x Event FE	Yes	Yes	Yes	Yes
Observations	6,496,191	11,496,255	6,128,418	6,128,418
R2	0.647	0.821	0.652	0.832

- No difference in Income and Likelihood of Employment across treated and control individuals

Findings

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   - Individuals reduce all forms of debt
   - Borrow less on the intensive margin while paying higher fractions of their debt
   - Save more while their income remains constant

Consequences of Lower Borrowing

	Delinquency	Credit Score	Delinquency	Credit Score
	(1)	(3)	(4)	(6)
$PeerShock \times Post$	-0.003***	10.45*	-0.001**	9.81*
	(0.001)	(6.05)	(0.0005)	(5.91)
Controls	No	No	Yes	Yes
Individual x Event FE	Yes	Yes	Yes	Yes
Month x Event FE	Yes	Yes	Yes	Yes
Observations	11,496,255	11,496,255	6,128,418	6,128,418
R2	0.735	0.851	0.747	0.867

- Treated individuals are less likely to become delinquent and have better credit scores

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Mechanism

- Learning Channel
  - Individuals learn that it is more cost or likely to experience distress than they expected
  - Changes in Preferences

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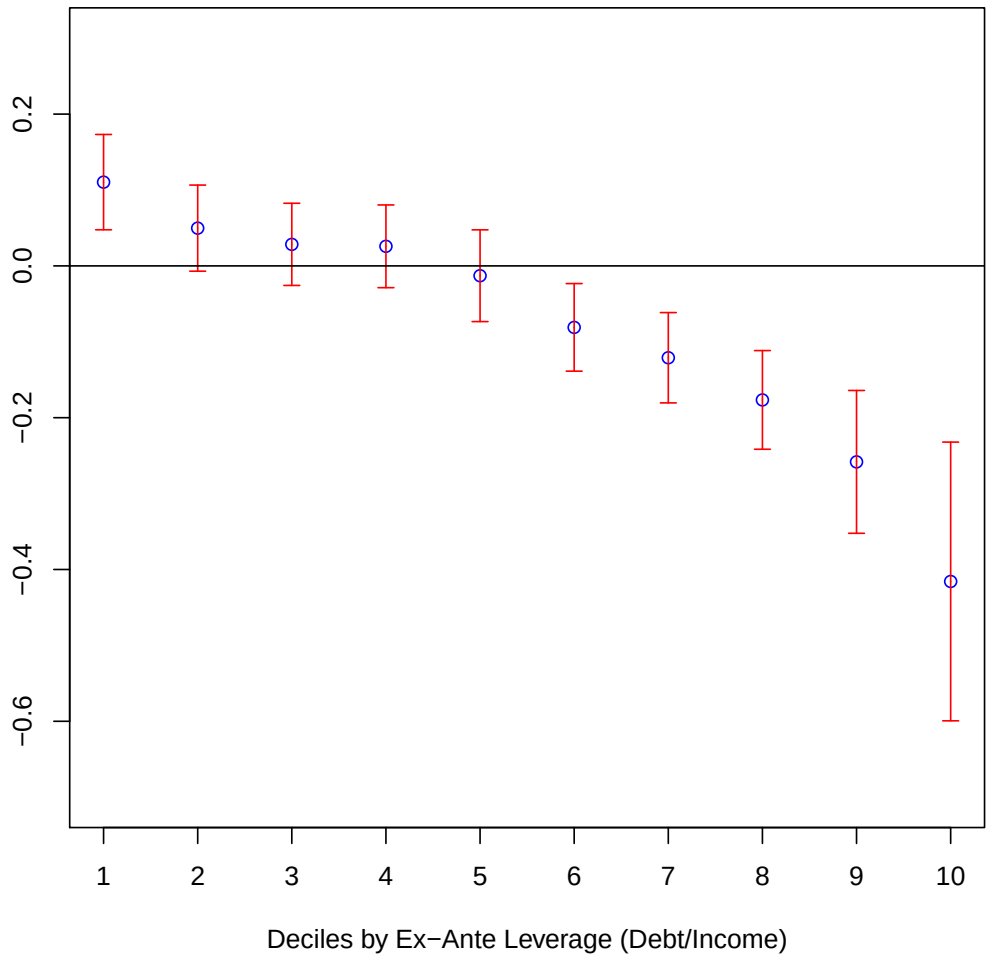
  - Changes in Preferences
- Peer effects of consumption - Keeping up with the Joneses'

Heterogeneity by Cost of Peer Distress

	Leverage	Debt
	(1)	(2)
$PeerShock \times Post \times NoRestriction$	-0.122***	-3,226.12***
	(0.031)	(809.76)
$PeerShock \times Post \times MediumRestriction$	-0.087**	-1,594.88*
	(0.039)	(883.66)
$PeerShock \times Post \times SevereRestriction$	-0.027	-983.17
	(0.034)	(252.62)
NoRestriction-SevereRestriction	-0.095**	-2242.95***
Controls	Yes	Yes
Individual x Event FE	Yes	Yes
Month x Event FE	Yes	Yes
State x Event FE	Yes	Yes
Observations	6,128,418	6,128,418
R2	0.767	0.853

- Peer distress has a stronger effect on individual borrowing in states where cost of financial distress is higher

Heterogeneity by Ex-Ante Leverage



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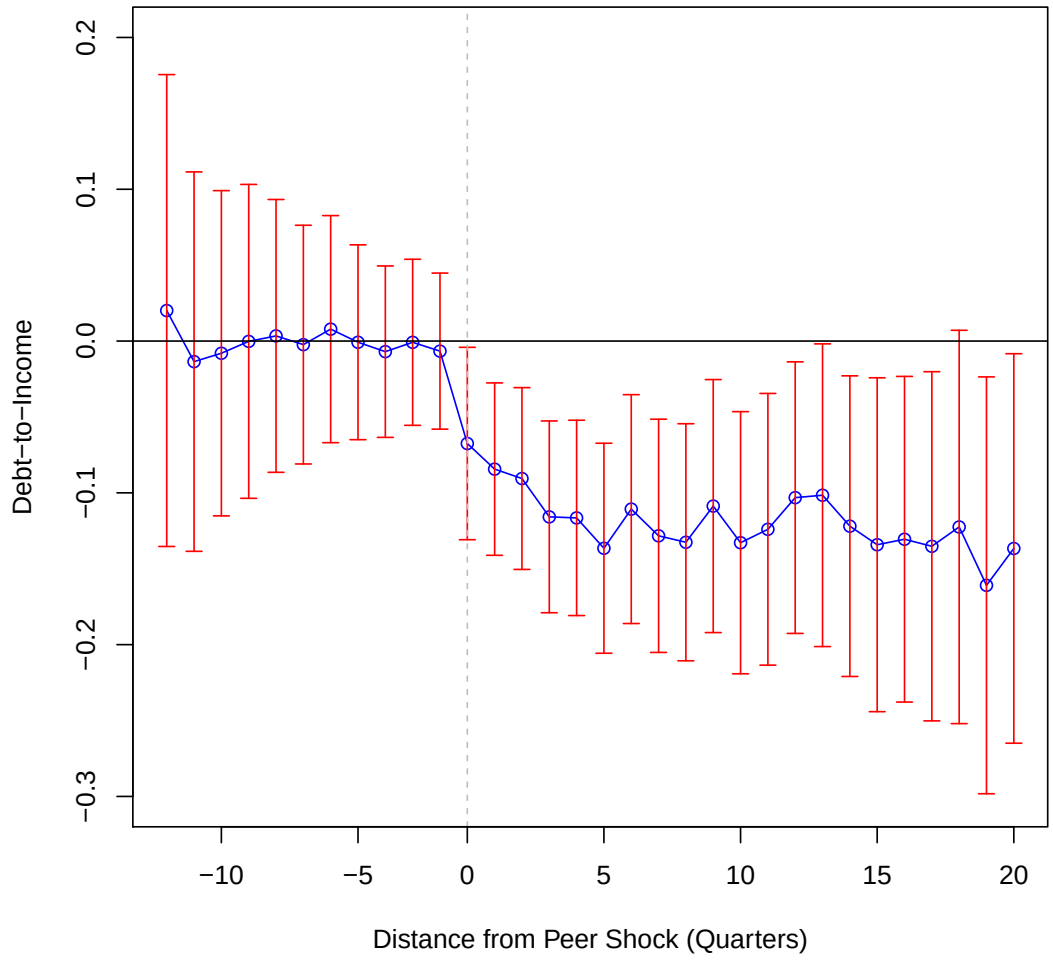
Long Term Effects: Beliefs vs Over-reaction/Salience



- Suggests that the results are not driven by over-reaction/salience

Learning vs Peer Effects of Consumption

	Leverage	Debt
	(1)	(2)
$PeerShock \times Post \times Peer$	-0.110***	-2,402.96***
	(0.025)	(882.11)
$PeerShock \times Post \times Non-Peer$	-0.104**	-2,319.02***
	(0.032)	(647.93)
Peer-(Non-Peer)	-0.006	-83.94
Controls	Yes	Yes
Individual x Event FE	Yes	Yes
Month x Event FE	Yes	Yes
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R2	0.765	0.852

- Effect of peer financial distress on individual leverage is statistically indistinguishable across individuals who continue to be peers vs those that do not
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Robustness

- Stronger results for peers who are likely to be closer to each other
  - Individuals have worked together for longer period of time
  - Smaller age difference between peers
  - Smaller peer groups
  - Broad to narrow definition
- Use Health shock with second specification - i.e. with within firm-ZIPcode variation
  - Additional test that controls for economic conditions at zipcode level and finds similar results

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Results indicate that peer effects can contribute to de-leveraging following times when many individuals experience distress