Do SBA Loans Create Jobs?

Estimates from Universal Firm-Level Panel Data and Longitudinal Matching Methods

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Disclaimers

Any opinions and conclusions expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Census Bureau. All results have been reviewed to ensure that no confidential information on individual firms is disclosed.

However, the results in this presentation are still confidential and preliminary; please comment but do not quote.

We thank the SBA for providing us with the loan recipient data.

Main Question

- Do credit constraints hinder small firm growth?
  - Small Business Administration (SBA) loan programs focus on credit-constrained firms

Do small business loans create jobs?

- Conceptually ambiguous:
  - Reduce cost of capital -> expansion
  - Ameliorate credit rationing
  - But: substitution, displacement, leaky bucket effects
  - K-L substitution

Do small business loans create jobs?

- Empirically difficult (absent an experiment):
  - Many growth factors
    - industry
    - region
    - size
    - age…
  - Selection bias – loan could reflect growth potential
    - positive or negative
  - Measuring displacement – general equilibrium
- Many firm growth studies
- But no rigorous evaluations of loan policies

How do Loan Effects Vary with the Business Cycle?

- Firms are more credit constrained in recessions
- Opportunities for growth more limited in recessions

How do Loan Effects Vary by Age and Size?

- Haltiwanger, Jarmin, and Miranda (2012) suggest firm age is more important determinant of job creation than size
- Young and small firms more likely to be credit constrained
  - Young and small firms have higher exit rates
  - Young firms have shorter credit history
  - Young firms have less time to build up retained earnings
  - Small firms have fewer assets to pledge
  - Fixed costs of financing make it more expensive for small firms

SBA Loans

- 7(a) program
  - Loans made by commercial lenders
  - SBA provides guaranty of certain percentage of loan amount (usually 50-85%)
  - Loan maximum of $2,000,000
  - Loan guaranty maximum of $1,500,000
  - Median loan size $90,000

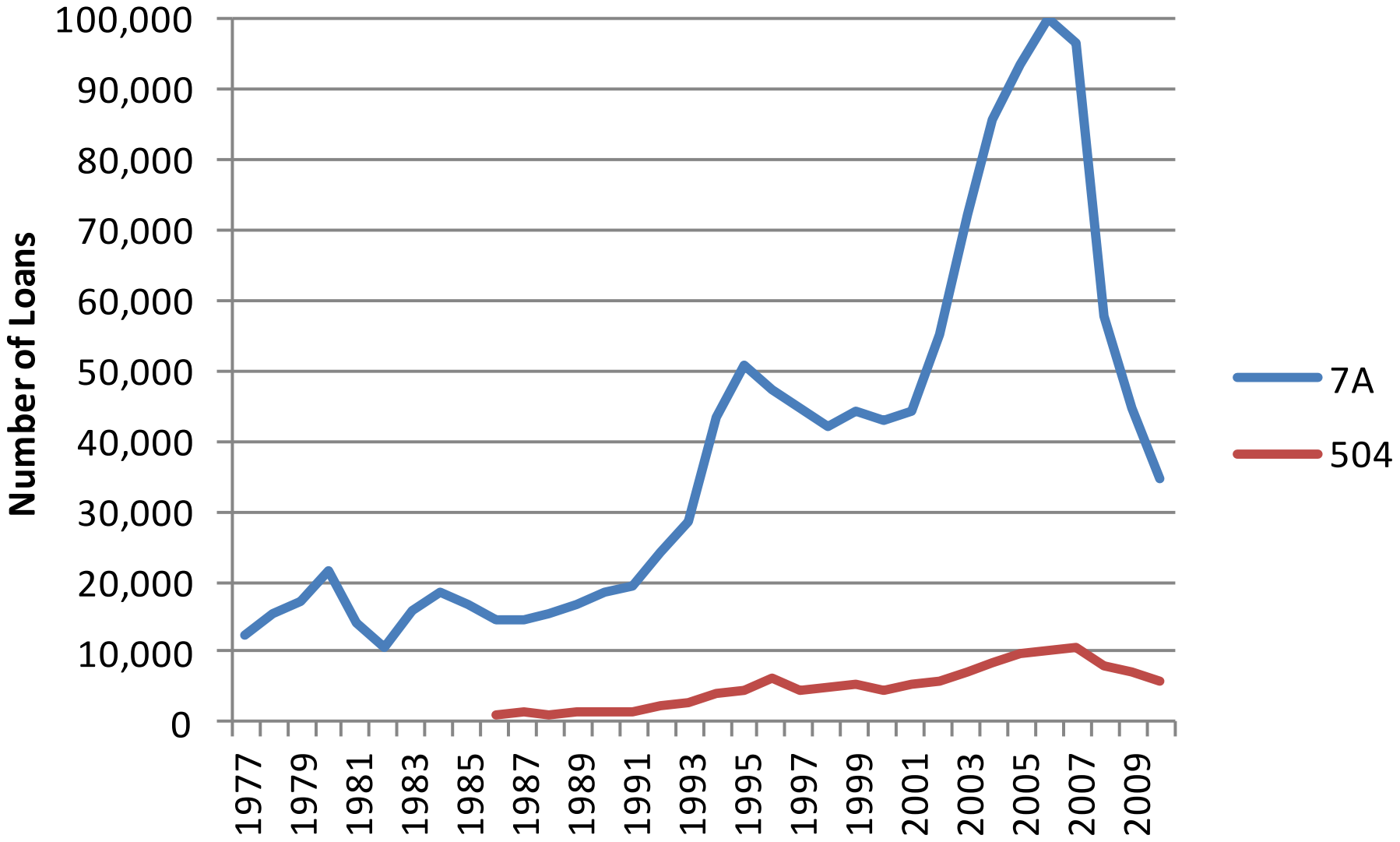
SBA Loans

- 504 program
  - Loan from private-sector lender covering up to 50% of project cost
  - Loan from Certified Development Company (CDC), backed 100% by SBA, covering up to 40% of cost
  - Contribution of at least 10% equity from recipient
  - CDC loan subordinate to private-sector lender loan
  - Median loan size $342,000

SBA Loans

- Lender must sign statement “Without the participation of SBA to the extent applied for we would not be willing to make this loan, and in our opinion the financial assistance applied for is not otherwise available on reasonable terms.”

SBA Loans by Year



Data

- List of all SBA 7A and 504 loan recipients, 1953-2010 (estimate effects for 1977-2008 recipients)
- Longitudinal Business Database (LBD)
  - Annual data on universe of all non-farm, non-public administration business establishments with paid employees, 1976-2009
  - Limited variables, employment as of March 12
- Probabilistic Matching on Name, Address, Zip Code
- Focus on single-establishment firms

SBA Recipient Match Rate to Census Data

	Not Matched to LBD	Matched to LBD	In Regressions
Number of Firms	777,578	549,094	334,039
Percent of All SBA	58.6%	41.4%	25.2%

Sample Comparisons

	Not Matched to LBD	Matched to LBD	In Regressions
Percent 7A Loans	92.1%	90.8%	90.7%
Percent New Firms	31.9%	25.2%	23.6%
Percent Sole Proprietorships	32.7%	23.2%	21.6%
Percent Partnerships	5.8%	4.9%	4.5%
Percent Minority	29.1%	22.6%	25.9%
Percent Female	30.3%	27.7%	28.6%
Percent Veteran	11.4%	12.1%	11.2%
Mean Employment	11.3	12.7	12.4

Sample Comparisons: Sector

	Not Matched to LBD	Matched to LBD	In Regressions
Percent Construction	5.8%	6.4%	7.5%
Percent Manufacturing	6.7%	6.6%	5.3%
Percent Wholesale Trade	4.7%	4.3%	4.4%
Percent Retail Trade	13.6%	11.8%	11.2%
Percent Finance/Insurance /Real Estate	2.5%	1.8%	2.1%
Percent Services	33.4%	29.7%	33.5%
Percent Other/Unknown	33.3%	37.4%	36.0%

Econometric issues - overview

- Define Y_{it}^1 = outcome if treated, Y_{it}^0 if not
  - L_i=1 in treatment group, = 0 for non-treatment
  - ATT = $E(Y_{it}^1 | L_i=1) - E(Y_{it}^0 | L_i=1)$
- Problem: $E(Y_{it}^0 | L_i=1)$ unobserved
  - $E(Y_{it}^0 | L_i=1) \neq E(Y_{it}^0 | L_i=0)$ => matching on observables
  - Selection on unobservables => DiD regression:

    $$Y_{ijt} = \alpha_i + \alpha_t + \beta_1 L_i + \beta_2 \text{Loantiming}_{it} + \beta_3 L_i * \text{Post}_t + u_{it}$$

  - Loantiming_{it} = 0 in treated firm's treatment year, u = other factors
  - $E(L_i u_{it}) \neq 0$ => include establishment FE
  - Identifying assumption: $E(L_i * \text{Post}_t * u_{it}) \neq 0$ –

    No systematically time-varying selection of firms into loan program

Estimation method (ATT)

- Matching -> construct control group from universal panel data (LBD)
- Panel DiD regressions with matched samples, 1976-2009
- Pre- and post-dynamics of the effect
  - Pre-loan: diagnose selection bias (“pseudo-outcomes”)
  - Post-loan: short- versus long-term effects

Matching details

- Exclude establishments that ever receive SBA 7A, 504, or disaster loan from control group
- Focus on first SBA loan for treated group
- Exact match on loan year, 4-digit industry, county, age category (0, 1-2, 3-5, 6-10, >10), and previous year employment (+/- 10%)
- Propensity score matching
  - Lagged outcomes(to *t*-4), wage, exact age
  - Common support
  - 0.9 – 1.1 bandwidth
  - Kernel weights

Specification Checks

- Identifying assumption: unconfoundedness in the panel (after matching on observables, including outcome history, and controlling for FE and other variables)
- "Pseudo-outcome" (Imbens-Wooldridge 2009) test
  - Pre-treatment outcomes (Heckman-Hotz 1989)
- Balancing tests for covariates
  - Rosenbaum-Rubin standardized differences (bias)
  - *t*-tests
  - Hotelling's T^2 test by P-score quintiles
  - Smith-Todd regression test

Logged Employment Effects: Single Postloan Dummy

	Coefficient	Standard Error
Postloan	0.234	0.002
R^2	0.189	
Number of Observations	57,513,472	

Logged Employment Effects: Single Postloan Dummy & Loan Amount

	Coefficient	Standard Error
Postloan	0.266	0.003
Postloan*Log Loan Amount	0.072	0.002
R^2	0.190	
Number of Observations	55,610,968	

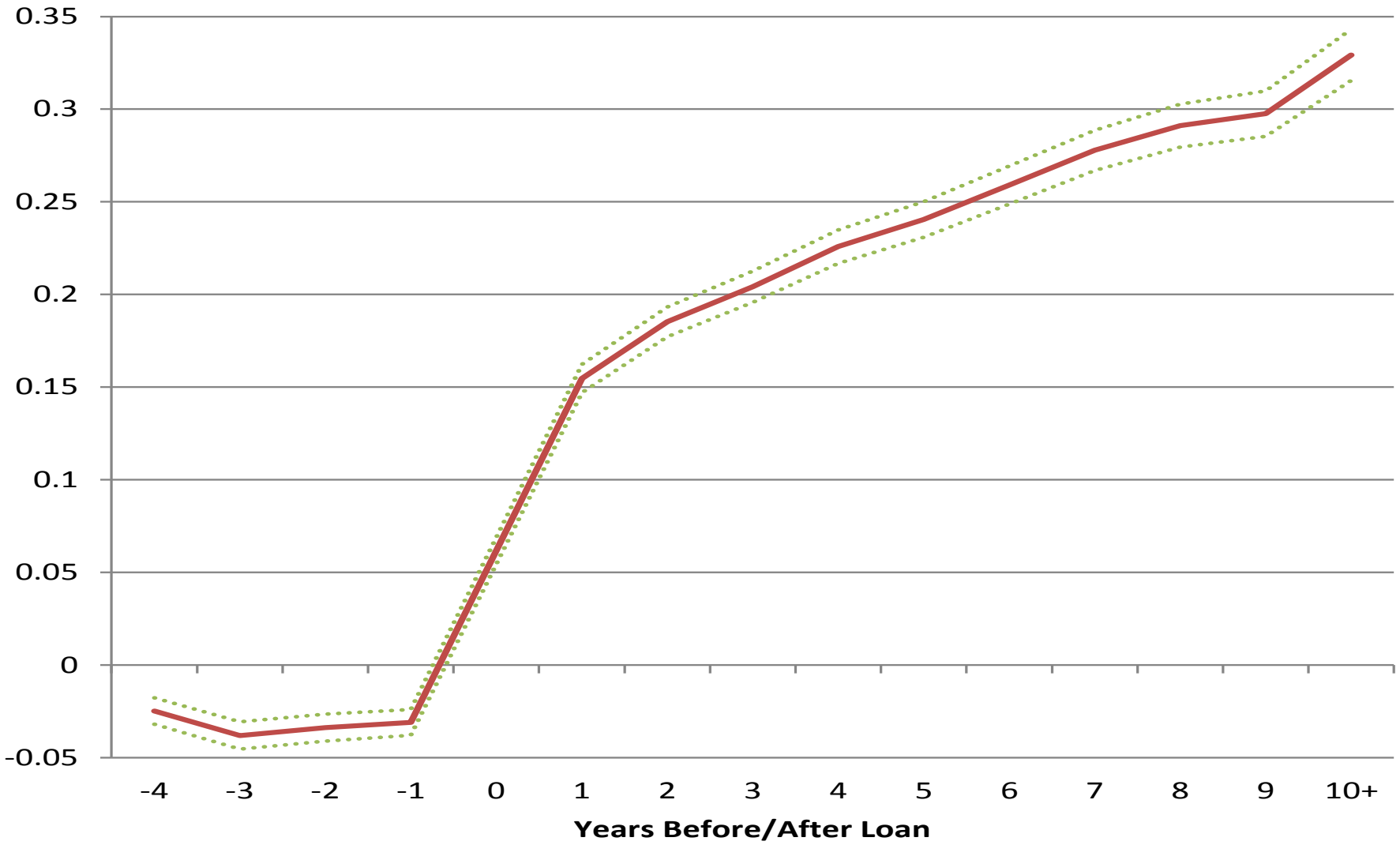
Unlogged Employment Effects: Single Postloan Dummy

	Coefficient	Standard Error
Loan Amount	2.903	0.094
R^2	0.025	
Number of Observations	57,513,472	

Unlogged Employment Effects: Loan Amount ($1,000's)

	Coefficient	Standard Error
Loan Amount	0.0092	0.0003
R^2	0.025	
Number of Observations	55,610,968	

Employment Effects by Year Before/After Loan with Matched Controls



Logged Employment Effects: Distance from Controls, Single Postloan Dummy, Year 2000

Distance Category	Coefficient	Standard Error
<=20 miles	0.245	0.017
20-150 miles	0.240	0.015
150+ miles	0.241	0.015
Nearest 4 Controls	0.241	0.013
Furthest 4 Controls	0.251	0.015

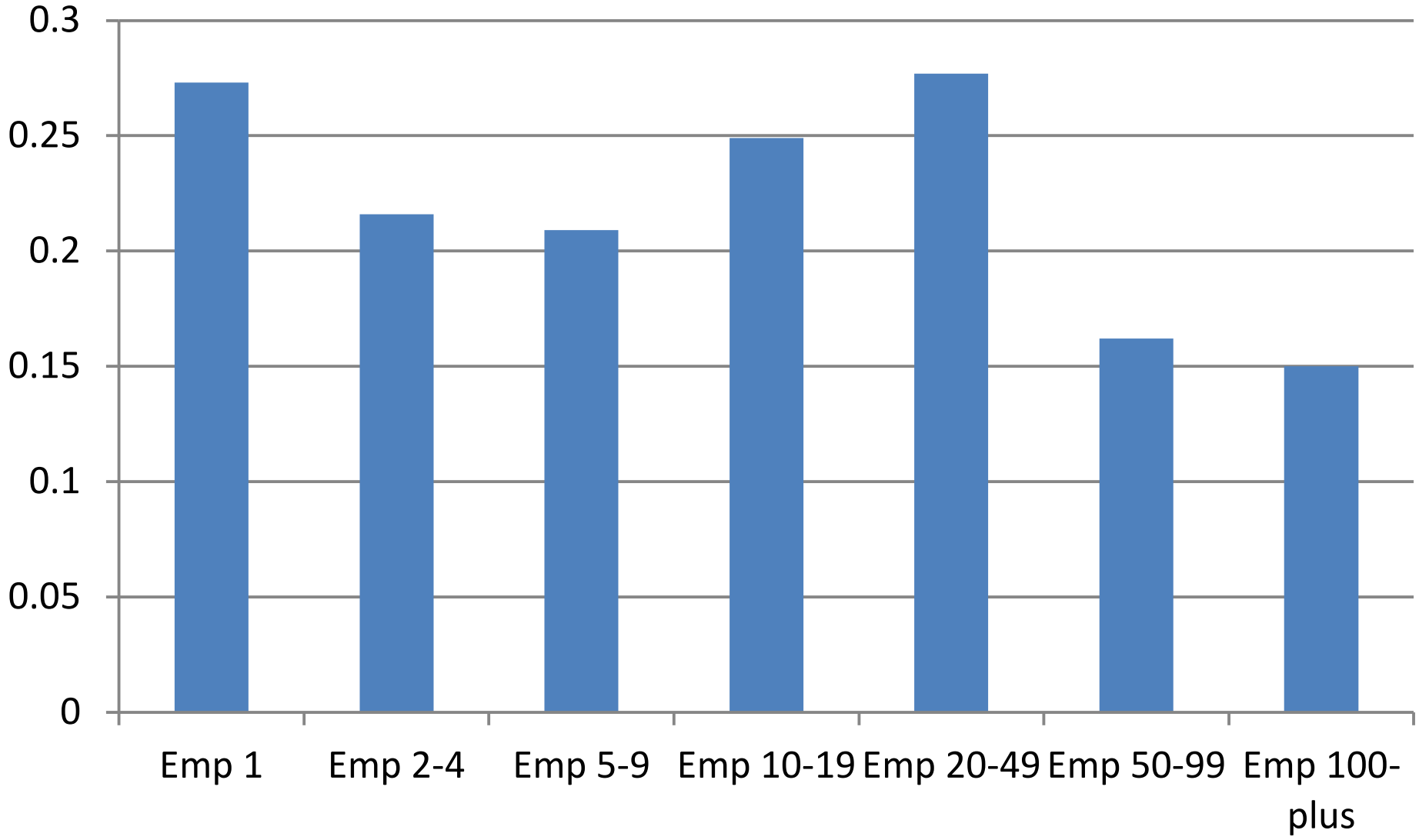
Unlogged Employment Effects: Distance from Controls, Loan Amount ($1,000's), Year 2000

Distance Category	Coefficient	Standard Error
<=20 miles	0.0067	0.0009
20-150 miles	0.0069	0.0009
150+ miles	0.0068	0.0009
Nearest 4 Controls	0.0064	0.0007
Furthest 4 Controls	0.0065	0.0007

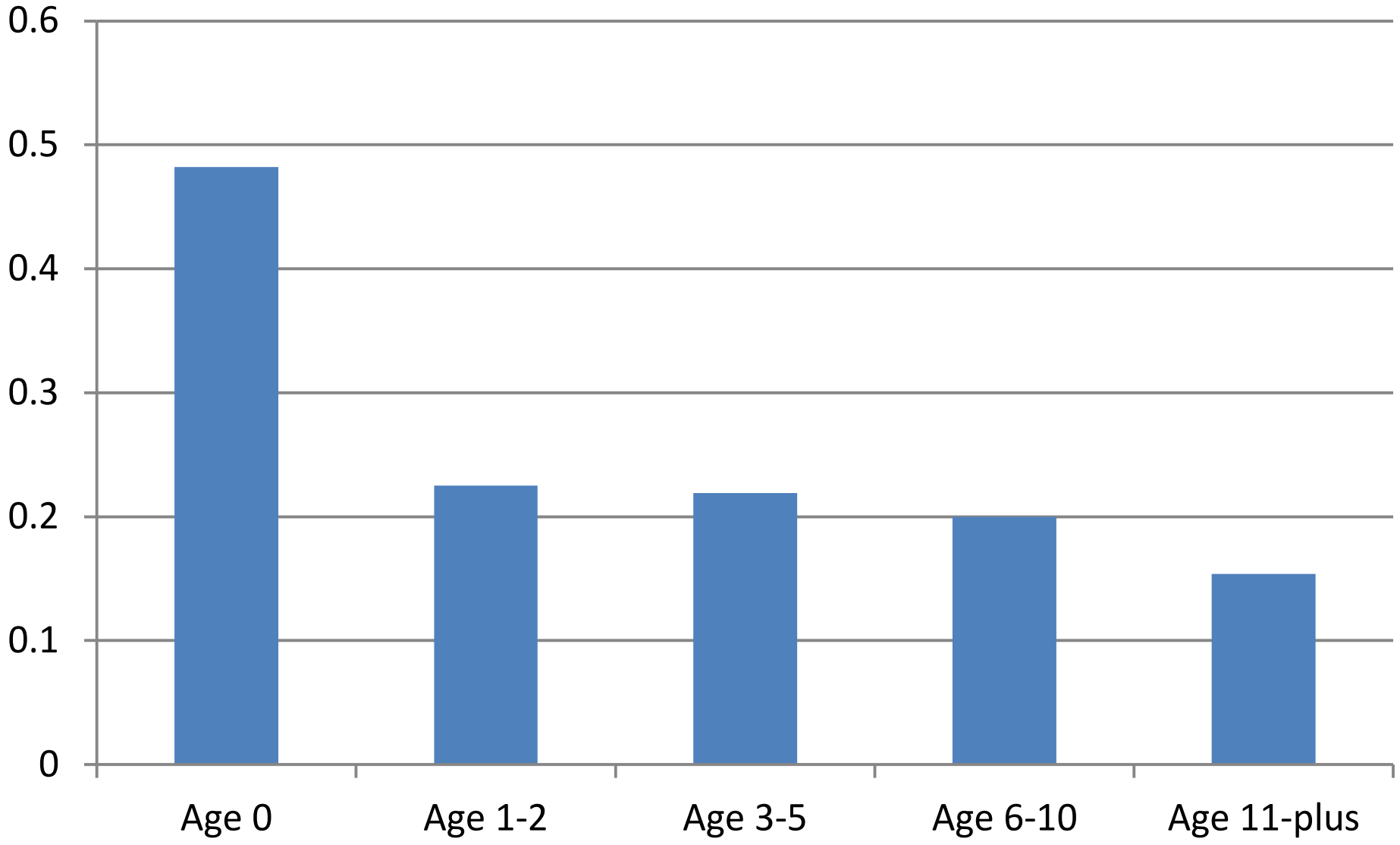
Employment Effects: Loan by Unemployment Rate

	Coefficient	Standard Error
Postloan	0.2200	0.0031
Postloan*Unemployment	0.0029	0.0004
R^2	0.242	
Number of Observations	57,513,472	

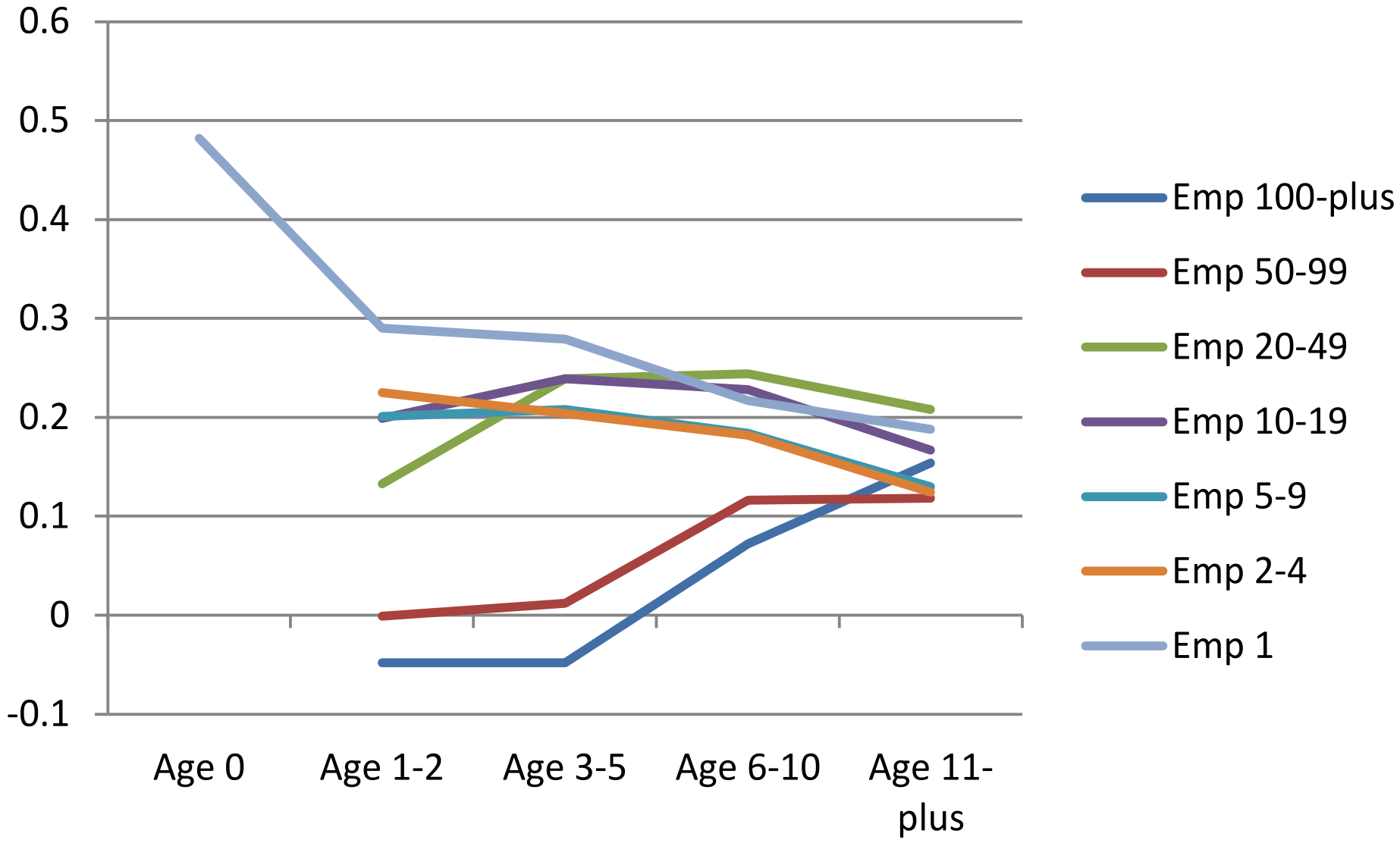
Employment Effects by Pre-Loan Size



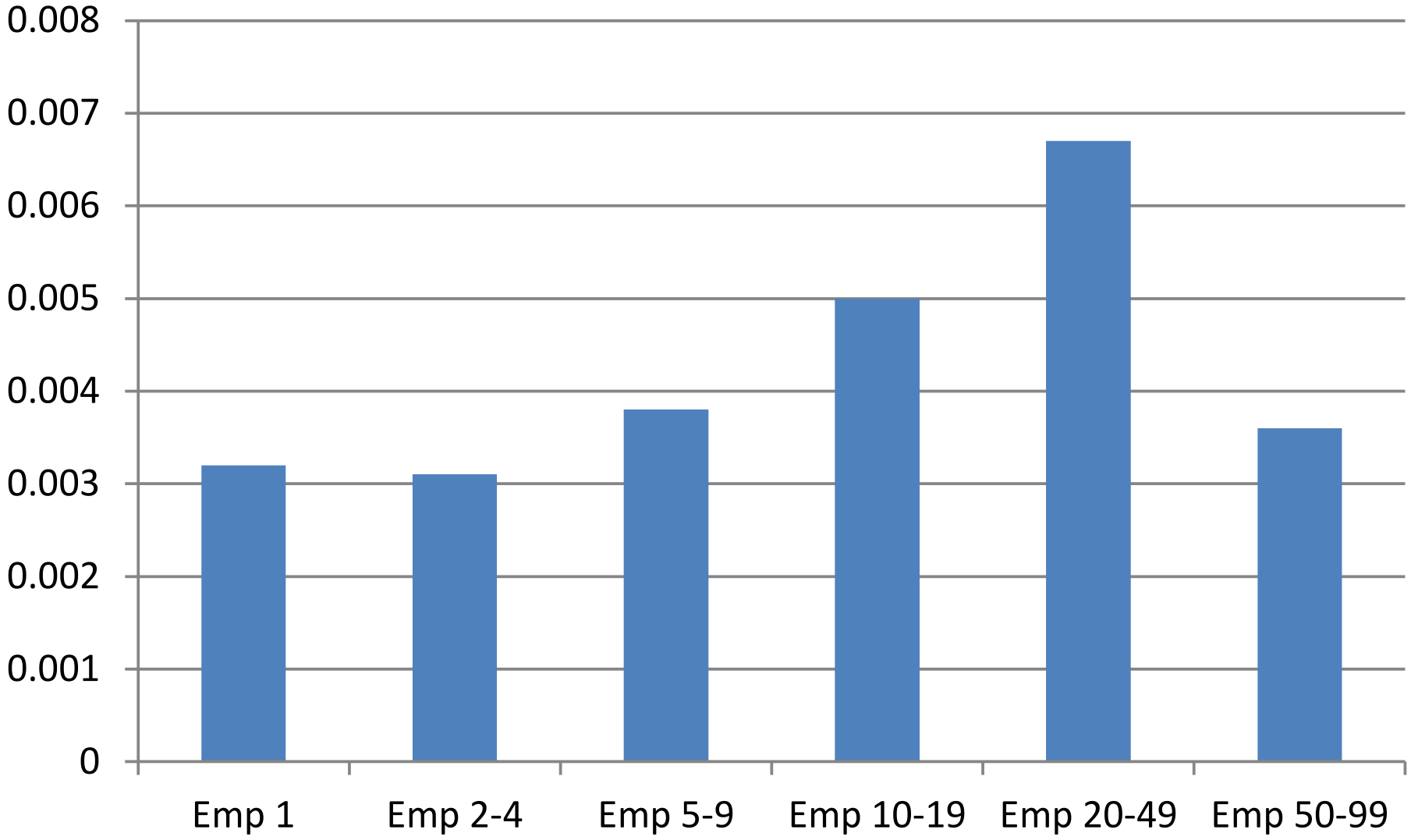
Employment Effects by Age



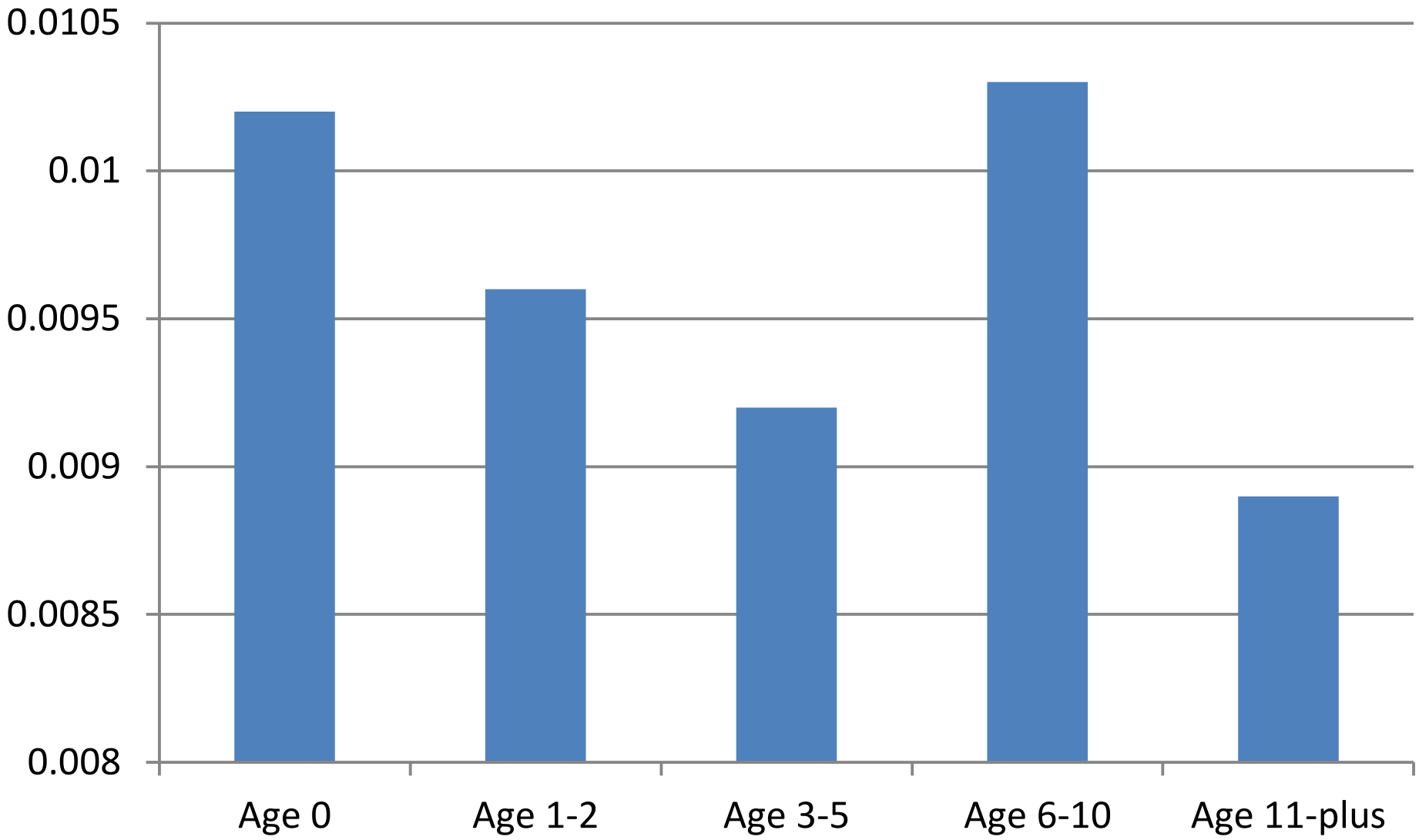
Employment Effects by Age and Pre-Loan Size



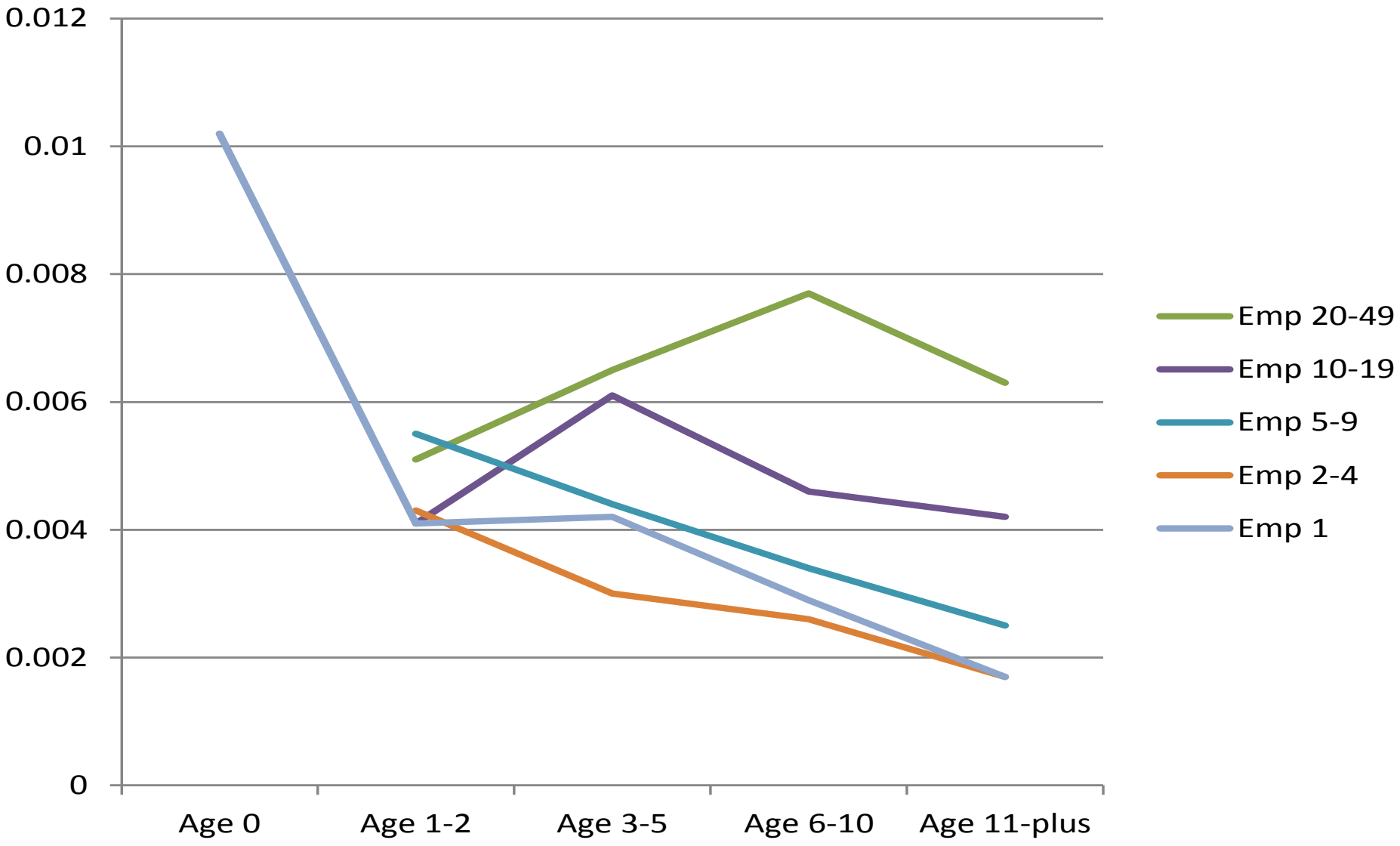
Employment Effects per $1,000 Loan by Pre-Loan Size



Employment Effects per $1,000 Loan by Age



Employment Effects per $1,000 Loan by Age and Pre-Loan Size



Preliminary Conclusions

- SBA loans associated with 23% employment gain for incumbent firms
- Immediate and permanent effect
- No evidence of displacement effects
- Effects stronger in weak labor markets

Preliminary Conclusions

- Among smaller firms, the loan effect decreases with age
- Among larger firms, the loan effect increases with age
- Cost of creating a job decreases with size
- Among smaller firms, cost of creating a job increases with age
- Among larger firms, cost of creating a job decreases with age