Capital Tax Reform and the Real Economy: The Effects of the 2003 Dividend Tax Cut

Danny Yagan
UC-Berkeley and NBER

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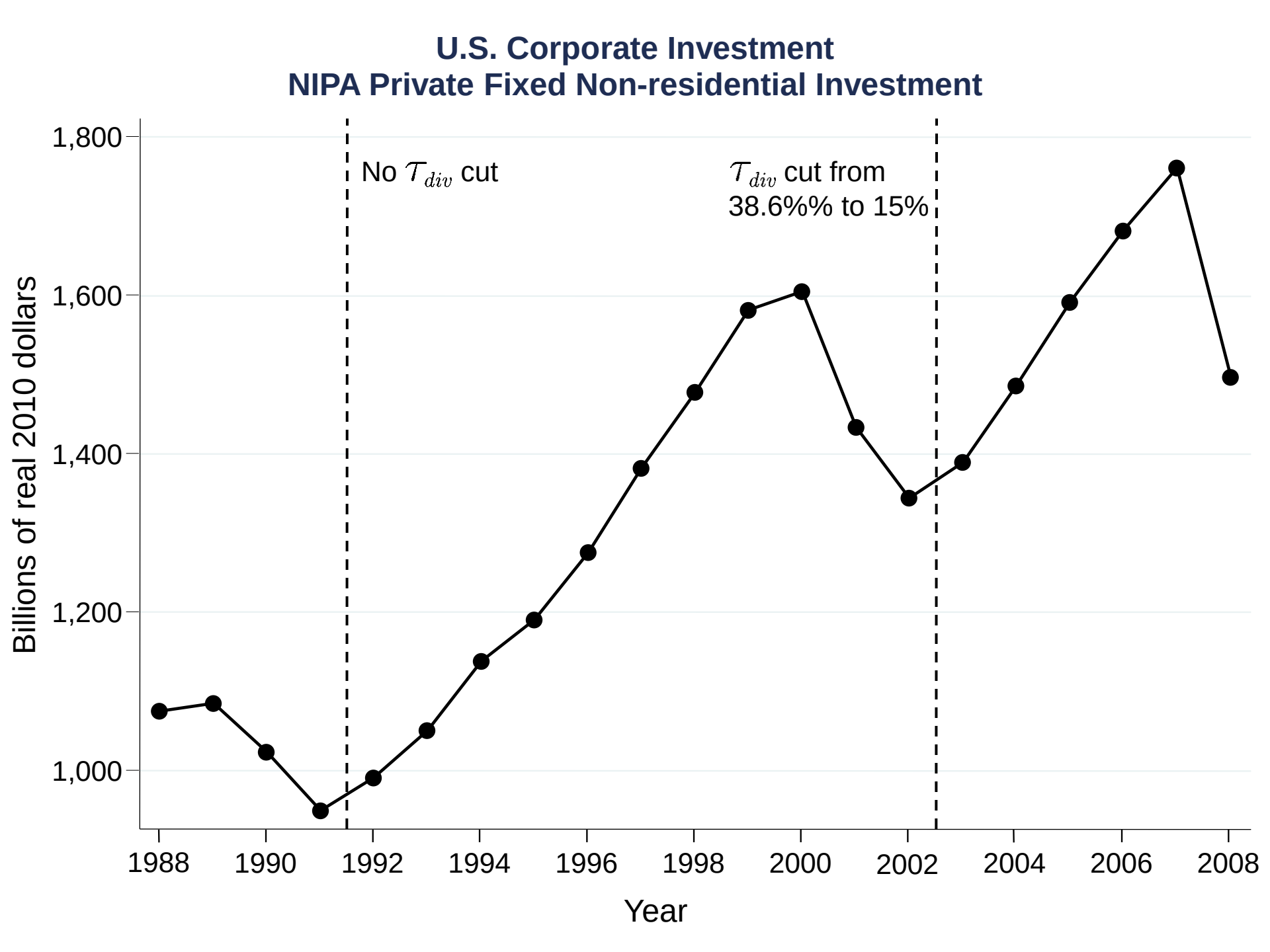
This work does not necessarily reflect the IRS's interpretation of the data

Largest capital tax rate change in decades

- 2003 dividend tax cut reduced top federal rate from 38.6% to 15%
- Question: Did it increase medium-run investment and labor earnings?
  - Dividend tax cuts reduce the cost of capital
    [Harberger 1962, 1966; Feldstein 1970; Poterba Summers 1985]
  - Investment responds to the cost of capital [Hall Jorgenson 1967; Caballero 1994; Cummins, Hassett, Hubbard 1994; Caballero, Engel, Haltiwanger 1995]
- No direct evidence


U.S. Corporate Investment
NIPA Private Fixed Non-residential Investment
No τ_{div} cut
τ_{div} cut from
38.6%% to 15%
Billions of real 2010 dollars
1,800
1,600
1,400
1,200
1,000
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
Year

This paper

- Question: Did the 2003 dividend tax cut increase corporate investment and employee compensation over the medium run?
- Strategy: Control for the business cycle using unaffected corporations
- Data: U.S. corporate income tax returns
- Real outcomes: Corporate investment and employee compensation
  - Validate design with financial outcomes [Chetty Saez 2005; Brown Liang Weisbenner 2007; Blouin Raedy Shackelford 2011; Edgerton 2012]
  - Interpret with theory: traditional vs. new view [Harberger 1966, Feldstein 1970, Poterba Summers 1985 vs. King 1977, Auerbach 1979, Bradford 1981]

Strategy: C-corporations vs. S-corporations

- After incorporating, a corporation elects either C or S tax status

	Tax rate on annual income	Tax rate on dividends
C-corporations (treatment)	35%	15%
S-corporations (control)	35%	0%

- S-corporations: <100 non-institutional shareholders, one stock class
- Compete in the same narrow industries and at the same scale throughout the United States → common trends

Example: Retail hardware chains

- Largest hardware chain
- C-corporation

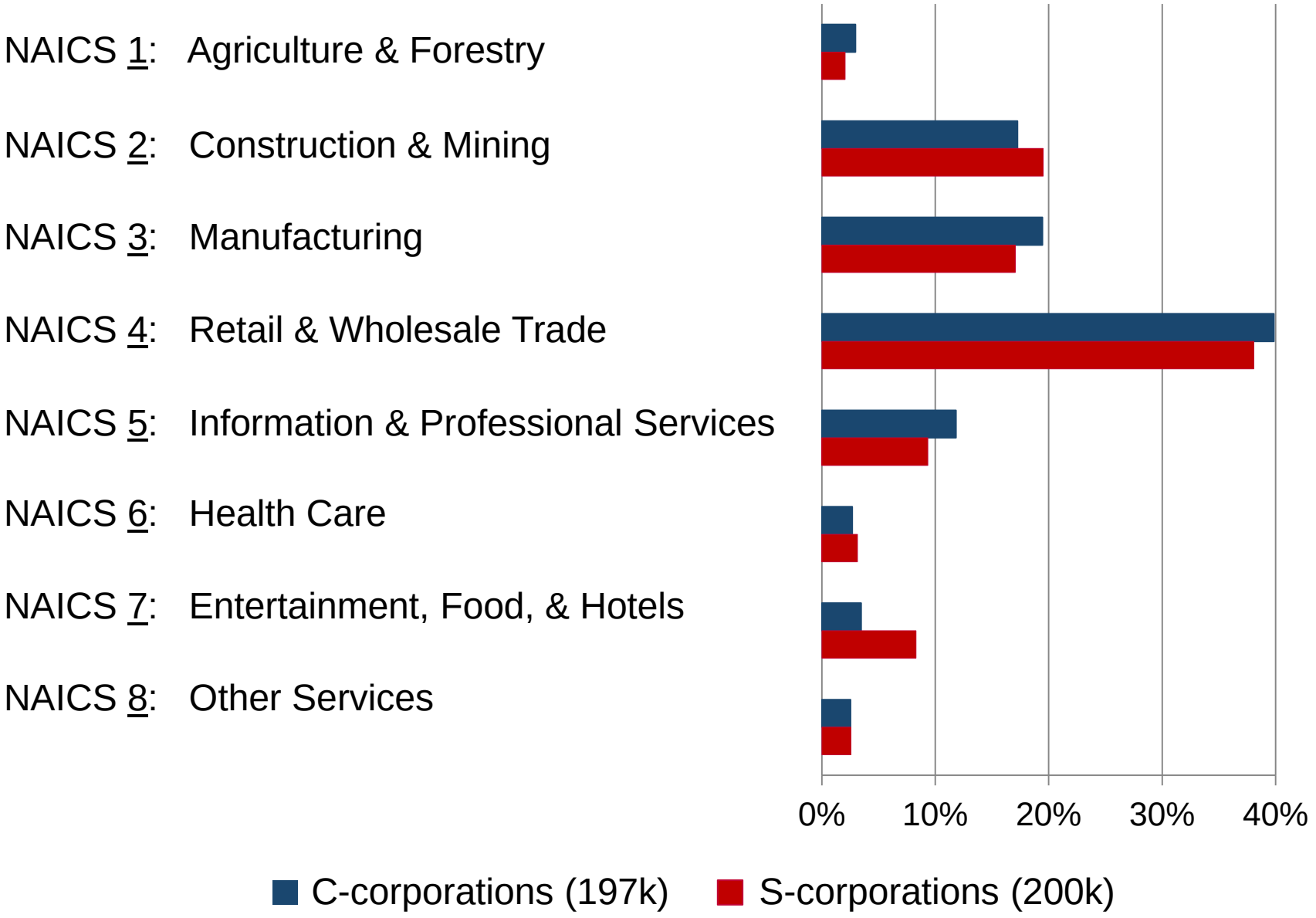
- Third-largest hardware chain
- S-corporation

Note: Only public sources were used to populate this slide.

Example: Retail Hardware Chains in Suburban Chicago

Note: Only public sources were used to populate this slide.

Sector Distribution of U.S. Corporations in 2002
$1m-$1bn in Assets, $500k-$1.5bn in Revenue



Example of Narrow Industry Distribution of U.S. Corporations in 2002
$1m-$1bn in Assets, $500k-$1.5bn in Revenue

NAICS 4231: Motor Vehicle Supplies

NAICS 4232: Furniture

NAICS 4233: Lumber

NAICS 4234: Professional & Commercial Supplies

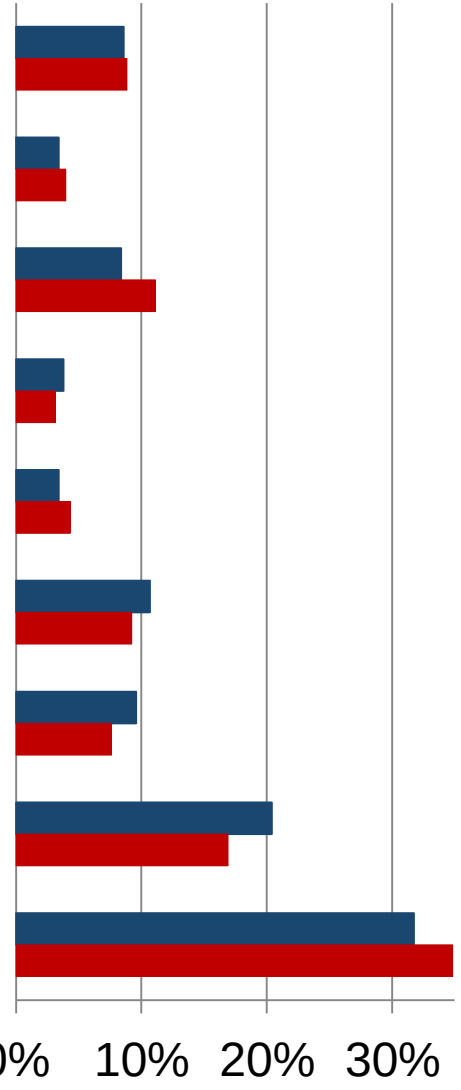
NAICS 4235: Metal and Mineral Supplies

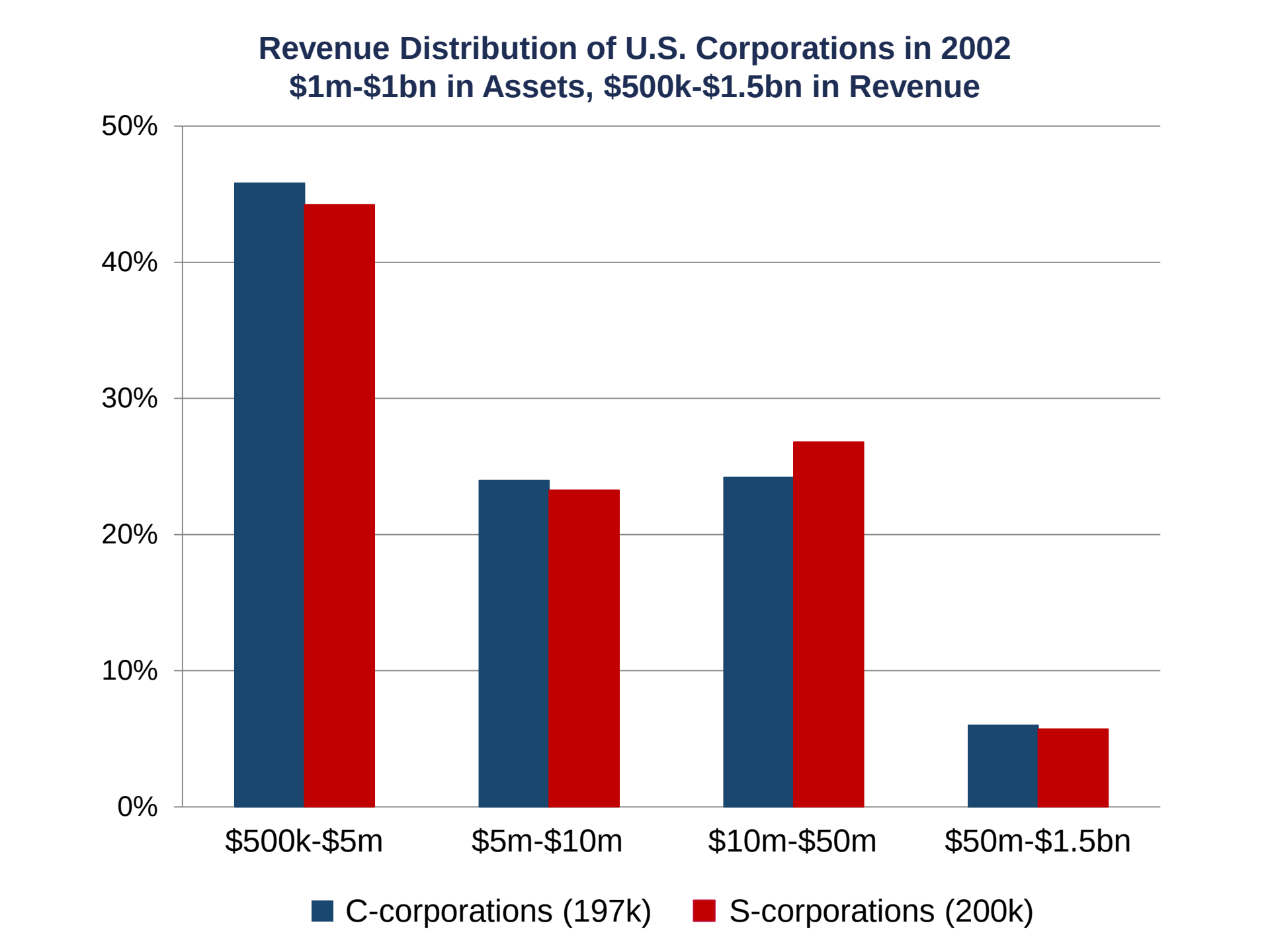
NAICS 4236: Electrical Supplies

NAICS 4237: Hardware, Plumbing, & Heating Supplies

NAICS 4238: Machinery Supplies

NAICS 4239: Sports, Toys, and Jewelry Supplies




Revenue Distribution of U.S. Corporations in 2002
$1m-$1bn in Assets, $500k-$1.5bn in Revenue
50%
40%
30%
20%
10%
0%
$500k-$5m
$5m-$10m
$10m-$50m
$50m-$1.5bn
C-corporations (197k)
S-corporations (200k)

Jobs and Growth Tax Relief and Reconciliation Act

- Reduced top federal+state dividend tax rate from 44.7% to 20.8%
  [Poterba 2004: average economy-wide decline from 32.1% to 18.5%]
  - Applied only to C-corporations
  - Proposed January 2003, passed May 2003
  - Scheduled to sunset but mostly made permanent in 2013

- Other provisions
  - Expanded accelerated depreciation through 2005 [similar effects on C and S]
  - Reduced top capital gains rate [similar effects on C and S]
  - Accelerated already-legislated (in 2001) reduction of top personal rate (37.6% in 2004 and 35% in 2006) [design passes placebo tests, and reduction in top personal rate affected S-corporation cost of capital similarly pre- and post-2003]

General equilibrium considerations

- With GE effects, estimate treatment effects net of potential interference [Hausman 1981, 1985; Feldstein 1995; Eissa Hoynes 2004]
  - Inelastic supply of capital goods [Goolsbee 1998]
    → C-corporation investment displaces S-corporation investment
    → Design overstates magnitude of effect of tax cut

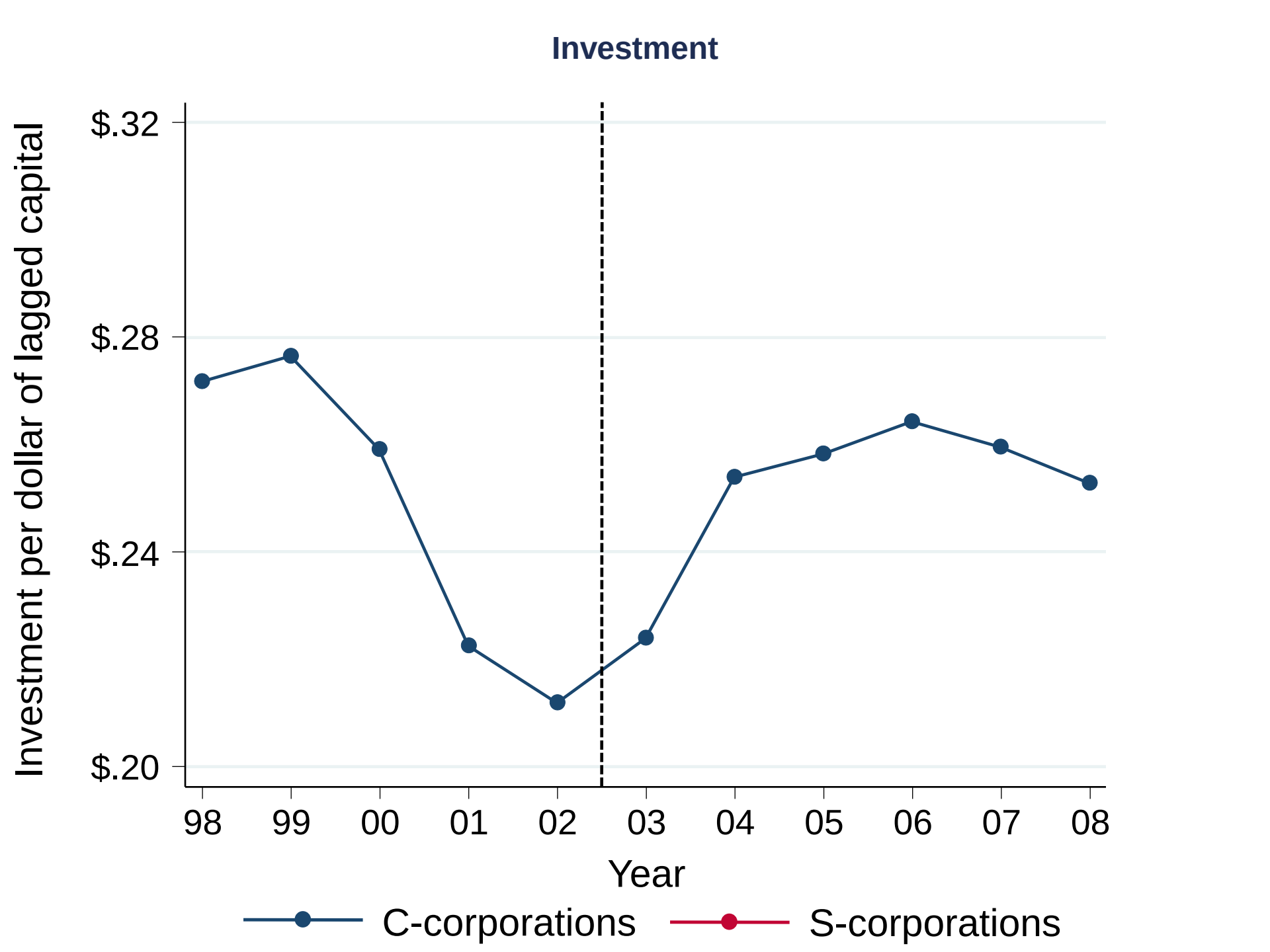
Data: U.S. corporate tax returns

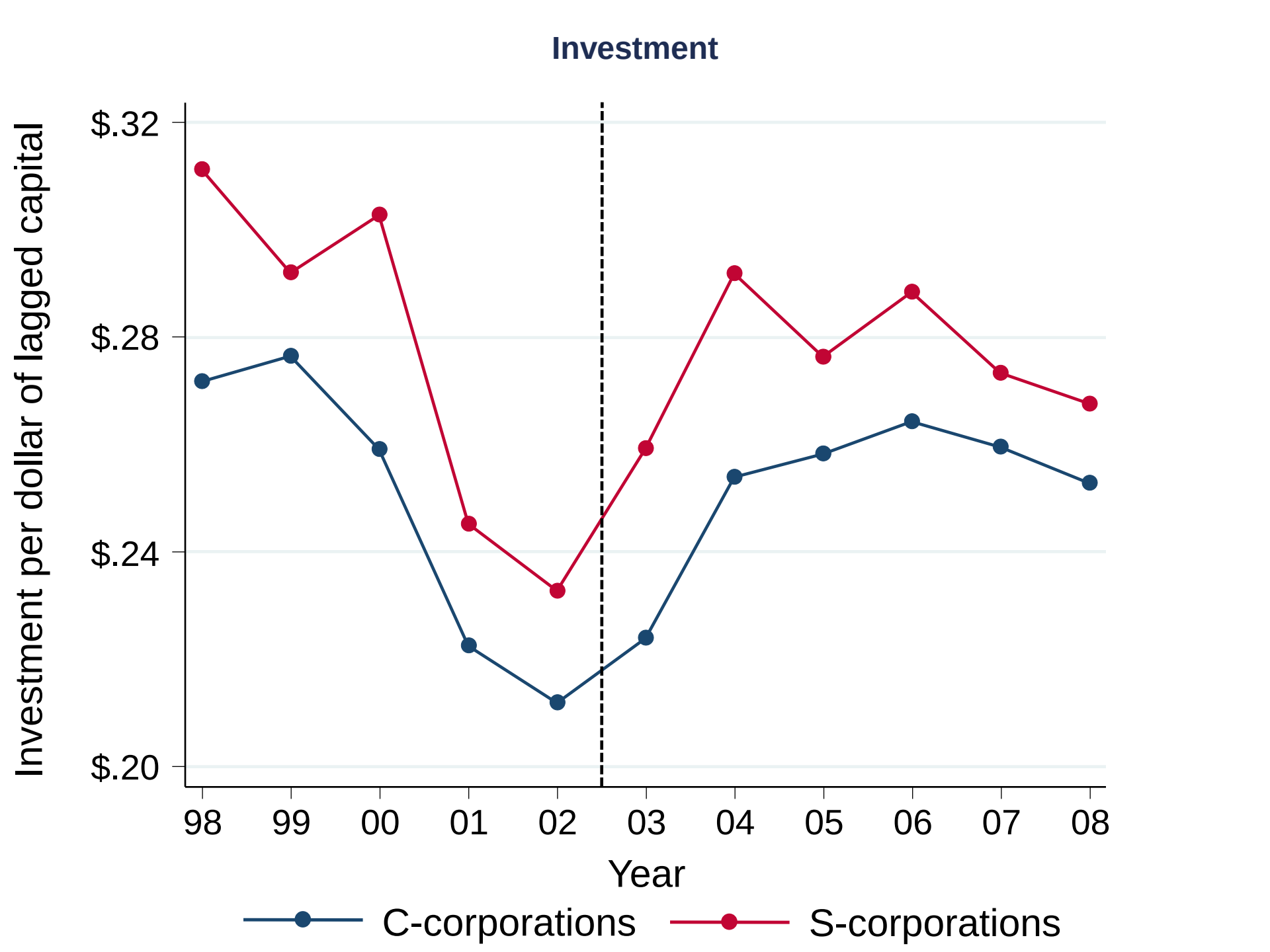
- Main analysis sample: unbalanced SOI panel 1998-2008
  - Assets \$1m-\$1bn, revenue \$500k-\$1.5bn over previous two years
  - Private through previous year
  - Non-financial, non-utilities [Chetty Saez 2005]
- Real outcomes
  - Investment: purchase price of all newly installed capital
  - Net investment: change in tangible capital assets
  - Employee compensation
- Scaling: lagged tangible capital assets or revenue
- Winsorizing: 95^{th} percentile
- Controls: age, lagged revenue, lagged profit margin, growth; industry
- Weighting: dollar-weighted and DFL re-weighted on size-x-industry

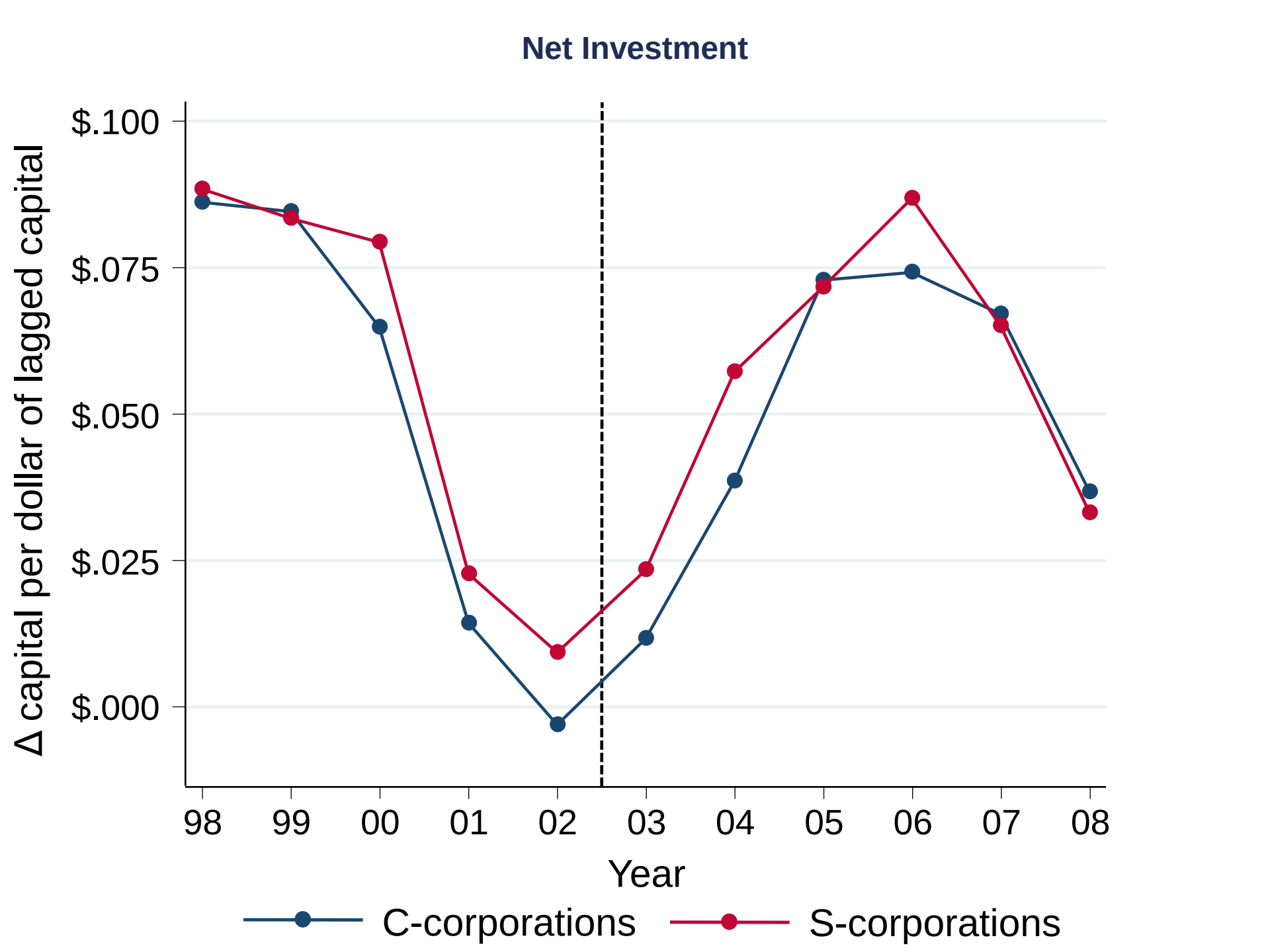
Unweighted Summary Statistics of Main Analysis Sample

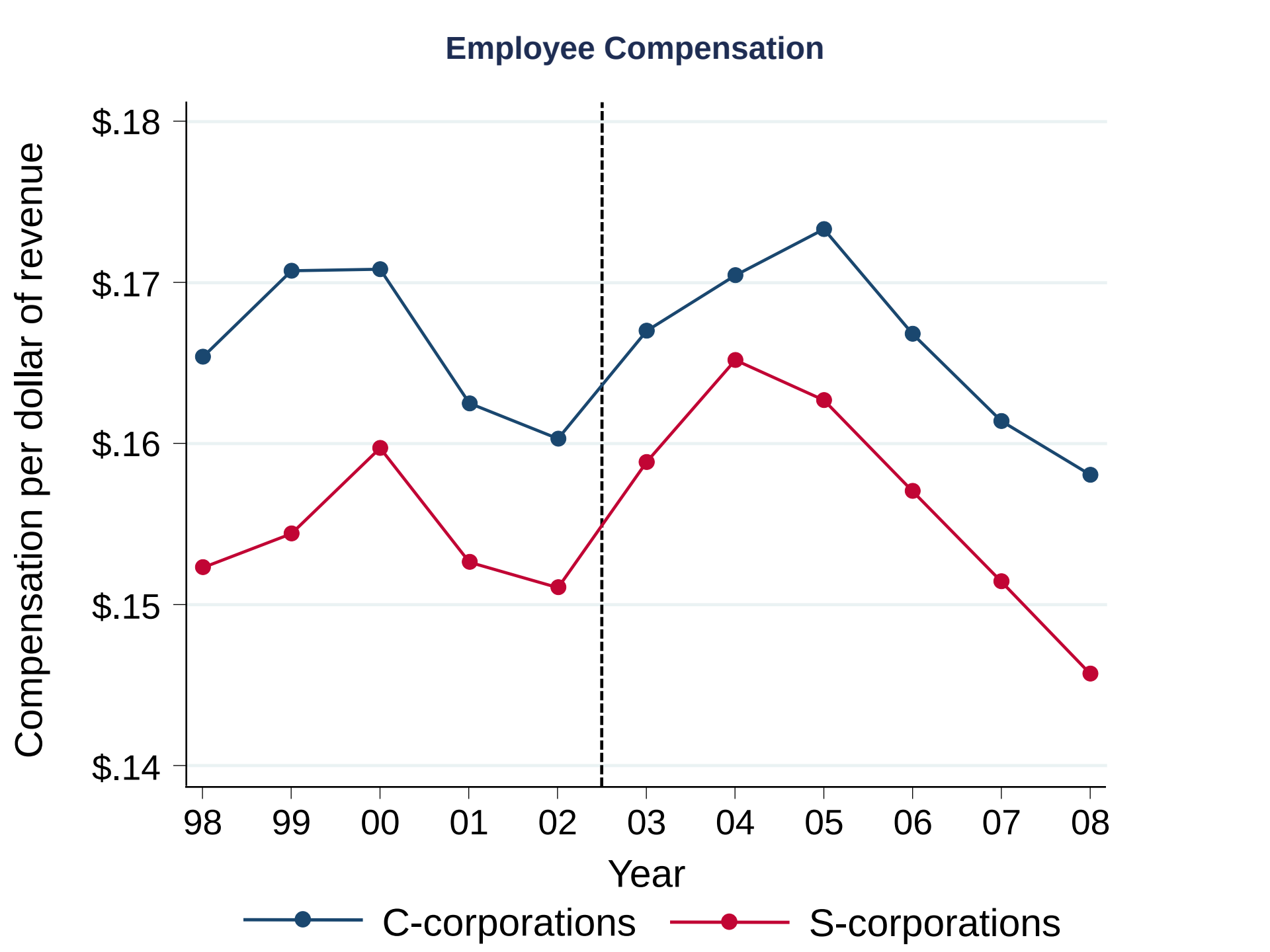
	C-corporations			S-corporations		
	Mean (1)	Median (2)	90th (3)	Mean (4)	Median (5)	90th (6)
Characteristics:						
Lagged revenue ($m)	69.2	26.4	164.1	76.4	42.3	170.0
Lagged assets ($m)	45.3	16.9	105.0	35.5	19.3	74.9
Lagged tangible capital assets ($m)	10.8	2.0	25.0	7.8	2.3	17.4
Age (years)	26	22	52	27	23	51
Outcomes:						
Investment ($m)	2.2	0.2	4.6	1.9	0.3	3.8
Employee compensation ($m)	12.4	3.8	28.2	11.3	5.0	24.2
Number of firm-year observations		195,033			137,996	
Number of firms		43,988			32,113	

- Weighted mean lagged revenue: $281m


Investment
$.32
$.28
$.24
$.20
Investment per dollar of lagged capital
98
99
00
01
02
03
04
05
06
07
08
Year
C-corporations
S-corporations


Investment
Investment per dollar of lagged capital
$.32
$.28
$.24
$.20
98
99
00
01
02
03
04
05
06
07
08
Year
C-corporations
S-corporations


Net Investment
$.100
$.075
$.050
$.025
$.000
Δ capital per dollar of lagged capital
98
99
00
01
02
03
04
05
06
07
08
Year
C-corporations
S-corporations


Employee Compensation
Compensation per dollar of revenue
$.18
$.17
$.16
$.15
$.14
98
99
00
01
02
03
04
05
06
07
08
Year
C-corporations
S-corporations

Effect of the 2003 Dividend Tax Cut on Investment
DD Estimates and Elasticities

Dependent variable:	Investment ($ per lagged capital)	
	(1)	(2)
C-Corp × Post-2003	0.0008	-0.0002
	(0.0044)	(0.0042)
Lagged controls		X
N (firm-years)	333,029	333,029
Clusters (firms)	73,188	73,188
R^2	0.01	0.07
Pre-2003 C-corp mean	0.2428	0.2428
Pre-2003 C-corp s.d.	0.2514	0.2514
Implied ε wrt $(1-\tau_{div})$	0.01	0.00
	[-0.08, 0.09]	[-0.08, 0.08]
Effect size (s.d.)	0.00	0.00
	[-0.03, 0.04]	[-0.03, 0.03]

$$INVESTMENT_{it} = \alpha_1 CCORP_{i,t-2} + \alpha_2 CCORP_{i,t-2} \times POST_t + \mathbf{X}_{i,t-2}\boldsymbol{\beta} + \mathbf{YEAR}_t\boldsymbol{\gamma}$$

Effect of the 2003 Dividend Tax Cut on Employee Compensation
DD Estimates and Elasticities

Dependent variable:	Employee compensation ($ per lagged revenue)	
	(1)	(2)
C-Corp × Post-2003	-0.0013	-0.0013
	(0.0025)	(0.0020)
Lagged controls		X
N (firm-years)	333,029	333,029
Clusters (firms)	73,188	73,188
R^2	0.00	0.37
Pre-2003 C-corp mean	0.1647	0.1647
Pre-2003 C-corp s.d.	0.1415	0.1415
Implied ε wrt $(1-\tau_{div})$	-0.02	-0.02
	[-0.09, 0.05]	[-0.07, 0.04]
Effect size (s.d.)	-0.01	-0.01
	[-0.04, 0.03]	[-0.04, 0.02]

$$EMPLOYEECOMP_{it} = \alpha_1 CCORP_{i,t-2} + \alpha_2 CCORP_{i,t-2} \times POST_t + \mathbf{X}_{i,t-2}\boldsymbol{\beta} + \mathbf{YEAR}_t\boldsymbol{\gamma}$$

Robustness

- Variations already shown:
  - Outcomes: Net investment and employee compensation
  - Specifications: With and without controls

- Additional tests:
  - Winsorize: 99^{th} percentile
  - Scaling: Lagged revenue
  - Allowing for differential pre-period trends
  - Subsample: 1998-2004 only (C vs. S status defined 2002 or earlier)
  - Balanced panel (only the outcome of interest varies year-to-year)

  - Pre-2003 placebo tests

Effect of the 2003 Dividend Tax Cut on Investment
Robustness

Dependent variable:	Investment ($ per lagged capital)				
	(1)	(2)	(3)	(4)	(5)
C-Corp × Post-2003	-0.0118	-0.0021	-0.0157	-0.0136	-0.0063
	(0.0066)	(0.0004)	(0.0119)	(0.0051)	(0.0226)
Lagged controls	X	X	X	X	
Trimmed at 99th pctile	X				
Scaled by lagged rev.		X			
Pre-trend controls			X		
Years 1998-2004 only				X	
Balanced panel w/ FEs					X
N (firm-years)	333,029	333,029	333,029	232,787	85,624
Clusters (firms)	73,188	73,188	73,188	63,048	7,784
Implied ε wrt (1-τ_{div})	-0.10	-0.20	-0.15	-0.13	-0.05
	[-0.2, 0.01]	[-0.28, -0.12]	[-0.37, 0.07]	[-0.22, -0.03]	[-0.4, 0.3]

$$INVESTMENT_{it} = \alpha_1 CCORP_{i,t-2} + \alpha_2 CCORP_{i,t-2} \times POST_t + \mathbf{X}_{i,t-2}\boldsymbol{\beta} + \mathbf{YEAR}_t\boldsymbol{\gamma}$$

Heterogeneity

- Overall zero result obscuring heterogeneous responses?
- Strategy: triple-differences along six firm-level traits: size, age, revenue growth, profit margin, cash/assets, leverage
  - Compute 20th and 80th percentiles of pooled C-corp distribution
  - Drop middle quintiles
  - Define indicator equal to 1 iff in top quintile
  - Estimate regression:

$$\begin{aligned} INVESTMENT_{it} = {} & \alpha_1 CCORP_{i,t-2} + \alpha_2 CCORP_{i,t-2} \times POST_t + \alpha_3 TRAIT_{i,t-2} \\ & + \alpha_4 CCORP_{i,t-2} \times TRAIT_{i,t-2} + \alpha_5 TRAIT_{i,t-2} \times POST_t \\ & + \boxed{\alpha_6 CCORP_{i,t-2} \times TRAIT_{i,t-2} \times POST_t} + \mathbf{X}_{i,t-2}\boldsymbol{\beta} + \mathbf{YEAR}_t\boldsymbol{\gamma} \end{aligned}$$

→ Continued zero results

Effect of the 2003 Dividend Tax Cut on Investment Heterogeneity

Dependent variable:	Investment ($ per lagged capital) (1)	Net investment ($ per lagged capital) (2)	Employee compensation ($ per lagged revenue) (3)
C-Corp × Post-2003			
× High lagged revenue	0.0103	-0.0017	-0.0042
	(0.0127)	(0.0102)	(0.0054)
× High age	0.0104	0.0003	-0.0055
	(0.0168)	(0.0144)	(0.0060)
× High lagged rev. growth	-0.0069	-0.0164	-0.0006
	(0.0160)	(0.0165)	(0.0082)
× High profit margin	-0.0265	0.0103	-0.0106
	(0.0167)	(0.0140)	(0.0109)
× High cash/assets	-0.0212	-0.0217	-0.0120
	(0.0155)	(0.0148)	(0.0115)
× High leverage	-0.0030	0.0144	-0.0120
	(0.0199)	(0.0190)	(0.0101)

External validity

- Suggestive evidence of different out-of-sample results?

1. Include 75% of public corporations that satisfy size restrictions
   - Value of regular dividends [Poterba Summers 1985; Bernheim 1991] vs. weaker treatment (dividends vs. capital gains)

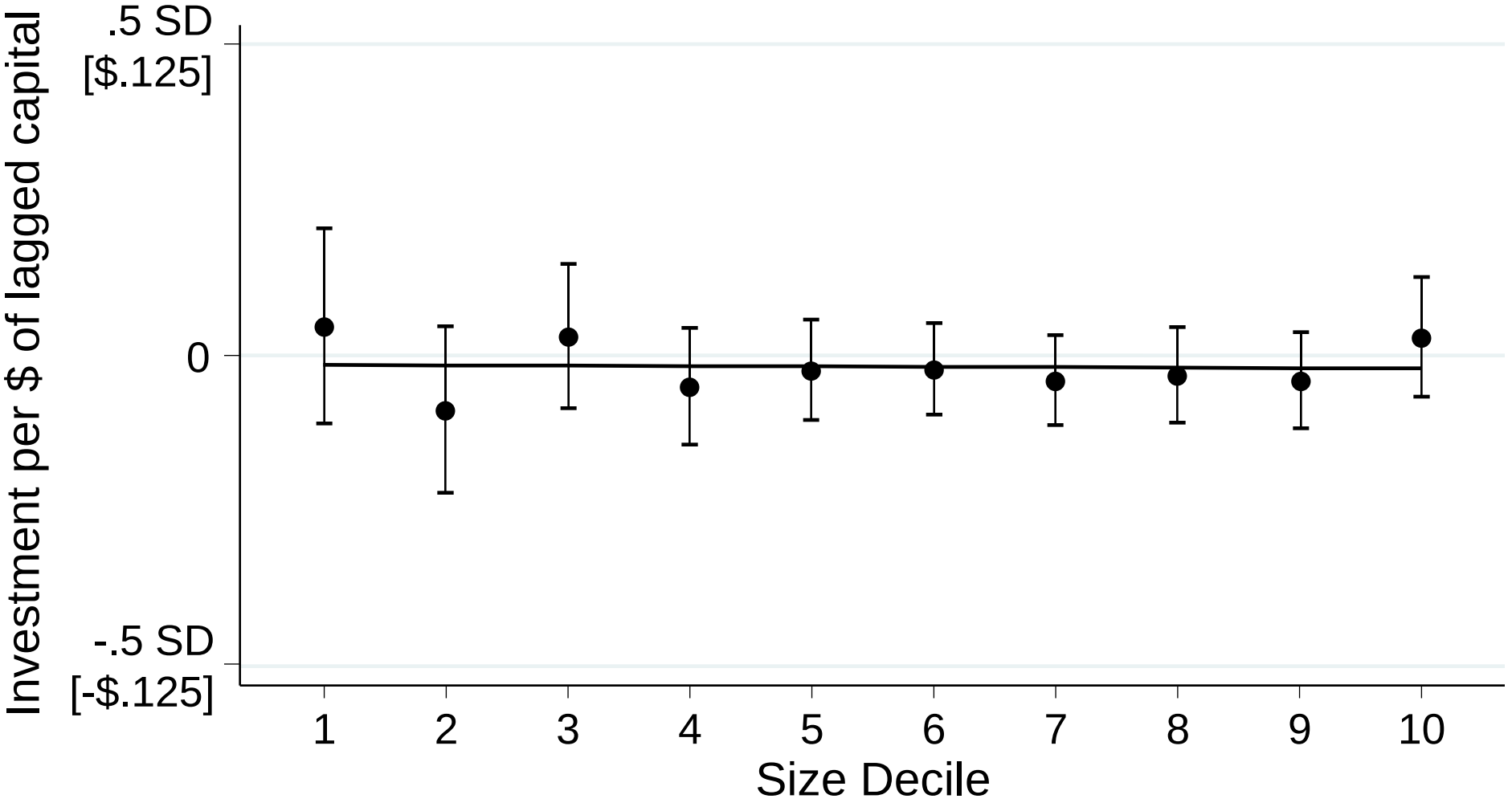
2. Estimate real effects by firm size decile

Effect of the 2003 Dividend Tax Cut on Investment
Including Public Corporations

Dependent variable:	Investment ($ per lagged capital)	
	(1)	(2)
C-Corp × Post-2003	-0.0023	-0.0019
	(0.0052)	(0.0050)
Lagged controls		X
N (firm-years)	356,758	356,758
Clusters (firms)	77,323	77,323
R^2	0.01	0.08
Pre-2003 C-corp mean	0.2479	0.2479
Pre-2003 C-corp s.d.	0.2532	0.2532
Implied ε wrt $(1-\tau_{div})$	-0.02	-0.02
	[-0.12, 0.07]	[-0.11, 0.07]
Effect size (s.d.)	-0.01	-0.01
	[-0.05, 0.03]	[-0.05, 0.03]

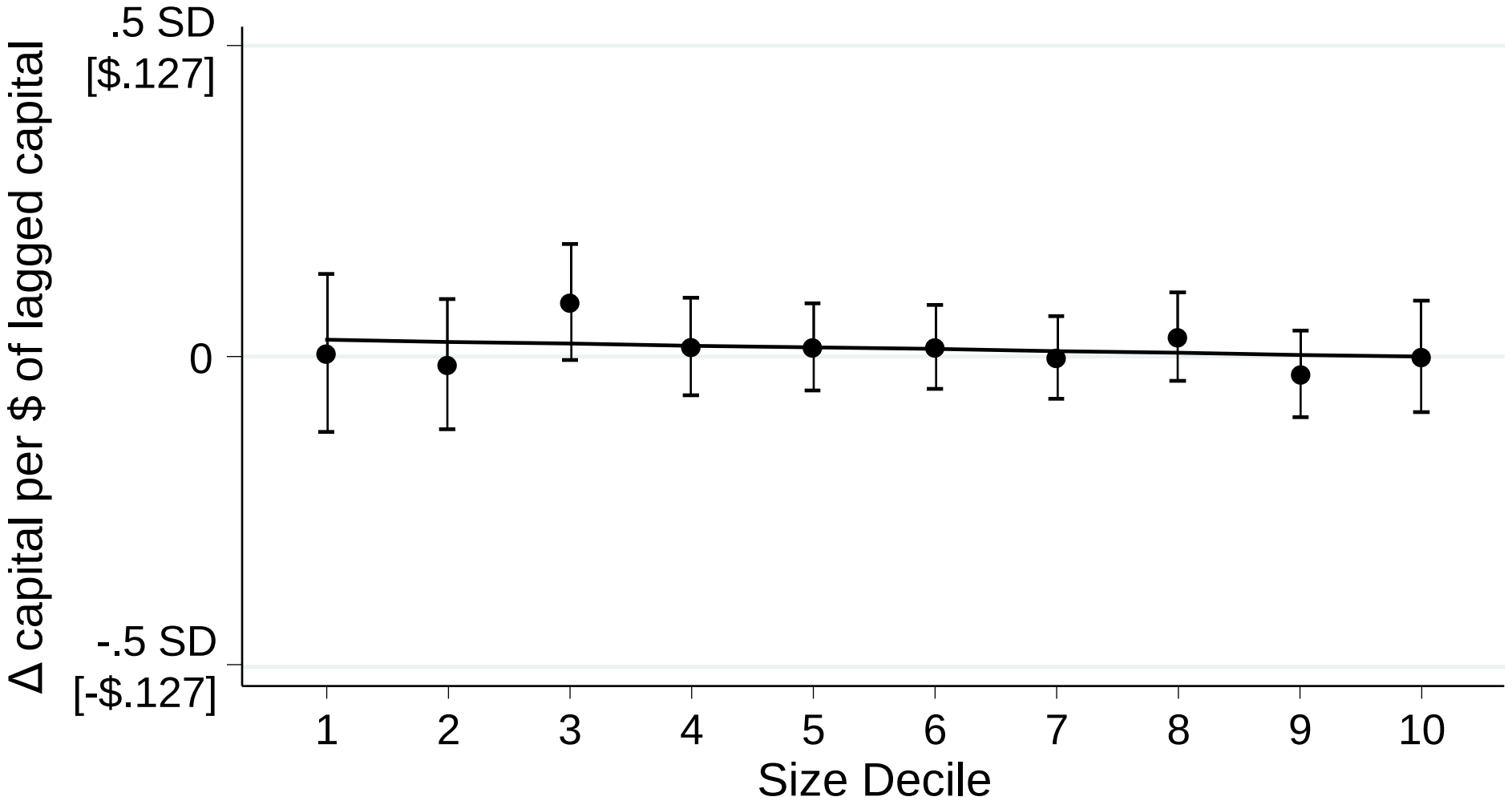
$$INVESTMENT_{it} = \alpha_1 CCORP_{i,t-2} + \alpha_2 CCORP_{i,t-2} \times POST_t + \mathbf{X}_{i,t-2}\boldsymbol{\beta} + \mathbf{YEAR}_t\boldsymbol{\gamma}$$

Investment Response by Firm Size Decile



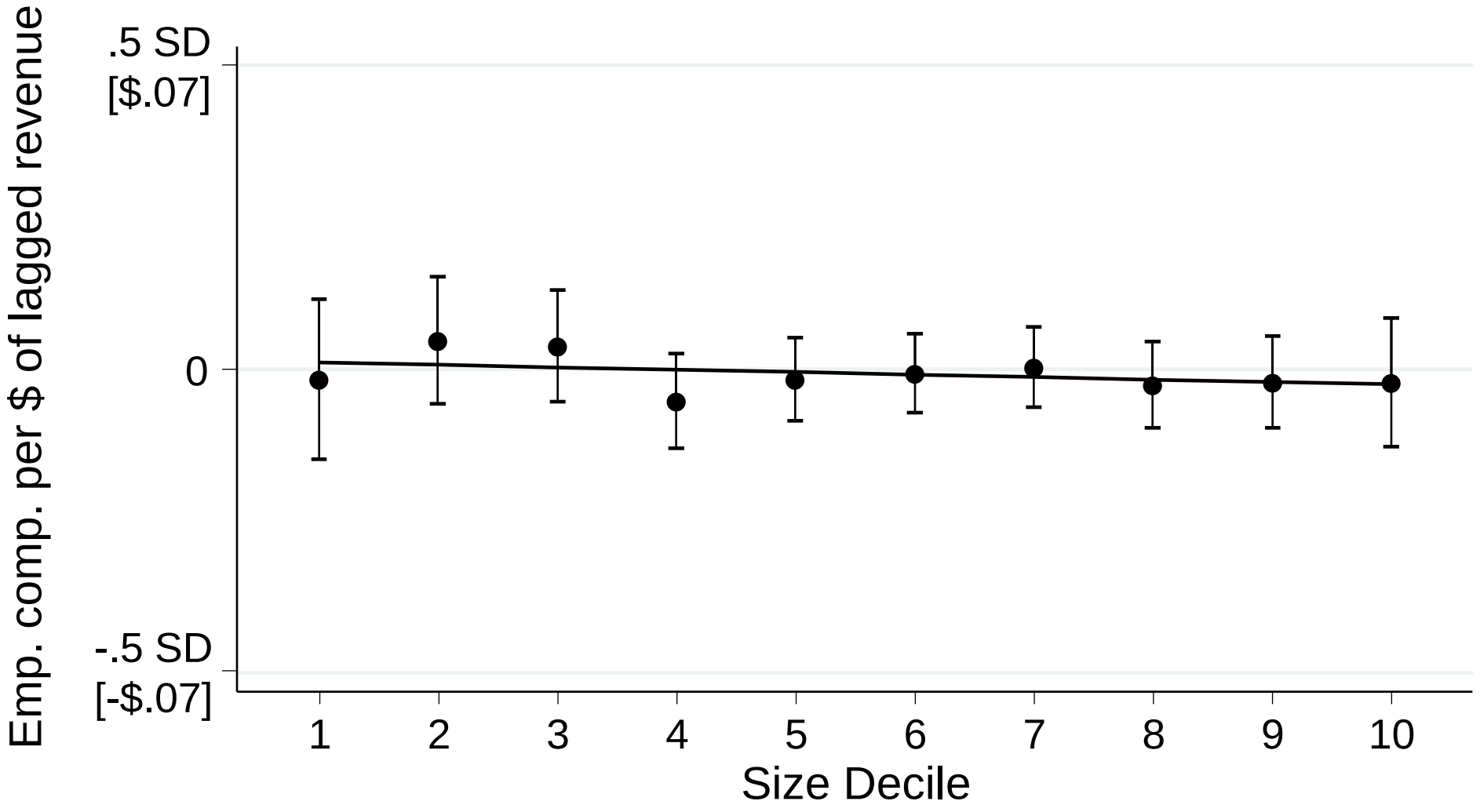
$$INVESTMENT_{it} = \alpha_1 CCORP_{i,t-2} + \alpha_2 CCORP_{i,t-2} \times POST_t + \mathbf{X}_{i,t-2}\boldsymbol{\beta} + \mathbf{YEAR}_t\boldsymbol{\gamma}$$

Net Investment Response by Firm Size Decile



$$NETINVESTMENT_{it} = \alpha_1 CCORP_{i,t-2} + \alpha_2 CCORP_{i,t-2} \times POST_t + \mathbf{X}_{i,t-2}\boldsymbol{\beta} + \mathbf{YEAR}_t\boldsymbol{\gamma}$$

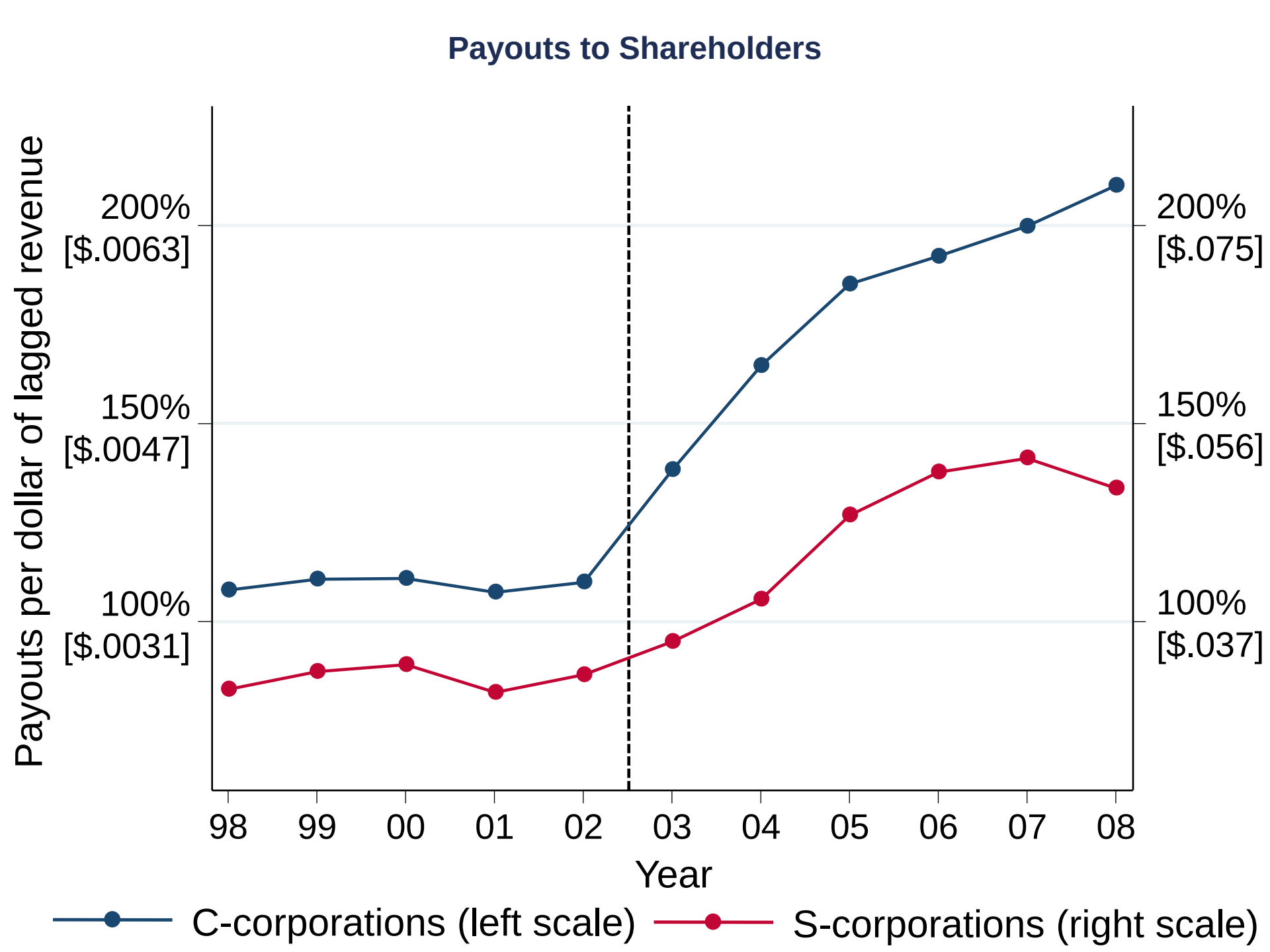
Employee Compensation Response by Firm Size Decile



$$EMPLOYEECOMP_{it} = \alpha_1 CCORP_{i,t-2} + \alpha_2 CCORP_{i,t-2} \times POST_t + \mathbf{X}_{i,t-2}\boldsymbol{\beta} + \mathbf{YEAR}_t\boldsymbol{\gamma}$$

Design validation: was tax cut actually relevant?

- Concern: perhaps some subtle provision neutralized applicability
- Strategy: test for behavioral response in financial payouts to shareholders (dividends + share buybacks)
  - Bears directly on corporate finance debate [Chetty Saez 2005; Blouin Raedy Shackelford 2007; Brown Liang Weisbenner 2007; Edgerton 2010]
- Empirical issue: higher base level of S-corporation payouts
  - Solution: two y-scalings (effectively transform comparison into percentage terms)


Payouts to Shareholders
Payouts per dollar of lagged revenue
200%
[$.0063]
150%
[$.0047]
100%
[$.0031]
200%
[$.075]
150%
[$.056]
100%
[$.037]
98
99
00
01
02
03
04
05
06
07
08
Year
C-corporations (left scale)
S-corporations (right scale)

Effect of the 2003 Dividend Tax Cut on Payouts
DD Estimates

Dependent variable:	Total payouts (%)	
	(1)	(2)
C-Corp × Post-2003	27.6	45.5
	(3.3)	(6.5)
C-Corp × Year-2003	21.4	30.5
	(4.1)	(4.6)
Lagged controls	X	X
Pre-trend controls		X
N (firm-years)	333,029	333,029
Clusters (firms)	73,188	73,188

$$PAYOUTS_{it} = \alpha_1 CCORP_{i,t-2} + \mathbf{X}_{i,t-2}\boldsymbol{\beta} + \mathbf{YEAR}_t\boldsymbol{\gamma} + \mathbf{CCORP}_{i,t-2} \times \mathbf{YEAR}_{i,t}\boldsymbol{\delta}$$

Interpretation: traditional vs. new view

1. What economic claim does the observed investment elasticity reject?

2. What are the candidate explanations for the zero result and what do they imply for the likely effects of future dividend tax cuts?

Traditional view parameterization

- Traditional view: Marginal investments are funded out of equity
  [Harberger 1962, 1966; Feldstein 1970; Poterba Summers 1985]

- $\varepsilon_{INV,1-\tau_{DIV}} = \varepsilon_{INV,CoC} \times \varepsilon_{CoC,1-\tau_{DIV}}$

  - Hassett-Hubbard (2002): $\varepsilon_{INV,CoC} \in [-0.5, -1.0]$
    [Cummins Hassett Hubbard 1994; Caballero Engel Haltiwanger 1995]

  - Desai-Goolsbee (2004) parameterize Poterba-Summers (1985):

$$CoC = \frac{r}{(1-\tau_{INC})\left[(1-\tau_{DIV})p + (1-\tau_{ACG})(1-p)\right]}$$

  Assume payout share $p = .5$ and top statutory change in τ_{DIV}
  → $\varepsilon_{CoC,1-\tau_{DIV}} = -0.411$

→ $\varepsilon_{INV,1-\tau_{DIV}} \in [0.21, 0.41]$ > 2.5x the estimated 95% upper bound (.08)

Focus on small cost-of-capital change

- Unlikely that $\varepsilon_{INV,CoC}$ was temporarily low
  [Bertola Caballero 1994; Caballero Engel Haltiwanger 1995; Goolsbee 1998]

- Possible that consensus estimates of $\varepsilon_{INV,CoC}$ are biased upward
  [Eisner 1969, 1970; House Shapiro 2008]

- Focus here: why would $\varepsilon_{CoC,1-\tau_{DIV}}$ have been small?
  - "Wrong view"
  - "Wrong parameterization"

Wrong-view explanation

- New view: marginal investments are funded out of retained earnings
  [King 1977; Auerbach 1979; Bradford 1981]

- C-corporations issue no equity or risky debt and choose investment to equalize marginal returns on retained earnings and payouts:

$$\text{Return to marginal investment} = \text{Opportunity cost of marginal investment}$$

Wrong-view explanation

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  [King 1977; Auerbach 1979; Bradford 1981]

- C-corporations issue no equity or risky debt and choose investment to equalize marginal returns on retained earnings and payouts:

$$\text{Return to marginal investment} = \text{Opportunity cost of marginal investment}$$

$$(1-\tau_{DIV})(1-\tau_{INC})f'(PASTPROFITS - PAYOUTS) = (1-\tau_{DIV})r$$

Wrong-view explanation

- New view: marginal investments are funded out of retained earnings
  [King 1977; Auerbach 1979; Bradford 1981]

- C-corporations issue no equity or risky debt and choose investment to equalize marginal returns on retained earnings and payouts:

$$\text{Return to marginal investment} = \text{Opportunity cost of marginal investment}$$

$$(1-\tau_{DIV})\underbrace{(1-\tau_{INC})f'(PASTPROFITS-PAYOUTS)}_{r} = (1-\tau_{DIV})r$$

→ Dividend tax cuts have no effect on investment
(though corporate income tax cuts do)

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- New view: marginal investments are funded out of retained earnings
  [King 1977; Auerbach 1979; Bradford 1981]

- C-corporations issue no equity or risky debt and choose investment to equalize marginal returns on retained earnings and payouts:

$$\text{Return to marginal investment} = \text{Opportunity cost of marginal investment}$$

$$(1-\tau_{DIV})\underbrace{(1-\tau_{INC})f'(PASTPROFITS-PAYOUTS)}_{r} = (1-\tau_{DIV})r$$

→ Dividend tax cuts have no effect on investment
(though corporate income tax cuts do)

- Start-ups vs. mature corporations → Perhaps sizeable long-run effect

Wrong parameterization of traditional view

1. Low expected permanence (small effective dividend tax change)
   - 76% of investment has 7-year-or-shorter life
   - Requires counterfactual permanence?

2. Anticipation (small effective dividend tax change)
   - Contrary to stock prices [Auerbach Hassett 2007]
   - Requires exceeding expectations

3. Small dividend tax base (small dividend payout share) [Miller Scholes 1978]
   - Taxable dividends ≈ taxable capital gains
   - Requires lowering dividend rates below capital gains rate?

→ Even under the traditional view, may be difficult to implement an alternative dividend tax cut with substantially larger medium-run effects

Conclusion

- The 2003 dividend tax cut caused zero change in investment and employee compensation in a major part of corporate America
  - Contrasts with large real effects of many other fiscal policies
- Rejects joint claim that investment responded strongly to the cost of capital and that dividend taxes substantially affected the cost of capital
  - Consistent with new view of dividend taxation
  - May be difficult for future dividend tax cuts to have larger effects