Income Inequality, Financial Intermediation, and Small Firms

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MOTIVATION

- US top 10% income share increased from around 30% in 1970 to 50% today
  - **Causes?** globalization, skill-biased technical change, superstar firms, taxation, ...
  - **Consequences?** voting behavior, household consumption and indebtedness, ...
- Little insight on consequences of household income inequality for firms

THIS PAPER

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- Propose and test novel economic mechanism
  - Motivating observations:
    1. Higher income earners hold relatively fewer bank deposits, more stocks, bonds, etc.
    2. Small firms bank-dependent, banks' access to deposits affects ability to fund them

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    2. Small firms bank-dependent, banks' access to deposits affects ability to fund them
  - Hypothesis:
    - If relatively more income accrues to top earners ...
    - ... fewer savings flow into deposits ...
    - ... which negatively affects bank lending ...
    - ... suppressing job creation of small firms relative to large firms

STRATEGY OF THIS PAPER

1. Motivating observations $\rightarrow$ hypothesize mechanism

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2. Empirical analysis → test mechanism
   - Exploit variation in top income shares across US states from 1980 to 2015
   - Main 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)
   - Test mechanism: bank-level regressions, industry-heterogeneity, ...

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   - Test mechanism: bank-level regressions, industry-heterogeneity, ...
3. Structural model → quantitative experiments
   - Heterogeneous households (portfolio choice) + heterogeneous firms (fin. frictions)
   - Study consequences of higher income inequality on employment, output, welfare
   - Assess the contribution of our mechanism to these consequences

PREVIEW OF 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:
  - Effect is declining in firm size, stronger in industries with higher bank dependence
  - Higher top income shares in headquarter state reduce deposits, rise interest expenses, reduce C&I loans, increase interest income
- Quantitative model experiments:
  - Higher top income share lead to stronger employment concentration in large firms
  - Shutting off portfolio heterogeneity leads to underestimation of average welfare reduction, overestimation of positive aggregate employment and output effects

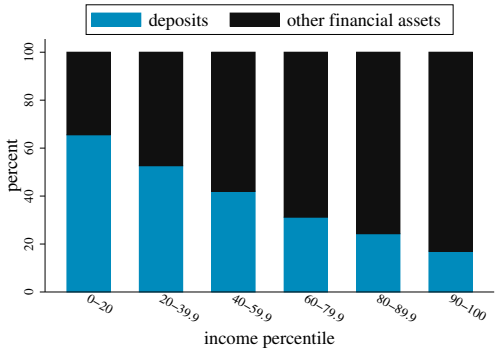
STRUCTURE OF THE PRESENTATION

1. Motivating observations and proposed channel
2. Empirical analysis
3. Structural model $\rightarrow$ *new version, work in progress!*
4. Conclusion

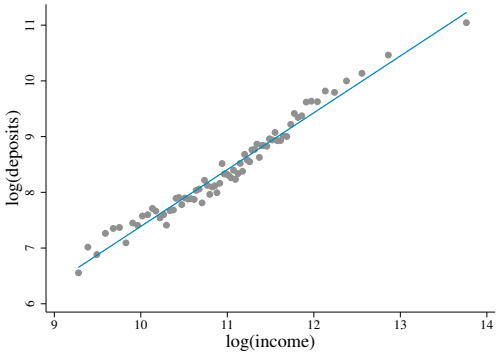
MOTIVATING OBSERVATIONS AND PROPOSED CHANNEL

HOUSEHOLD INCOME AND FINANCIAL ASSET ALLOCATION

SOURCE: SURVEY OF CONSUMER FINANCES



(A) Deposit shares across income groups



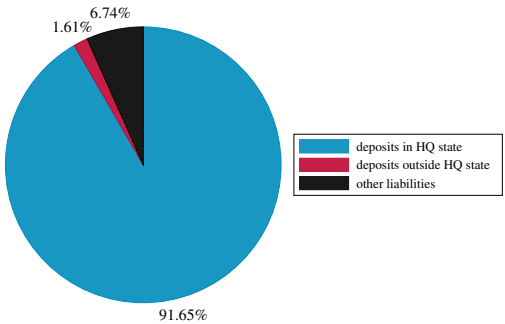
(B) Absolute deposit holdings by income

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

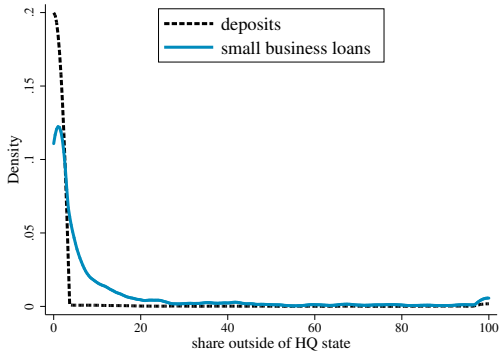
More SCF patterns

DEPOSITS AND SMALL BUSINESS LOANS

SOURCE: FEDERAL DEPOSIT INSURANCE CORPORATION



(C) Deposits held inside banks' HQ state



(D) Distribution

- Deposits in headquarter state are 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
  - Banks' access to deposits affects their ability to grant loans:
    Ivashina and Scharfstein (2010), Gilje, Loutskina, and Strahan (2016), Drechsler, Savov, and Schnabl (2017)
- Importance of bank funding for small firms
  - Banks have a comparative advantage in screening and monitoring borrowers
  - Small firms more affected by changes in credit supply than large firms:
    Becker and Ivashina (2014), Chodorow-Reich (2014), Liberti and Petersen (2019)

- Taking stock:
  - Low-income households hold relatively more, but absolutely fewer deposits
  - Banks' access to deposits affects ability to fund small firms
- Based on observations, hypothesis:

  As top incomes shares rise, a relatively smaller share of total financial savings is intermediated via banks. This leads to a relative decline in financing for small firms. In turn, small firms create fewer jobs thank large firms.

Aggregate patterns

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
  - Merged sample: 19,176 state-firm size-year obs for 47 states from 1981 to 2015
- Call Reports: bank-level income statement and balance sheet data

Summary stats

EMPIRICAL STRATEGY: BASELINE SPECIFICATION

$$njc_{s,f,t} = \beta_1\ top\ 10\%_{s,t-1} + \beta_2\ very\ small\ firm_f + \beta_3\ top\ 10\%\ \times very\ small\ firm_{s,f,t-1} + ctrls_{s,t-1} + \theta_{s,f} + \tau_{s,t} + \epsilon_{s,f,t}$$

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

IDENTIFICATION STRATEGY

- Include state*time FE to absorb a range of omitted variables
  - Globalization, skill-biased technical change, ...
- Reserve causality would need to occur within state-firm size-year cells
  - Lag top income share by one year and interact controls with 'very small firm' dummy
  - Members of the top 10% are not only CEOs, but physicians, lawyers, ... Occupations
- In addition, Bartik IV approach ('leave one out') Illustration
  - 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

MAIN RESULTS

VARIABLES	(1) net JCR	(2) net JCR	(3) net JCR	(4) net JCR	(5) IV net JCR	(6) IV net JCR	(7) IV net JCR	(8) IV net JCR
top 10% income share	0.025				-0.114			
	(0.019)				(0.200)			
very small firm (1-9)	0.073***	0.073***	0.091***		0.110***	0.110***	0.133***	
	(0.008)	(0.008)	(0.018)		(0.010)	(0.010)	(0.022)	
top 10% × very small firm (1-9)	-0.162***	-0.162***	-0.122***	-0.150***	-0.253***	-0.253***	-0.225***	-0.309***
	(0.020)	(0.020)	(0.018)	(0.030)	(0.026)	(0.026)	(0.027)	(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

- Top 10% share up by 10pp $\Rightarrow$ relative decline in net JCR by small firms $\approx 1.5pp$
- IV estimates larger

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***			-0.490***	-0.493***	-0.367***	-0.752***
	(0.032)			(0.031)	(0.030)	(0.029)	(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:

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

- Allow for state*industry*time fixed effects ($\tau_{s,i,t}$)

- Effects 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

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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:

$$y_{b,t} = \delta \; top\; 10\%\; income\; share_{s,t-1} + controls_{b,t-1} + controls_{s,t-1} + \theta_b + \tau_t + \epsilon_{b,t}.$$

- $y_{b,t}$: 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 (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***			2.652***			-2.405***	11.655**
	(0.576)			(0.645)			(0.657)	(4.843)
top 5% income share		-2.652***			2.912***			
		(0.764)			(0.800)			
top 1% income share			-4.928***			2.942***		
			(1.134)			(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, include house price growth, exclude states with high VC activity, exclude non-tradable industries, control for industry concentration ... details

STRUCTURAL MODEL

PURPOSE OF THE MODEL

1. Formalize our mechanism in a tractable framework
   - Incorporate general equilibrium feedback effects

2. Quantitative experiments that analyze rising top income share
   - Study consequences for aggregate employment and aggregate output
   - Study consequences for labor share and employment concentration
   - Study consequences for welfare along the income distribution
   - Assess the contribution of our channel to these consequences

new version, work in progress!

MODEL SETUP

- Infinite horizon economy
- Agents:
  - Heterogeneous households
  - Representative 'public' firm
    - Access to frictionless capital market
  - Heterogeneous 'private' firms
    - Bank-dependent, working capital constraint
  - Representative bank

HOUSEHOLDS

- Two groups (L and H), indexed by $i \in \{L, H\}$ with mass μ_i
- Differ in productivity process $s_{i,t}$
  - Calibrate income process parameters to generate income inequality
- Consume, save, supply labor to two types of firms
- Savings can be allocated to
  1. Direct capital investment: pays R^k
  2. Deposits: pay R^d, give utility (liquidity services)
- Returns and wages are taken as given

HOUSEHOLDS

- In many macro models, savings shares constant in income (see Straub, 2019)
- Generate a decreasing deposit share by specifying

$$u(c_i, l_{i,l}) + v(d_i) = \frac{\bar{u}(c_i, l_{i,l})^{1-\sigma}}{1-\sigma} + \psi_d \frac{d_i^{1-\eta}}{1-\eta}$$

- Where

$$\bar{u}(c_i, l_{i,l}) = c_i - \sum_{l=1}^{2} \psi_l \frac{l_{i,l}^{1+\frac{1}{\nu}}}{1+\frac{1}{\nu}} \quad , \quad \eta > \sigma$$

- Nonhomotheticity in household preferences: deposits are *necessity good*
- Captures e.g. liquidity services disproportionately important for low-income HHs

Full HH problem

PUBLIC FIRMS

- Representative firm
- 'Public' $\rightarrow$ frictionless access to capital markets
- Produces according to

$$Y_t = Z_t K_t^{\theta} N_t^{1-\theta}$$

- Pins down return for household and wage for public firm employment

$$\begin{aligned} R_t^k &= \theta Z_t K_t^{\theta-1} N_t^{1-\theta} + 1 - \delta \\ W_{1,t} &= (1-\theta) Z_t K_t^{\theta} N_t^{-\theta} \end{aligned}$$

PRIVATE FIRMS

- Economy is populated by mass of private firms, indexed by j
- 'Private' $\rightarrow$ cannot access public capital markets
- Solve the following static problem

$$\max_{n_{j,t}} z_{j,t} n_{j,t}^{\alpha} - \{1 + (R_t^l - 1)\phi_j\} w_{2,t} n_{j,t}$$

where ϕ_j is the fraction of the wage bill covered through a bank loan

- Solution is given by

$$n_{j,t}^{*} = \left[\frac{\alpha z_{j,t}}{\{1 + (R_t^l - 1)\phi_j\} w_{2,t}} \right]^{\frac{1}{1-\alpha}}$$

- Setting allows us to derive various analytical results

$\frac{\partial n^*_{j,t}}{\partial \phi_j} < 0$: more financially constrained firms are smaller

$\frac{\partial n^*_{j,t}}{\partial z_{j,t}} > 0$: more productive firms are larger

$\frac{\partial n^*_{j,t}}{\partial R^l_t} < 0$: higher loans rates reduce employment

$\frac{\partial n^*_{j,t}}{\partial R^l_t \partial \phi_j} < 0$: higher loans rates reduce employment more for more constrained

(holding wages constant)

BANK

- Representative bank takes deposits from households, makes loans to private firms
- Assume that the bank pays a fixed cost to intermediate funds
- The zero profit condition is given by

$$R_t^d D_t + \Xi = R_t^l L_t$$

  where $D_t = \int_i d_{i,t}$ and $L_t = \int_j \phi_j \; w_t n_{j,t}$

- Implies the following relationship between the loan rate and deposit rate

$$R_t^l = R_t^d + \frac{\Xi}{D_t}$$

CALIBRATION OF KEY FIRM PARAMETERS

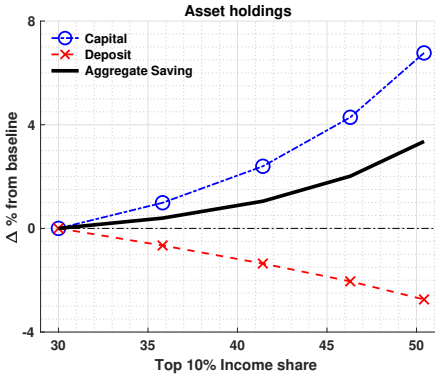
Parameter	Target	Value	Model	Targets/Data
Z	SS real wage	1.1399	1.00	1.00
z_1	Private firm employment share	1.2365	0.531	0.531
z_2	Relative size of employment	1.2446	11	11
z_3		1.3429	60	60
ϕ_1	Column 2 in Table 3	0.7665	-0.358	-0.360
ϕ_2		0.3782	-0.061	-0.066
ϕ_3		0.3499	-0.036	-0.042
μ_1	Relative share of employment	0.8409	0.137	0.137
μ_2		0.1456	0.261	0.261
μ_3		0.0135	0.132	0.132

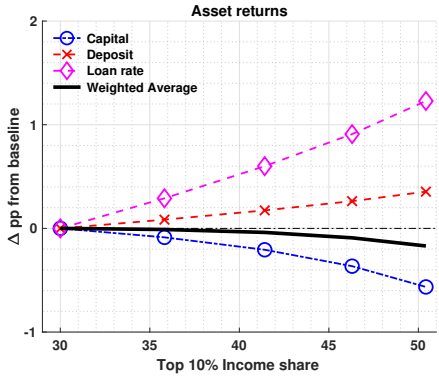
HH and bank calibration

GENERAL EQUILIBRIUM EXPERIMENT

- G.E. experiment: vary top 10% income share from 30% to 50%
  - Preserve mean income level prior to GE responses
  - Income includes capital income, labor income and transfers
  - Achieve this by using net zero transfers T_i

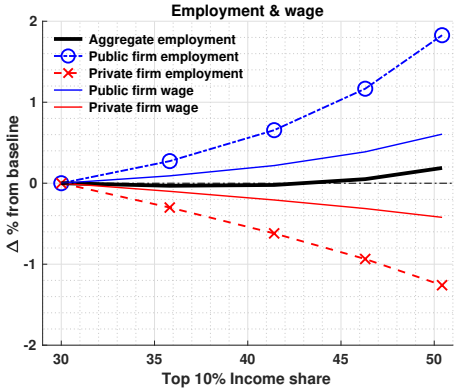
GENERAL EQUILIBRIUM EXPERIMENT: SAVINGS AND RETURNS

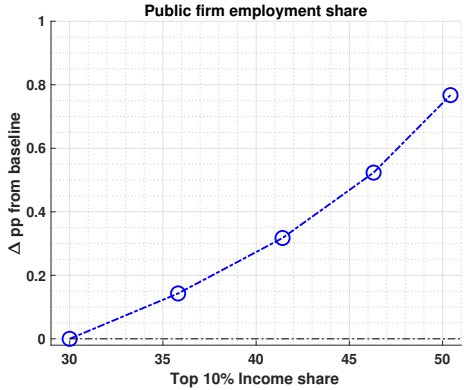




- Deposit and loan amount/rate responses in line with bank-level empirical results

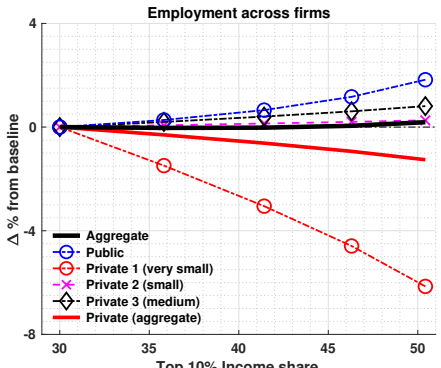
GENERAL EQUILIBRIUM EXPERIMENT: EMPLOYMENT





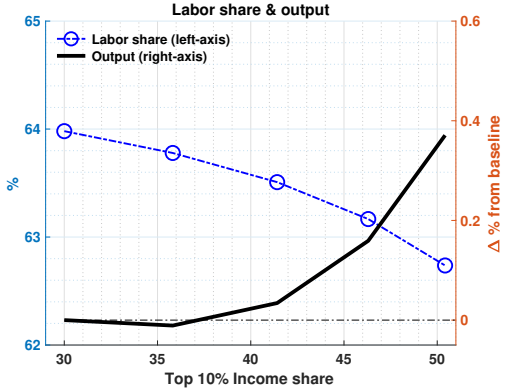
- Rising inequality causes labor market concentration towards large firms
- Limited effects of aggregate employment
- Public firm employment share increases by 0.8pp (16% of 4.9pp in the data)

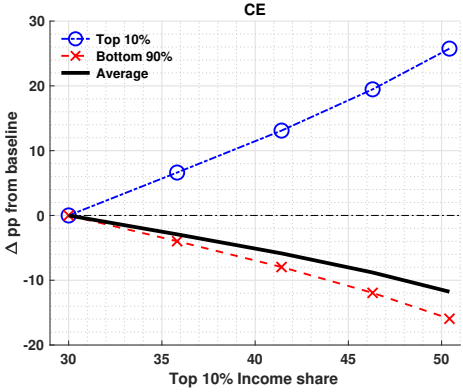
GE EXPERIMENT: CHANGE IN JOB CREATION ACROSS FIRM SIZES



- Smallest (most constrained) firms experience biggest decline in employment from tighter loan supply
- Relatively larger (less constrained) private firms' employment rises because of a fall in real wage
  - Recall that wage was fixed in private firm comparative statics

GE EXPERIMENT: AGGREGATE CONSEQUENCES



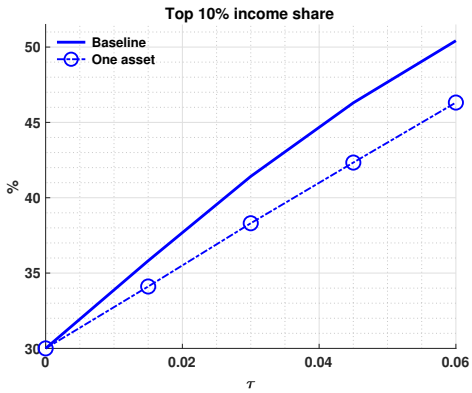


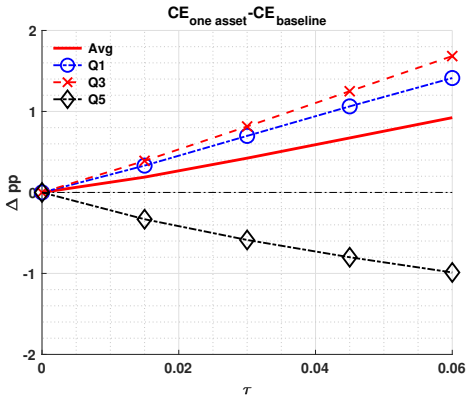
- Rise in inequality leads to a minor increase in output and a fall in the labor share
- Average welfare decreases, with gains for top 10% and losses for bottom 90 %

GE EXPERIMENT: CONTRIBUTION OF OUR MECHANISM

- Assess how the consequences of higher income inequality are affected by the presence of our channel
- Compare experiments to those in a model with fixed portfolio composition
  - Return on saving is weighted average return on deposit and capital
  - Same aggregate deposit share across two models
  - Achieve this by re-calibrating β and C_H

GE EXPERIMENT: CONTRIBUTION OF OUR MECHANISM





- Muting the portfolio heterogeneity channel leads to an underestimation of the negative effects of higher top income shares on average welfare

CONCLUSION

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- To the best of our knowledge, we provide the first evidence on the effects of rising household top income shares on job creation at firms of different sizes
- Rising top incomes reduce small firms' job creation through the portfolio allocation of households
- Quantitative experiments suggest the mechanism affects the conclusions that can be drawn about the effects of inequality on the aggregate economy and welfare

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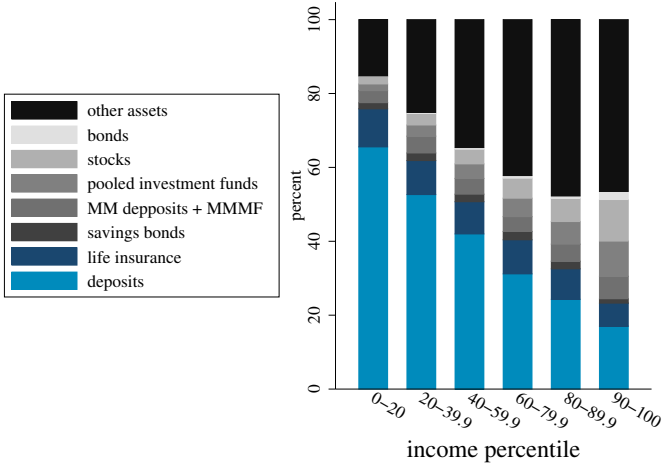
APPENDIX SLIDES

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



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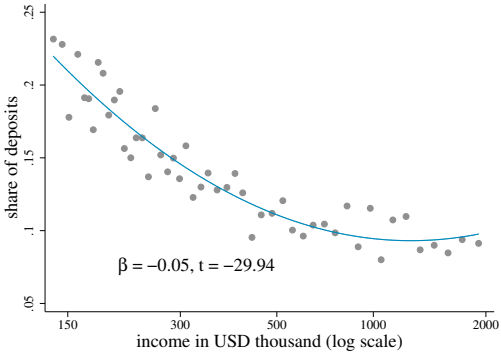
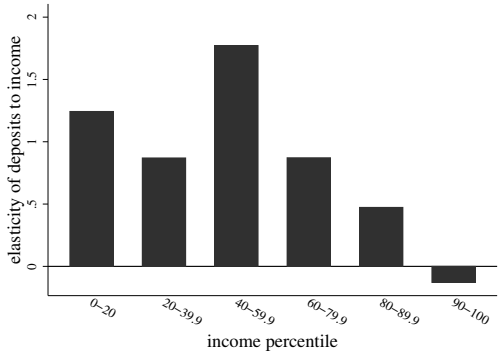
WITHING TOP 10% AND RESPONSIVENESS



(A) Deposit share by income within top 10%



(B) Response deposits (%Δ) to income (%Δ)

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

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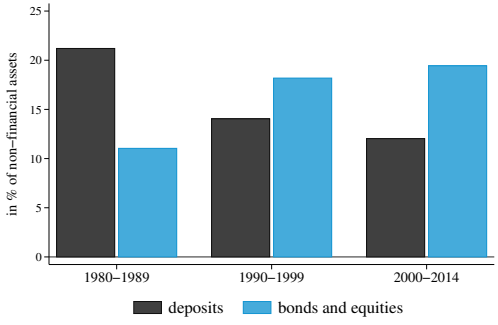
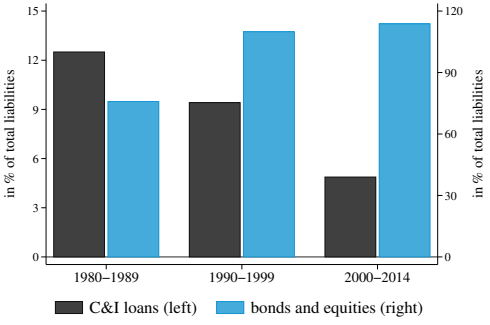
AGGREGATE PATTERNS 1/2



(A) Households



(B) Firms

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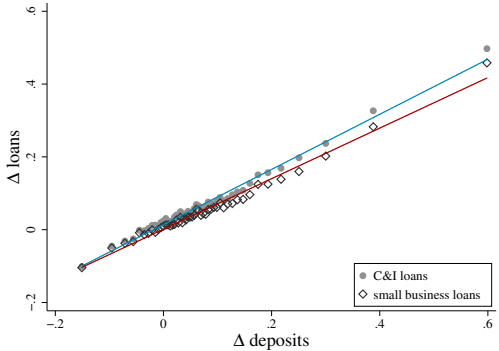
AGGREGATE PATTERNS 2/2



(A) Cross-section

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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	.121	.002	.705	.027	.081	.162
Δ 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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WHO ARE THE TOP EARNERS?

SOURCE: IPUMS

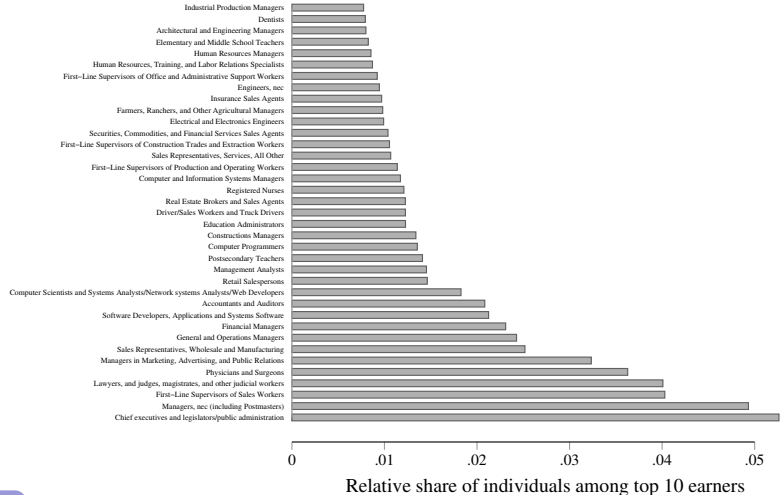

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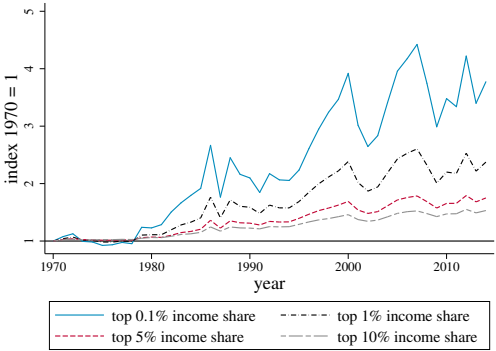
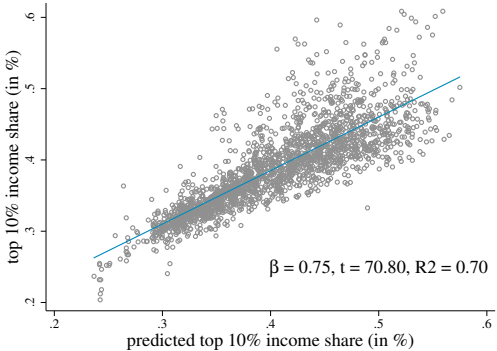
ILLUSTRATION OF BARTIK IV



(A) Aggregate trends



(B) First stage correlation

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ROBUSTNESS CHECKS: STATE-YEAR LEVEL

VARIABLES	(1) no recession net JCR	(2) no GFC net JCR	(3) pre 2008 net JCR	(4) no VC net JCR	(5) net JCR	(6) net JCR	(7) edu sample net JCR	(8) edu sample net JCR
top 10% × very small firm (1-9)	-0.334***	-0.318***	-0.271***	-0.341***	-0.468***	-0.440***	-0.422***	-0.658***
	(0.028)	(0.028)	(0.033)	(0.029)	(0.042)	(0.042)	(0.041)	(0.074)
log(VC amt) × very small firm (1-9)					-0.000			
					(0.000)			
log(VC deals) × very small firm (1-9)						-0.005***		
						(0.001)		
education exp. × very small firm (1-9)								0.020***
								(0.005)
Observations	14,800	15,510	12,690	15,050	9,450	9,450	10,120	10,120
State*Size FE	✓	✓	✓	✓	✓	✓	✓	✓
State*Year FE	✓	✓	✓	✓	✓	✓	✓	✓
State*Naics*Year FE	-	-	-	-	-	-	-	-
Cluster	State	State	State	State	State	State	State	State
F-stat	-	-	-	-	-	-	-	-

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ROBUSTNESS CHECKS: STATE-INDUSTRY-YEAR LEVEL

VARIABLES	(1) net JCR	(2) net JCR	(3) tradable net JCR	(4) no FiUt net JCR	(5) net JCR	(6) net JCR
top 10% × very small firm (1-9)	0.182***	-0.424***	-0.586***	-0.465***	-0.389***	-0.364***
	(0.055)	(0.029)	(0.034)	(0.028)	(0.028)	(0.027)
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)	
HHI × very small firm (1-9)						0.037***
						(0.008)
Observations	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
F-stat	332.20	331.75	333.06	303.53	307.10	307.10

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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***	-3.517***	-2.447***	-3.706***	-2.512***	-0.405***	-0.312***	-0.061***	-0.338***	-0.334***
	(0.198)	(0.297)	(0.269)	(0.311)	(0.270)	(0.027)	(0.023)	(0.012)	(0.028)	(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) log(dep)	(2) dep rate	(3) log(CI)	(4) CI rate	(5) state-level net JCR	(6) state-level net JCR
top 10% income share	-13.331***	-12.971***	-20.017***	-43.645***		
	(0.919)	(0.827)	(2.459)	(3.523)		
top 10% × log(assets)	1.352***	1.269***	1.783***	4.175***		
	(0.033)	(0.038)	(0.087)	(0.138)		
top 10% × very small firm (1-9)					0.569	-0.459***
					(0.429)	(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

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FULL HOUSEHOLD PROBLEM

$$V(k_i, d_i) = \max_{c_i, l_{i,l}, k_i', d_i'} u(c_i, l_{i,l}) + v(d_i) + \beta \mathbb{E}\Big[V(k_i', d_i')\Big]$$

subject to

$$c_i + k_i' + d_i' = \sum_{l=1}^{2} w_l s_i l_{i,l} + R^k k_i + R^d d_i + \Pi_i - T_i$$

$$d_i, k_i \geq 0$$

where

$$s_i = C_i \xi_i \ , \ \log(\xi_i) = \rho \log(\xi_{i,-1}) + \epsilon_i \ , \ \epsilon_i \ \sim N(0, \sigma_i^2)$$

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CALIBRATION: EXTERNAL

Parameter	Description	Value
σ	Relative risk aversion	1.50
ν	Frisch elasticity	3
ρ	Autocorrelation of income process	0.92
σ_L	Std dev of income process (L)	0.10
σ_H	Std dev of income process (H)	0.12
α	Private firm production function	0.95
μ_L	Mass of L type HHs	0.9
μ_H	Mass of H type HHs	0.1

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CALIBRATION: INTERNAL

Parameter	Target	Value	Model	Targets/Data
Households				
ψ_d	Deposit share of middle quintile	0.0176	0.45	0.45
η	Top 10% deposit share	2.1900	0.22	0.22
C_H	Top 10% income share	3.5041	0.30	0.30
C_L	Normalization	1	-	-
β	Return on capital	0.9147	1.08	1.08
Bank				
Ξ	Fraction of reserve	0.1025	0.09	0.10

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