

ECON 747 – LECTURE 14:  
INCOME INEQUALITY, FINANCIAL INTERMEDIATION, AND  
SMALL FIRMS

Thomas Drechsel

University of Maryland

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## BACKGROUND

- ▶ This lecture is based on my joint work with Sebastian Doerr (BIS) and Donggyu Lee, a former UMD student
- ▶ It fits well into the financial intermediation part of the course, and links to other interesting economic trends

## MOTIVATION

- ▶ US top 10% income share increased from around 30% in 1970 to 50% today
- ▶ Ongoing debate on causes and consequences:
  - ▶ **Causes:** globalization, skill-biased technical change, superstar firms, taxation, . . .
  - ▶ **Consequences:** voting behavior, household consumption, demand, indebtedness, . . .
- ▶ Little insight on consequences of rising top household income shares for firms
- ▶ This paper:
  - What are the effects of higher income inequality for small firm job creation?*

## THIS PAPER

- ▶ Increasing top income shares reduce job creation by small firms
- ▶ Propose and test novel economic mechanism
  - ▶ Higher income earners hold relatively fewer bank deposits, more stocks, bonds, . . .
  - ▶ Small firms are bank-dependent, banks rely on deposits to fund them
  - ▶ If relatively more income accrues to top earners:
    - ⇒ aggregate deposits fall
    - ⇒ banks have fewer resources to lend
    - ⇒ small firms create fewer jobs than large firms
- ▶ 10 p.p. increase in the top 10% income share reduces net job creation by small firms by 1.5 – 2 pp relative to large firms

## STRATEGY OF THIS PAPER

### 1. Motivating observations → hypothesize mechanism

- ▶ Financial asset allocation by household income group
- ▶ Bank dependence of small firms

### 2. Empirical analysis

- ▶ Exploit variation in top income shares across US states from 1980 to 2015
- ▶ Outcome variable is net job creation rate across firm sizes
- ▶ State-firm size-time variation allows inclusion of state\*time FE
- ▶ Develop Bartik-style IV approach (leave-one-out)

### 3. Structural model

- ▶ Incomplete markets, heterogeneous households, heterogeneous firms, banking sector
- ▶ Households trade off liquidity insurance and higher returns
- ▶ Bank-firm relationship subject to information friction

## PREVIEW OF EMPIRICAL FINDINGS

- ▶ 10 p.p. increase in the top 10% income share reduces net job creation by small firms by 1.5 – 2 p.p. relative to large firms
- ▶ Evidence on the mechanism (state-level):
  - ▶ Effect is declining in firm size
  - ▶ Effect is increasing in income threshold (10% vs. 5% vs. 1%)
  - ▶ Effect is stronger in industries with higher bank dependence
  - ▶ Effect is stronger in states where median bank smaller & where more banks/capita
- ▶ Evidence on the mechanism (bank-level):
  - ▶ Higher top income shares in headquarter state reduce deposits, rise interest expenses
  - ▶ ... and reduce C&I loans, increase interest income

## PREVIEW OF MODEL

- ▶ Two key components
  1. Household portfolio choice between high-return direct investments and low-return deposit holdings that insure against expenditure shocks
  2. Credit market in which bank writes risky debt contracts with individual firms subject to costly-state-verification friction
- ▶ Deposit market connects components in general equilibrium
- ▶ Perturb income distribution to feature higher top income share but same mean
  - ▶ Deposits ↓, safe rate ↑ & loan rates ↑, loan amounts ↓ & job creation ↓
  - ▶ Channel is stronger where financial frictions are more severe

## STRUCTURE OF THE PRESENTATION

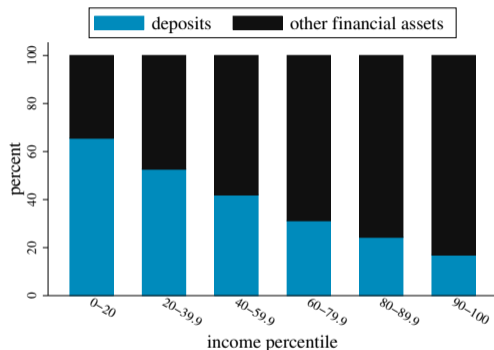
1. Motivating observations and proposed channel
2. Empirical analysis
3. Structural model
4. Conclusion



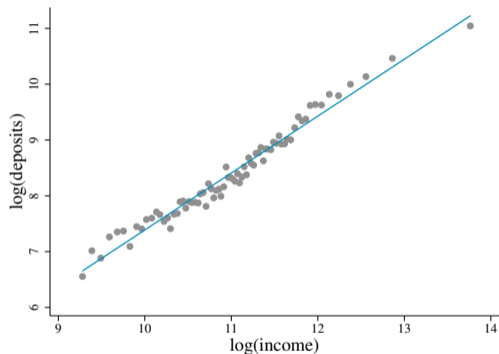
## MOTIVATING OBSERVATIONS AND PROPOSED CHANNEL

# HOUSEHOLD INCOME AND FINANCIAL ASSET ALLOCATION

SOURCE: SURVEY OF CONSUMER FINANCES



(A) Deposit shares across income groups



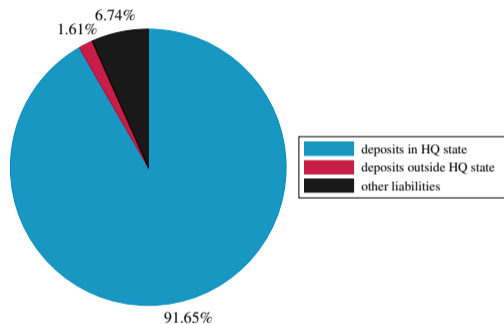
(B) Absolute deposit holdings by income

- ▶ Higher income households hold fewer deposits relative to financial assets
- ▶ In absolute terms, higher income households hold more deposits

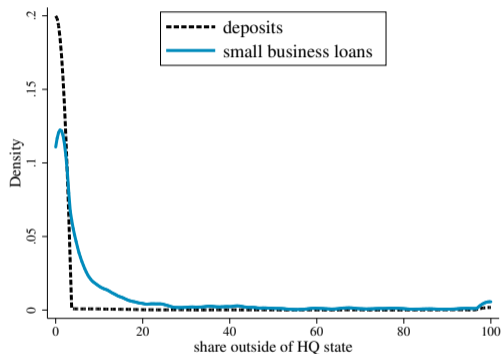
More SCF patterns

# DESPOSITS AND SMALL BUSINESS LOANS

SOURCE: FEDERAL DEPOSIT INSURANCE CORPORATION



(C) Deposits held inside banks' HQ state



(D) Distribution

- ▶ Deposits, in particular in headquarter state, major source of bank funding
- ▶ Only 2% of banks hold > 10% of their deposits outside headquarter state

## DEPOSITS, BANKS, AND SMALL FIRMS

- ▶ Importance of deposits for US banking system
  - ▶ Causal evidence that changes in deposits drive bank lending: Becker (2007), Gilje, Loutskina, and Strahan (2016), ...
- ▶ Importance of bank funding for small firms
  - ▶ Banks have a comparative advantage in screening and monitoring borrowers
  - ▶ Smaller firms are opaque and depend relatively more on bank lending (Petersen and Rajan, 1994; Beck and Demirguc-Kunt, 2006)

## THE MECHANISM

- ▶ Taking stock:
  - ▶ Low-income households hold relatively more, but absolutely fewer deposits
  - ▶ Absolute deposit holdings rise more with income for low-income households
  - ▶ Banks need deposits and small firms need banks

- ▶ Based on observations, hypothesis:

*As top incomes rise, a relatively smaller share of total financial savings is held as deposits and intermediated via banks. Since banks have a comparative advantage in screening and monitoring opaque firms, this leads to a relative decline in financing for small firms. In turn, small firms create fewer jobs.*

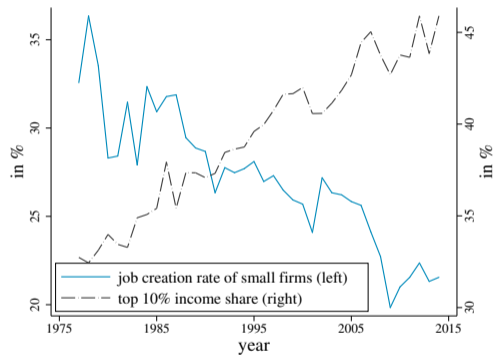
## EMPIRICAL ANALYSIS

## DATA

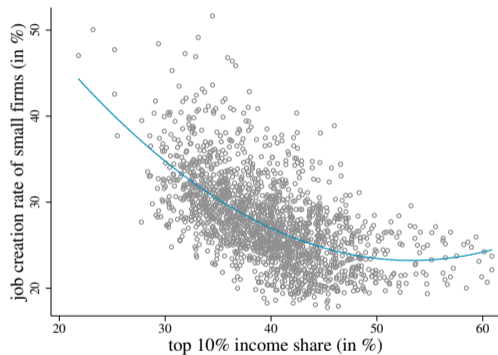
- ▶ **Business Dynamics Statistics:** net job creation rate by state-firm size-year cell
- ▶ **Frank (2009):** annual state-level top 10%, 5%, 1%, and 0.1% income shares
- ▶ **Final sample:** 19,176 state-firm size-year obs for 47 states from 1981 to 2015
  - ▶ Average net job creation rate by small firms equals 2.3%, for all firms 1.8%
  - ▶ Average top 10% income share equals 40.5%
- ▶ **Call Reports:** bank-level income statement and balance sheet data
  - ▶ Used to test whether mechanism works through deposit supply

Summary stats

# INEQUALITY AND SMALL FIRM JOB CREATION IN THE DATA



(A) Variation across time



(B) Variation across states



## EMPIRICAL STRATEGY: BASELINE SPECIFICATION

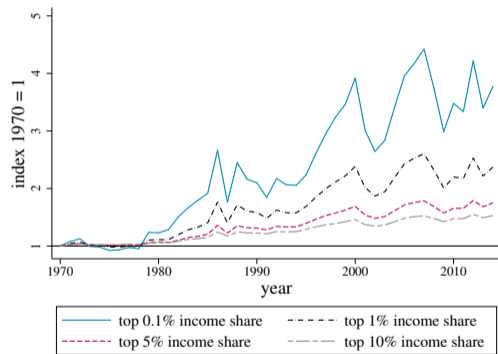
$$njc_{s,f,t} = \beta_1 \text{top } 10\%_{s,t-1} + \beta_2 \text{very small firm}_f \\ + \beta_3 \text{top } 10\% \times \text{very small firm}_{s,f,t-1} + \text{ctrls}_{s,t-1} + \theta_{s,f} + \tau_{s,t} + \epsilon_{s,f,t}$$

- ▶ Variation across state ( $s$ ), firm size ( $f$ ), year ( $t$ )
- ▶  $njc$ : annual net job creation rate
- ▶  $\text{top } 10\%$ : top 10% income share
- ▶  $\text{very small firm}_f$ : dummy for firms with 1 to 9 employees
- ▶  $\text{controls}$ : log pop, unemployment rate, average income per capita growth, share of pop aged 60 and above, share of black pop., and Gini index
- ▶  $\theta_{s,f}$ : state or state\*firm size fixed effect
- ▶  $\tau_{s,t}$ : time or state\*time fixed effects

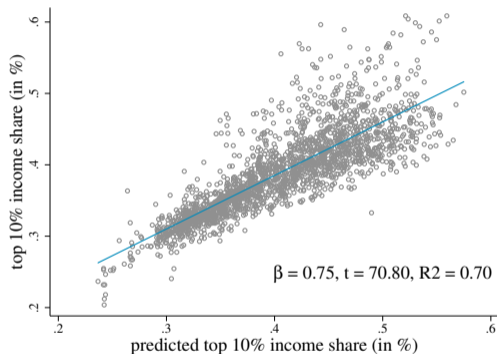
## REMARKS ON IDENTIFICATION STRATEGY

- ▶ State\*time FE take care of a range of concerns around omitted variables
  - ▶ Globalization, skill-based technical change, ...
- ▶ Reverse causality – e.g. shifts in firm growth that feed back predominantly to income of high earners – would need to occur within state-firm size-year cells
  - ▶ Note that we lag the top income share by one year and interact our controls with the ‘very small firm’ dummy
  - ▶ Note also that members of the top 10% income group are not only CEOs, but physicians, lawyers, ... Who are the top 10%?
- ▶ In addition, Bartik IV approach (‘leave one out’)
  - ▶ Predict evolution in state-level top income shares based on each state’s 1970 top income share adjusted for national trend, use predicted shares as IV for actual ones

# ILLUSTRATION OF BARTIK IV



(A) Aggregate trends



(B) First stage correlation

## MAIN RESULTS

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	net JCR	net JCR	net JCR	net JCR	IV net JCR	IV net JCR	IV net JCR	IV net JCR
top 10% income share	0.025 (0.019)				-0.114 (0.200)			
very small firm (1-9)	0.073*** (0.008)	0.073*** (0.008)	0.091*** (0.018)		0.110*** (0.010)	0.110*** (0.010)	0.133*** (0.022)	
top 10% × very small firm (1-9)	-0.162*** (0.020)	-0.162*** (0.020)	-0.122*** (0.018)	-0.150*** (0.030)	-0.253*** (0.026)	-0.253*** (0.026)	-0.225*** (0.027)	-0.309*** (0.040)
Observations	16,450	16,450	16,450	16,450	16,450	16,450	16,450	16,450
R-squared	0.273	0.391	0.393	0.439				
State FE	✓	-	-	-	✓	-	-	-
State*Size FE	-	-	-	✓	-	-	-	✓
Year FE	✓	-	-	-	✓	-	-	-
State*Year FE	-	✓	✓	✓	-	✓	✓	✓
Controls	✓	-	× tiny	× tiny	✓	-	× tiny	× tiny
Cluster	State	State	State	State	State	State	State	State
F-stat	-	-	-	-	150.02	152.36	88.24	198.56

- ▶ Rise in top 10% share of 10pp ⇒ relative decline in net JCR by small firms of 2pp
- ▶ IV estimates larger (columns 5-8)

## EVIDENCE ON MECHANISM

- ▶ Following the main results, we provide evidence on the mechanism
  1. Firm size and income thresholds
  2. Industry level regressions and bank dependence
  3. Bank-level results

## MECHANISM 1: FIRM SIZE AND INCOME THRESHOLDS

- ▶ Firm size and informational frictions:
  - ▶ Small firms are informationally opaque
  - ▶ Banks have a comparative advantage in screening and monitoring small firms
  - ⇒ Effect should be more pronounced for more opaque (smaller) firms
  
- ▶ Share of deposits out of financial wealth:
  - ▶ Share of deposits is declining in income
  - ▶ Increase in income share for higher percentiles implies even fewer deposits available
  - ⇒ Effect should be stronger for higher top income thresholds

# MECHANISM 1: FIRM SIZE AND INCOME THRESHOLDS

VARIABLES	(1) net JCR	(2) net JCR	(3) net JCR	(4) net JCR	(5) net JCR	(6) low BD net JCR	(7) high BD net JCR
top 10% × very small firm (1-9)	-0.360*** (0.032)			-0.490*** (0.031)	-0.493*** (0.030)	-0.367*** (0.029)	-0.752*** (0.046)
top 10% × small firm (10-99)	-0.066*** (0.017)						
top 10% × medium firm (100-249)	-0.042** (0.020)						
top 5% × very small firm (1-9)		-0.326*** (0.025)					
top 1% × very small firm (1-9)			-0.410*** (0.033)				
Observations	16,450	16,450	16,450	298,834	298,759	97,260	88,112
State*Size FE	✓	✓	✓	✓	✓	✓	✓
State*Year FE	✓	✓	✓	✓	-	-	-
State*Naics*Year FE	-	-	-	-	✓	✓	✓
Cluster	State	State	State	State	State	State	State
F-stat	129.31	166.18	100.79	332.67	332.20	334.88	329.38

- ▶ Column (1): effect is decreasing in firm size
- ▶ Columns (1)–(3): effect is increasing in income threshold

## MECHANISM 2: INDUSTRY-LEVEL AND BANK-DEPENDENCE

- ▶ Construct our baseline regression also at the state-industry-firm size-year level using the corresponding information in the BDS:

$$\begin{aligned} net\ jcr_{s,i,f,t} = & \gamma_1 \text{ top } 10\% \text{ income share}_{s,t-1} + \gamma_2 \text{ very small firm}_f \\ & + \gamma_3 \text{ top } 10\% \text{ income share} \times \text{very small firm}_{s,f,t-1} \\ & + \theta_{s,f} + \tau_{s,i,t} + \epsilon_{s,i,f,t}. \end{aligned}$$

- ▶ Allow for state\*industry\*time fixed effects ( $\tau_{s,i,t}$ )
- ▶ If rising top income shares reduce bank lending to small firms, the effect should be stronger for firms that rely more on banks, so we expect

$$\gamma_3^{high\ BD} < \gamma_3^{low\ BD}$$

(using measure from Survey of Business Owners of US Census)



## MECHANISM 2: INDUSTRY-LEVEL AND BANK DEPENDENCE

VARIABLES	(1) net JCR	(2) net JCR	(3) net JCR	(4) net JCR	(5) net JCR	(6) low BD net JCR	(7) high BD net JCR
top 10% × very small firm (1-9)	-0.360*** (0.032)			-0.490*** (0.031)	-0.493*** (0.030)	-0.367*** (0.029)	-0.752*** (0.046)
top 10% × small firm (10-99)	-0.066*** (0.017)						
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Observations	16,450	16,450	16,450	298,834	298,759	97,260	88,112
State*Size FE	✓	✓	✓	✓	✓	✓	✓
State*Year FE	✓	✓	✓	✓	-	-	-
State*Naics*Year FE	-	-	-	-	✓	✓	✓
Cluster	State	State	State	State	State	State	State
F-stat	129.31	166.18	100.79	332.67	332.20	334.88	329.38

- ▶ Columns (4)-(5): results hold in state-industry-firm size-year level regressions
- ▶ Columns (6)-(7): stronger effect industries with high bank-dependence

## MECHANISM 3: BANK-LEVEL RESULTS

- ▶ Our mechanism works through deposit supply: predicts that higher top income shares suppresses amount of bank deposits, increases interest rates on deposits
- ▶ To provide direct evidence, we estimate the following bank-level 2SLS regression:

$$y_{b,t} = \delta \text{ top } 10\% \text{ income share}_{s,t-1} \\ + \text{controls}_{b,t-1} + \text{controls}_{s,t-1} + \theta_b + \tau_t + \epsilon_{b,t}.$$

- ▶  $y_{b,t}$ : log amount of total deposits or the ratio of deposit expenses to total deposits of bank  $b$  headquartered in state  $s$  in year  $t$  (from Call Report data)
- ▶ Also look at C&I loan supply and interest rate income on C&I loan (available for subset of banks)

## MECHANISM 3: BANK-LEVEL RESULTS

VARIABLES	(1) log(dep)	(2) log(dep)	(3) log(dep)	(4) dep rate	(5) dep rate	(6) dep rate	(7) log(CI)	(8) CI rate
top 10% income share	-2.328*** (0.576)			2.652*** (0.645)			-2.405*** (0.657)	11.655** (4.843)
top 5% income share		-2.652*** (0.764)			2.912*** (0.800)			
top 1% income share			-4.928*** (1.134)			2.942*** (1.077)		
Observations	242,651	242,651	242,651	242,651	242,651	242,651	112,393	112,393
Bank FE	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Cluster	State	State	State	State	State	State	State	State
F-stat	48.70	30.00	12.50	48.70	30.00	12.50	35.02	27.59

- ▶ Results consistent with deposit supply reduction driven by higher top incomes
- ▶ Effects stronger for higher top income thresholds
- ▶ Higher top incomes also reduce banks' C&I lending, increase interest income

## TAKING STOCK

- ▶ Main result:
  - ▶ Rising top income shares reduce net job creation by small firms
- ▶ Evidence on mechanism:
  - ▶ Effect is declining in firm size (reflecting lower informational frictions)
  - ▶ Effect is increasing in income threshold (reflecting declining share of deposits)
  - ▶ Effect stronger for small firms in sectors with higher bank dependence
  - ▶ Rising top income shares reduce deposits, increase deposit expenses
  - ▶ Rising top income shares reduce C&I loans, increases interest income

## FURTHER RESULTS AND ROBUSTNESS

- ▶ Results on bank size
  - ▶ Main results stronger in states where median bank smaller
  - ▶ Main results stronger in states with more banks per capita
  - ▶ Effects on deposits and loans significantly less pronounced for larger banks [details](#)
- ▶ Different outcome variables
  - ▶ Job creation falls (in relative terms) among new entrants and continuing small firms
  - ▶ Effect among continuing firms is economically larger
  - ▶ Number of small firms declines, so does reallocation rate among small firms [details](#)
- ▶ Robustness
  - ▶ Exclude recessions, exclude states with high VC activity, exclude non-tradable industries, control for industry concentration . . . [details](#)

## STRUCTURAL MODEL

## PURPOSE OF THE MODEL

1. Formally examine the link between top incomes, financial intermediation and small firm job creation in a tractable framework
2. Quantitatively analyze job creation patterns under counterfactual income distributions, and assess the relative importance of different frictions

## MODEL SETUP

- ▶ Three period structure  $t = 1, 2, 3$
- ▶ Agents:
  - ▶ Heterogeneous households
  - ▶ Representative 'public' firm
    - ▶ Access to frictionless capital market
  - ▶ Heterogeneous 'private' firms
    - ▶ Information frictions, bank-dependent
  - ▶ Representative bank

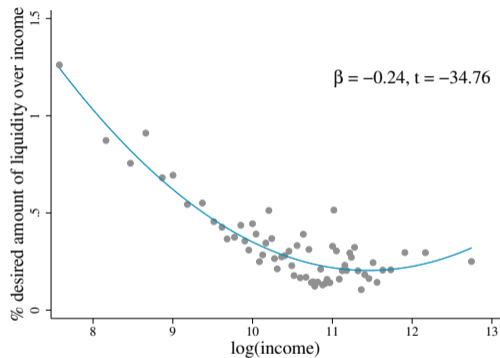


## HOUSEHOLDS

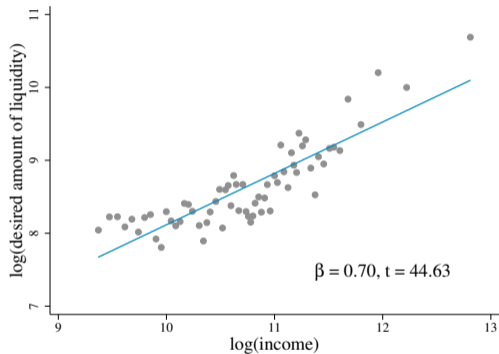
- ▶ Unit mass, indexed by  $i$ , differ in terms of initial endowment income  $y_{i,1}$
- ▶ In  $t = 1$ , allocate income between:
  - ▶ Consumption
  - ▶ Deposits  $\rightarrow$  receive  $r^d$
  - ▶ Direct capital investment  $\rightarrow$  receive  $r^k$
- ▶ In  $t = 2$ , liquidity shock:
  - ▶ Need to cover a stochastic expenditure  $l_i \sim [0, \bar{l}_i]$
  - ▶ Can only use deposits
- ▶ In  $t = 3$ , receive returns on asset balances, labor income (if employed), profits

# DIRECT EVIDENCE ON LIQUIDITY NEEDS BY INCOME

SOURCE: SURVEY OF CONSUMER FINANCES



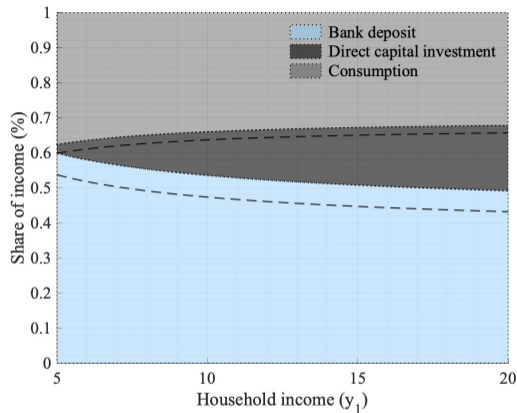
(A) Desired liquidity share by income



(B) Desired amount of liquidity by income

- Specify  $\bar{\ell}_i = e^{\lambda_0} * y_{i,1}^{\lambda_1}$  and calibrate  $\lambda_0, \lambda_1$  to the data

## HOUSEHOLD DECISIONS



- ▶ More income  $\rightarrow$  more total savings / income
- ▶ More income  $\rightarrow$  less deposits / savings and less deposits / income
- ▶ Dashed line shows policy function for less severe expenditure shock

## PUBLIC FIRM

- ▶ Representative firm
- ▶ 'Public' → no agency (information) frictions, access to capital markets
- ▶ Produces in  $t = 3$  according to

$$Y = ZK^{\alpha_1}L^{\alpha_2}, \quad \alpha_1 + \alpha_2 \leq 1$$

- ▶ Pins down the return

$$r^k = \alpha_1 ZK^{\alpha_1-1}L^{\alpha_2}.$$

- ▶  $Z$  subject to shocks after  $K$  and  $L$  chosen

## PRIVATE FIRM

- ▶ In addition to representative public firm, economy is populated by mass of private firms, indexed by  $j$ , endowed with initial 'private capital'  $\tilde{h}_{1,j}$
- ▶ 'Private'  $\rightarrow$  lenders can only verify productivity  $\tilde{Z}_j$  by incurring a cost
- ▶ Take out bank loans at interest rate  $r^l$  to finance capital and labor
- ▶ Production takes place in  $t = 3$ , objective function is

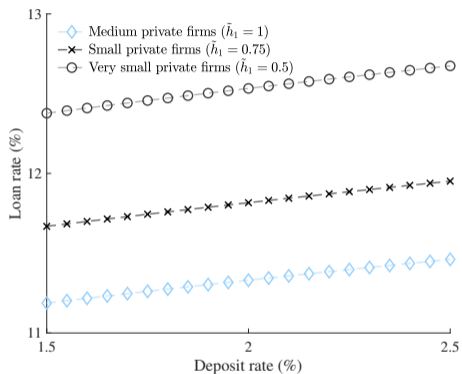
$$\tilde{\Pi}_j = \tilde{Z}_j \tilde{h}_{3,j}^{\theta_1} \tilde{L}_j^{\theta_2} - (1 + r^l)w\tilde{L}_j - (1 + r^l)(\tilde{h}_{3,j} - \tilde{h}_{1,j}) + (1 - \delta)\tilde{h}_{3,j}. \quad (1)$$

$\rightarrow$  optimal  $\tilde{L}$  and  $\tilde{h}_3$  depend negatively on loan rate

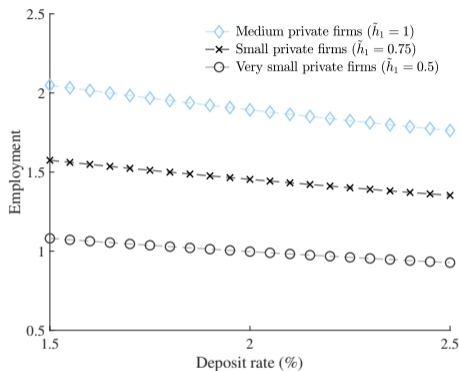
## BANK AND RISKY DEBT CONTRACT

- ▶ Bank operates in perfectly competitive environment
  - ▶ Takes deposits at cost  $r^d$ , makes loans to private firms at rate  $r^l$
  - ▶ Only private firm observes its productivity realization, has incentive to misreport
    - ▶ Bank can audit at cost  $\gamma_a$
    - ▶ Costly-state-verification problem in the spirit of Bernanke and Gertler (1989)
- ⇒ Solution is an optimal risky debt contract
- ▶ Firm-specific contract
  - ▶ Characterized by rate, amount, auditing probability
  - ▶ These are functions of the deposit rate

# CREDIT MARKET EQUILIBRIUM



(A) Optimal loan rate across firm sizes



(B) Optimal employment across firm sizes

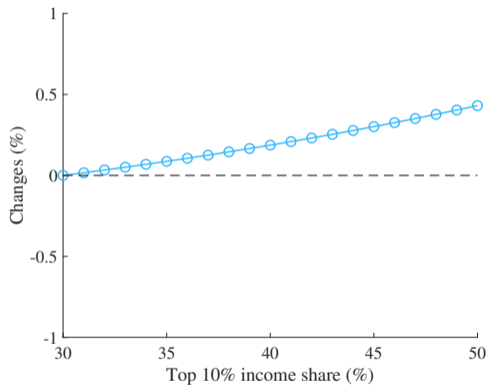
- ▶ Loan contract: optimal loan rate depends positively on deposit rate
- ▶ Private firm: labor choice (loan amount) depends negatively on deposit rate

## GENERAL EQUILIBRIUM EXPERIMENT

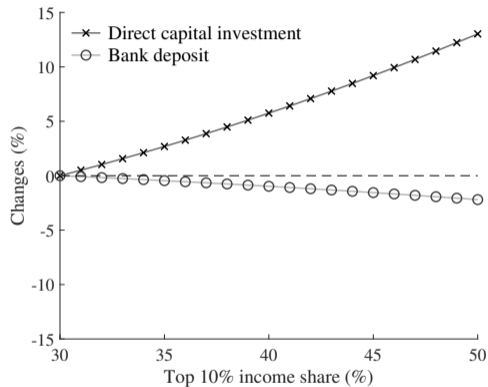
- ▶ Construct variation in top income share
  - ▶ Two household types  $i = L, H$
  - ▶ Mass is  $\mu_L = 0.9, \mu_H = 0.1$
  - ▶ Vary  $y_{L,1}$  and  $y_{H,1}$  such that (i) top 10% share moves from 30% to 50%  
(ii) mean income stays constant
- ▶ Calibrate structural parameters [Details](#)
- ▶ For different levels of the top 10% income share, examine:
  1. Aggregate savings & savings by asset type
  2. Aggregate employment & employment by firm type (public vs. private)
  3. Employment across size distribution of private firms



# GENERAL EQUILIBRIUM EXPERIMENT: SAVINGS

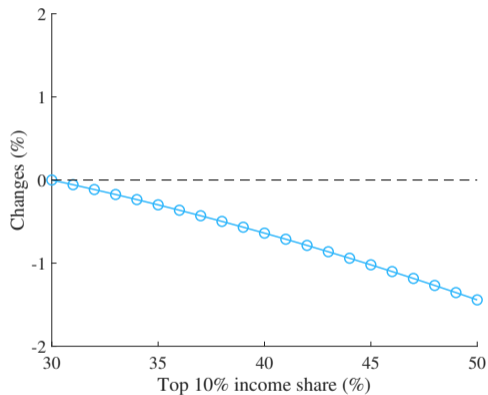


(A) Aggregate savings

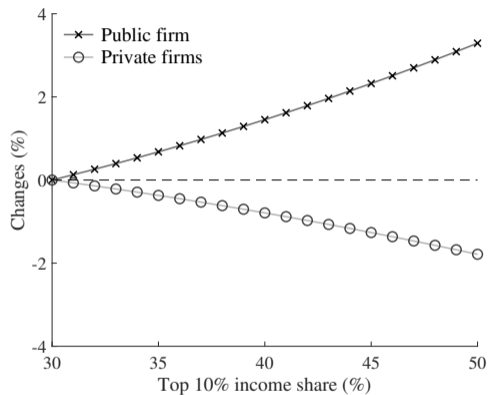


(B) Savings by asset type

# GENERAL EQUILIBRIUM EXPERIMENT: EMPLOYMENT



(C) Aggregate employment



(D) Employment by firm type

## GE EXPERIMENT: JOB CREATION ACROSS FIRM SIZES

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<b>Top 10% income share</b>	<b>30%</b>	<b>50%</b>
Employment in average private firm ( $\tilde{h}_1 = 1$ )	1.87 - 1.78%	1.83
Employment in small private firm ( $\tilde{h}_1 = 0.75$ )	1.43 - 1.80%	1.41
Employment in very small private firm ( $\tilde{h}_1 = 0.5$ )	0.98 - 1.81%	0.97

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## TAKING STOCK OF MODEL INSIGHTS

- ▶ The market for deposits creates link between
  - ▶ Household portfolio allocation in the face of liquidity risk
  - ▶ Credit market with information frictions
- ▶ If top income share  $\uparrow$ 
  - $\Rightarrow$  aggregate savings  $\uparrow$ , deposits  $\downarrow$ , other investments  $\uparrow$
  - $\Rightarrow$  aggregate employment  $\downarrow$ , private firm employment  $\downarrow$ , public firm employment  $\uparrow$
  - $\Rightarrow$  private firm employment  $\Downarrow$  the smaller the firm
- ▶ *Our calibration is work in progress: current dispersion of initial private capital generates relatively compressed dispersion in employment relative to the data*

## CONCLUSION

## CONCLUSION

- ▶ To the best of our knowledge, we provide the first evidence on the effects of rising household top income shares on small businesses job creation
- ▶ Rising top incomes reduce small firms' job creation
- ▶ Empirical evidence and theoretical model suggest that rising top incomes reduce bank deposits and thereby funding for small firms

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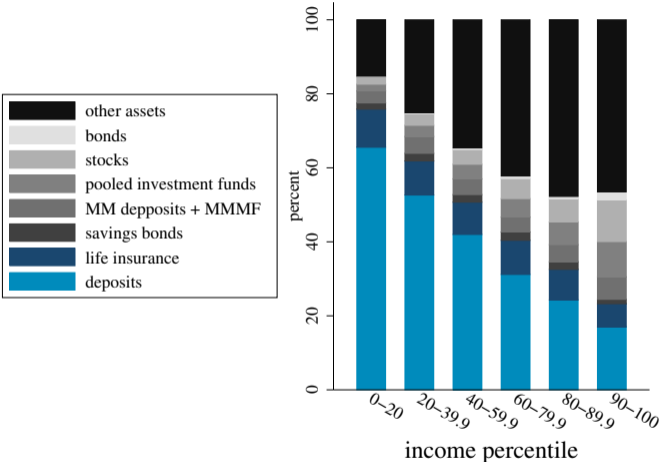
## APPENDIX SLIDES



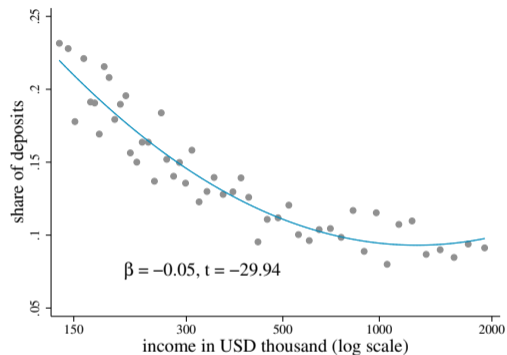
## CONTRIBUTION TO THE LITERATURE

- ▶ Causes of inequality:
  - ▶ See [Gordon and Dew-Becker \(2008\)](#) and [Cowell and Van Kerm \(2015\)](#) for surveys on the causes of rising inequality in the US
- ▶ Consequences of inequality on households:
  - ▶ [Auclert and Rognlie \(2017\)](#), [Auclert and Rognlie \(2020\)](#), [Bertrand and Morse \(2016\)](#), [Coibion, Gorodnichenko, Kudlyak, and Mondragon \(2020\)](#), [Mian, Straub, and Sufi \(2020\)](#)
- ▶ Nexus inequality – production side of economy:
  - ▶ Most papers take cross-country perspective, for example [Banerjee and Duflo \(2003\)](#), [Berg and Ostry \(2017\)](#)
  - ▶ Exception: [Braggion, Dwarkarsing, and Ongena \(2020\)](#) establish negative effect of wealth inequality on entrepreneurship using US micro data

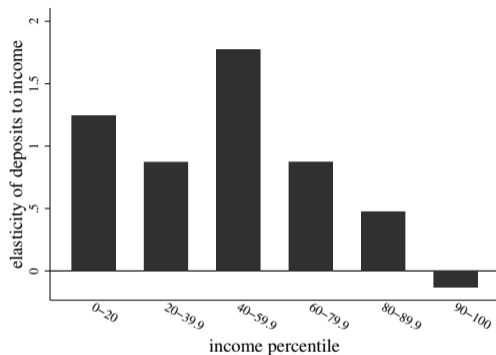
# MORE DETAILED BREAKDOWN OF FINANCIAL ASSETS



## WITHIN TOP 10% AND RESPONSIVENESS



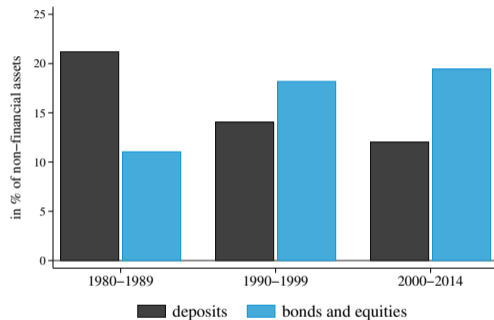
(A) Deposit share by income within top 10%



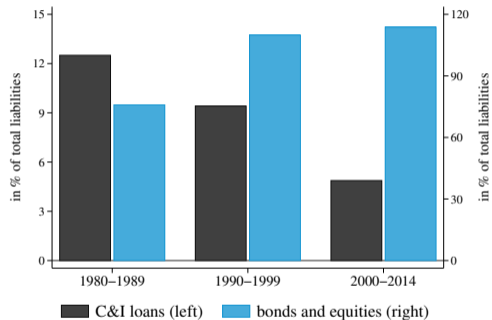
(B) Response deposits ( $\% \Delta$ ) to income ( $\% \Delta$ )

- ▶ Main pattern holds also within top 10% ...
- ▶ ... but deposit amount more responsive for lower income groups

# AGGREGATE PATTERNS 1/2



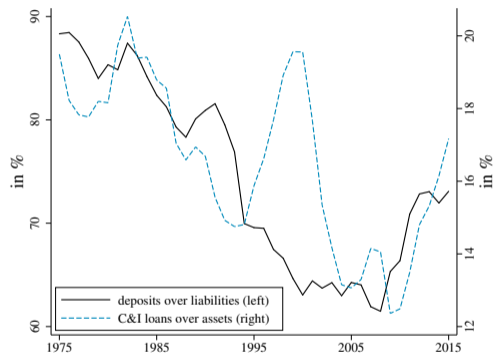
(A) Households



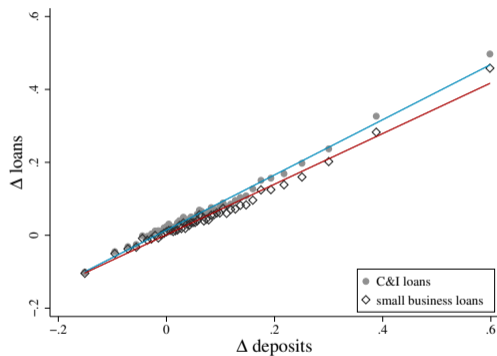
(B) Firms

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## AGGREGATE PATTERNS 2/2



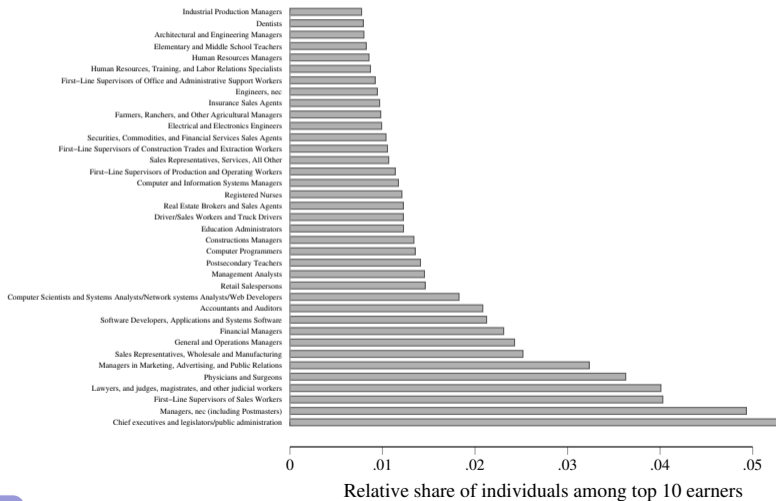
(A) Over time



(B) Cross-section

# WHO ARE THE TOP EARNERS?

SOURCE: IPUMS



## SUMMARY STATISTICS: STATE LEVEL

Variable	Obs	Mean	Std. Dev.	Min	Max	P25	P50	P75
top 10% income share	1598	.405	.053	.252	.609	.368	.403	.436
top 5% income share	1598	.29	.053	.143	.515	.254	.286	.315
top 1% income share	1598	.149	.044	.061	.353	.119	.142	.167
Gini index	1598	.568	.046	.459	.711	.541	.566	.596
net job creation rate, firms 1-9	1598	.023	.041	-.178	.3	.001	.024	.045
net job creation rate, firms 10-99	1598	.019	.032	-.132	.189	.004	.021	.036
net job creation rate, firms 100-249	1598	.024	.036	-.139	.181	.004	.026	.045
net job creation rate total	1598	.018	.027	-.097	.144	.005	.02	.033
income per capita (in th)	1598	27.057	11.717	7.958	69.851	17.371	25.526	35.46
population (in th)	1598	5539.543	6164.385	418.493	38701.28	1332.213	3628.267	6450.632
% old population	1598	.125	.021	.029	.186	.114	.126	.137
% black population	1598	.119	.021	.002	.705	.027	.081	.162
$\Delta$ income p.c.	1598	.047	.031	-.104	.262	.031	.047	.064
unemployment rate	1598	.061	.021	.023	.154	.045	.057	.073

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## SUMMARY STATISTICS: BANK LEVEL

Variable	Obs	Mean	Std. Dev.	Min	Max	P25	P50	P75
log(deposits)	243674	11.093	1.317	0	16.647	10.206	10.966	11.826
deposit expense (in %)	243674	.935	.511	.013	3.254	.547	.931	1.291
log(C&I loans)	112884	9.535	1.712	0	14.787	8.421	9.446	10.575
C&I interest (in %)	112884	2.049	.991	0	22.463	1.469	1.859	2.378
log(assets)	243674	11.437	1.373	6.878	21.423	10.515	11.289	12.163
non-interest income (in %)	243674	10.564	8.172	.327	62.203	5.628	8.679	13.023
return on assets (in %)	243674	2.137	2.6	-13.984	8.015	1.531	2.504	3.353
deposits/liabilities	243674	.946	.085	0	1	.934	.978	.99
capital/liabilities	243424	.1	.044	0	.999	.078	.092	.112

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## MODEL CALIBRATION

Symbol	Description	Value	Symbol	Description	Value
$\beta$	Discount factor	0.99	$Z_L$	Public firm productivity (low)	0
$\sigma$	Risk aversion	3	$P_H$	Prob. of good state (public firm)	0.5
$\mu_H$	Mass of wealthy HHs	0.1	$K_0$	Initial k (public firm)	2
$\mu_L$	Mass of poor HHs	0.9	$\theta_1$	Private firm capital share	0.3
$\lambda_0$	Intercept (liquidity shock)	0.3	$\theta_2$	Private firm labor share	0.65
$\lambda_1$	Slope (liquidity shock)	0.7	$\tilde{\delta}$	Private firm h depreciation	0.0278
$w$	Real wage	0.4	$\tilde{Z}_H$	Private firm productivity (High)	2.2
$\mu$	Mass of the public firm	0.547	$\tilde{Z}_L$	Private firm productivity (low)	0.2
$\tilde{\mu}$	Mass of the private firms	0.453	$\tilde{P}_H$	Prob. of good state (private firm)	0.5
$\alpha_1$	Public firm capital share	0.7	$\underline{h}$	Min initial capital (private firm)	0.5
$\alpha_2$	Public firm labor share	0.3	$\bar{h}$	Max initial capital (private firm)	1.5
$\delta$	Public firm K depreciation	0	$\gamma_A$	Auditing cost	0.1
$Z_H$	Public firm productivity (high)	0.4525			

# DETAILS ON ROBUSTNESS CHECKS

VARIABLES	(1) no crisis net JCR	(2) no GFC net JCR	(3) no VC net JCR	(4) net JCR	(5) edu sample net JCR	(6) edu sample net JCR	(7) net JCR	(8) net JCR	(9) tradable net JCR	(10) no FiUt net JCR	(11) net JCR	(12) net JCR
top 10% × very small firm (1-9)	-0.334*** (0.028)	-0.318*** (0.028)	-0.341*** (0.029)	-0.281*** (0.047)	-0.422*** (0.041)	-0.658*** (0.074)	0.182*** (0.055)	-0.424*** (0.029)	-0.586*** (0.034)	-0.465*** (0.028)	-0.389*** (0.028)	-0.364*** (0.027)
Gini × very small firm (1-9)				-0.059 (0.053)								
education exp. × very small firm (1-9)						0.020*** (0.005)						
bank dep. × very small firm (1-9)							0.837*** (0.073)					
top 10% × bank dep. × very small firm (1-9)							-2.020*** (0.183)					
ext. fin. dep. × very small firm (1-9)								0.048*** (0.009)				
top 10% × ext. fin. dep. × very small firm (1-9)								-0.112*** (0.021)				
markup × very small firm (1-9)											0.009*** (0.001)	
HHL × very small firm (1-9)												0.037*** (0.008)
Observations	14,800	15,510	15,050	16,450	10,120	10,120	298,759	298,759	246,978	268,700	267,343	267,343
State*Size FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
State*Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
State*Naics*Year FE	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓
Cluster	State	State	State	State	State	State	State	State	State	State	State	State
F-stat	285.37	298.38	279.54	302.06	324.54	324.54	332.20	331.75	333.06	303.53	307.10	307.10

## DIFFERENT OUTCOME VARIABLES

VARIABLES	(1) log(firms)	(2) log(jc)	(3) log(jc births)	(4) log(jc cont)	(5) log(jd)	(6) jcr	(7) jcr births	(8) jdr	(9) net jcr	(10) real. rate
top 10% × very small firm (1-9)	-2.443*** (0.198)	-3.517*** (0.297)	-2.447*** (0.269)	-3.706*** (0.311)	-2.512*** (0.270)	-0.405*** (0.027)	-0.312*** (0.023)	-0.061*** (0.012)	-0.338*** (0.028)	-0.334*** (0.030)
Observations	16,450	16,450	16,450	16,450	16,450	16,450	16,450	16,450	16,450	16,450
State*Size FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
State*Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cluster	State	State	State	State	State	State	State	State	State	State

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## CALL REPORTS – BANK SIZE

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	log(dep)	dep rate	log(CI)	CI rate	state-level net JCR	state-level net JCR
top 10% income share	-13.331*** (0.919)	-12.971*** (0.827)	-20.017*** (2.459)	-43.645*** (3.523)		
top 10% × log(assets)	1.352*** (0.033)	1.269*** (0.038)	1.783*** (0.087)	4.175*** (0.138)		
top 10% × very small firm (1-9)					0.569 (0.429)	-0.459*** (0.045)
very small firm (1-9) × log(median assets)					0.043** (0.018)	
top 10% × very small firm (1-9) × log(median assets)					-0.089** (0.040)	
very small firm (1-9) × log(banks pc)						-1.016*** (0.185)
top 10% × very small firm (1-9) × log(banks pc)						2.692*** (0.568)
Observations	242,651	242,651	112,393	112,393	16,100	16,100
Bank FE	✓	✓	✓	✓	-	-
Year FE	✓	✓	✓	✓	-	-
State*Size FE	-	-	-	-	✓	✓
State*Year FE	-	-	-	-	✓	✓
Cluster	State	State	State	State	State	State
F-stat	25.02	25.02	88.23	88.23	302.06	302.06