Public Economics 230A
Lecture 2: Actual Capital Taxation – Investment

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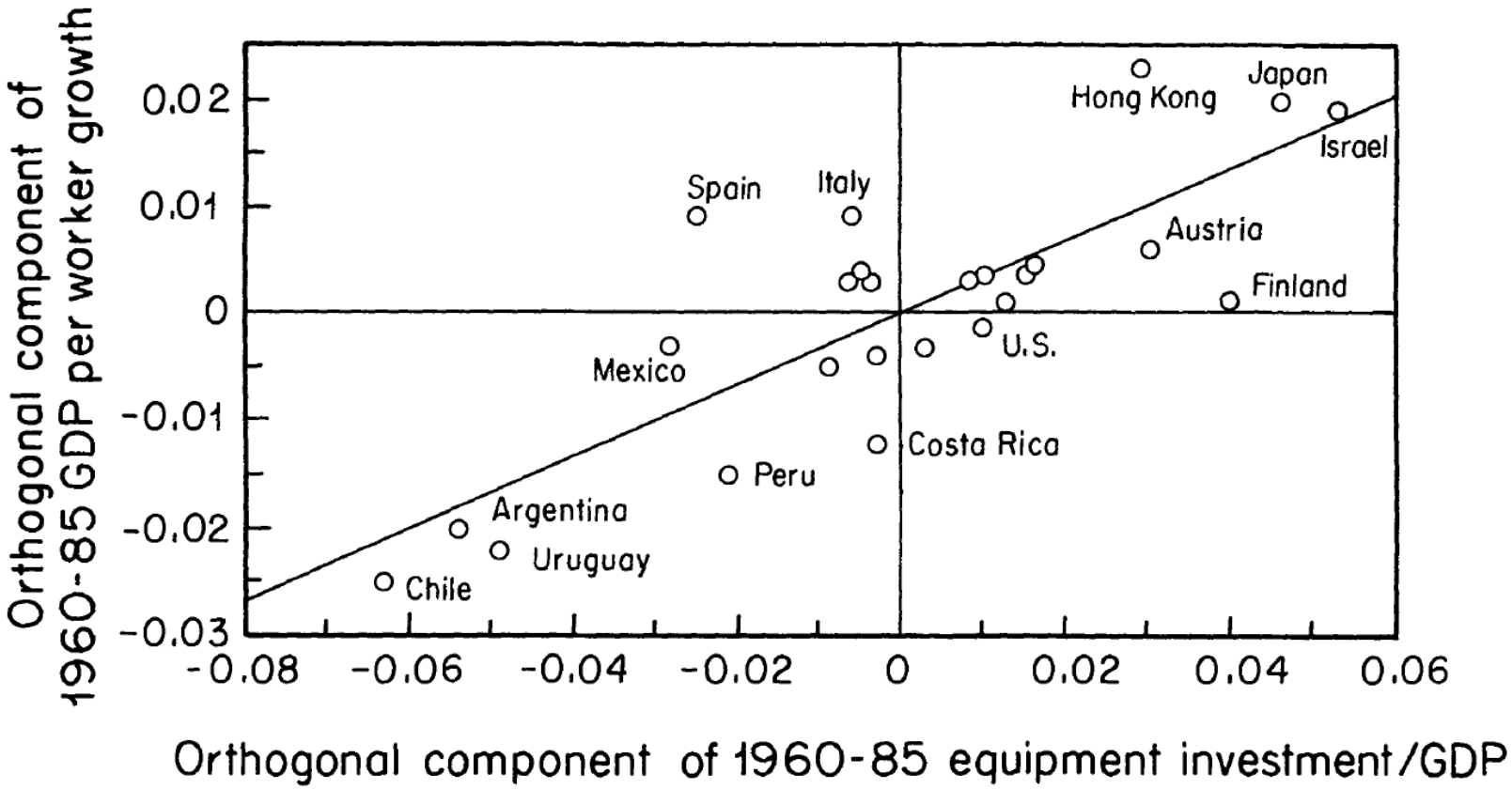
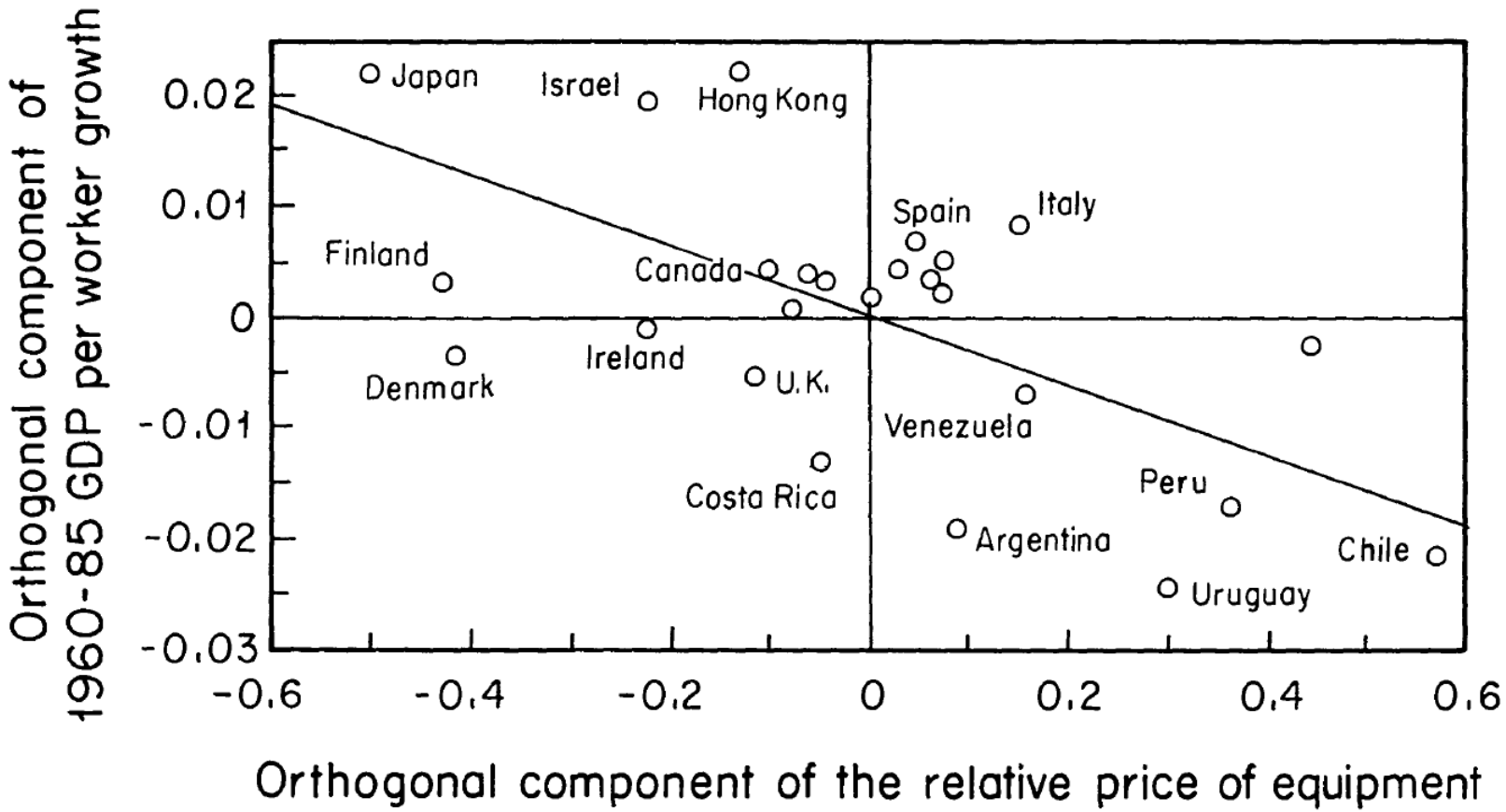
Motivation: Equipment investment and growth



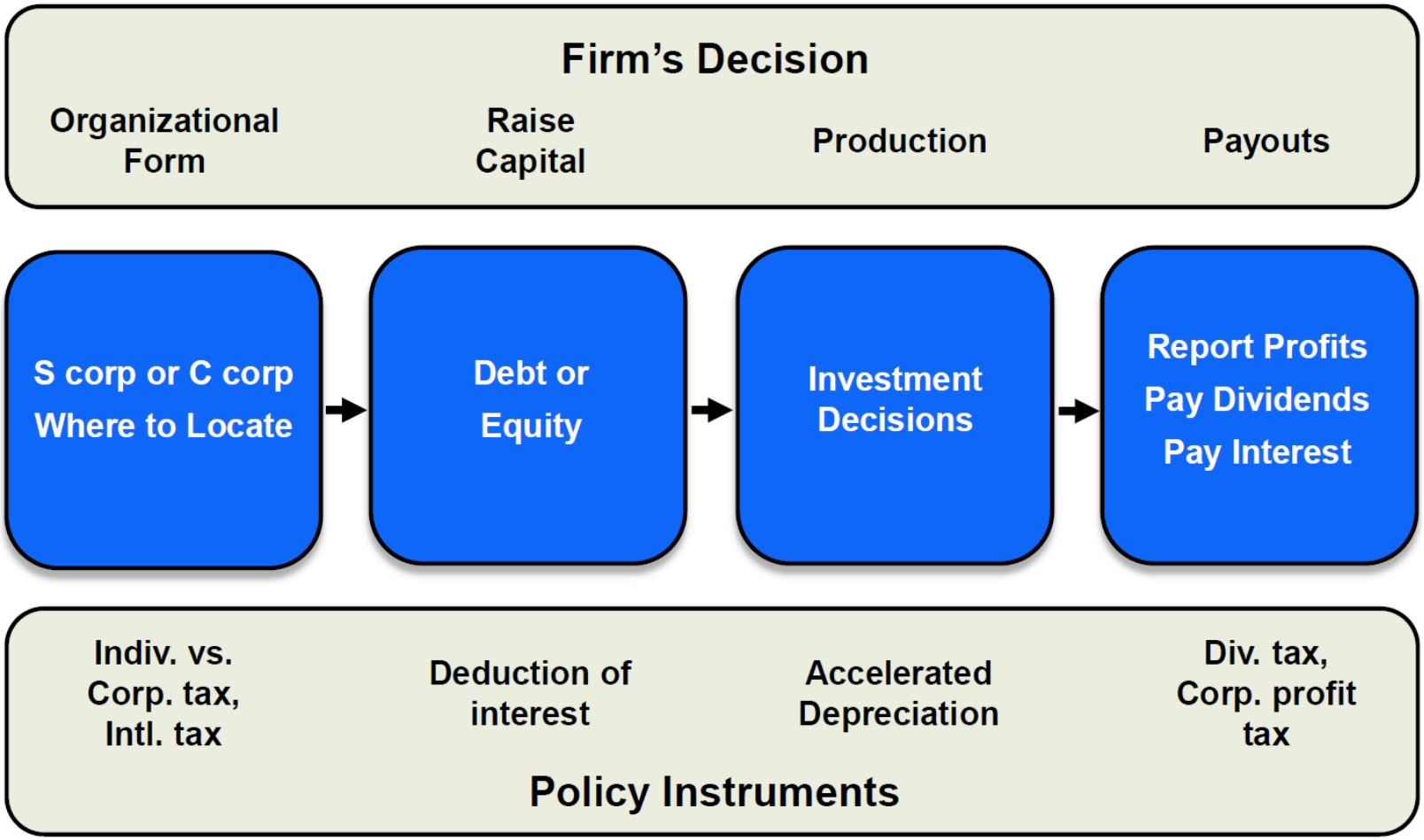
Source: De Long and Summers (1991)

Motivation: Equipment prices and growth



Source: De Long and Summers (1991)

Taxes and business investment



Source: Chetty and Bruich

How do taxes affect business investment?

- Theory: Cost of capital
- Evidence: Recent quasi-experiments
- Along the way: Departures from neoclassical considerations

Cost of capital (Hall-Jorgenson 1967)

- References: Hassett-Hubbard (2002), Auerbach (2002)
- Start with no taxes in general setup
  - Firm in period t deciding how much capital K_t to accumulate
  - Concave (gross) profit function (i.e. pre-taxes, post-deductions except depreciation deductions): $F(K_t)$
  - Price of capital goods: q_t
  - Depreciation rate (paid at purchase, before use): δ
  - Required rate of return: ρ

Cost of capital (Hall-Jorgenson 1967)

- NPV of a new machine (dK_{t+1}):

$$-q_t - \delta q_t + \frac{F'(K_{t+1}) + q_{t+1}}{1+\rho}$$

- Euler, equating marginal benefit to marginal cost at optimum:

$$F'(K_{t+1}) = q_t \left[(1+\delta)(1+\rho) - \frac{q_{t+1}}{q_t} \right]$$

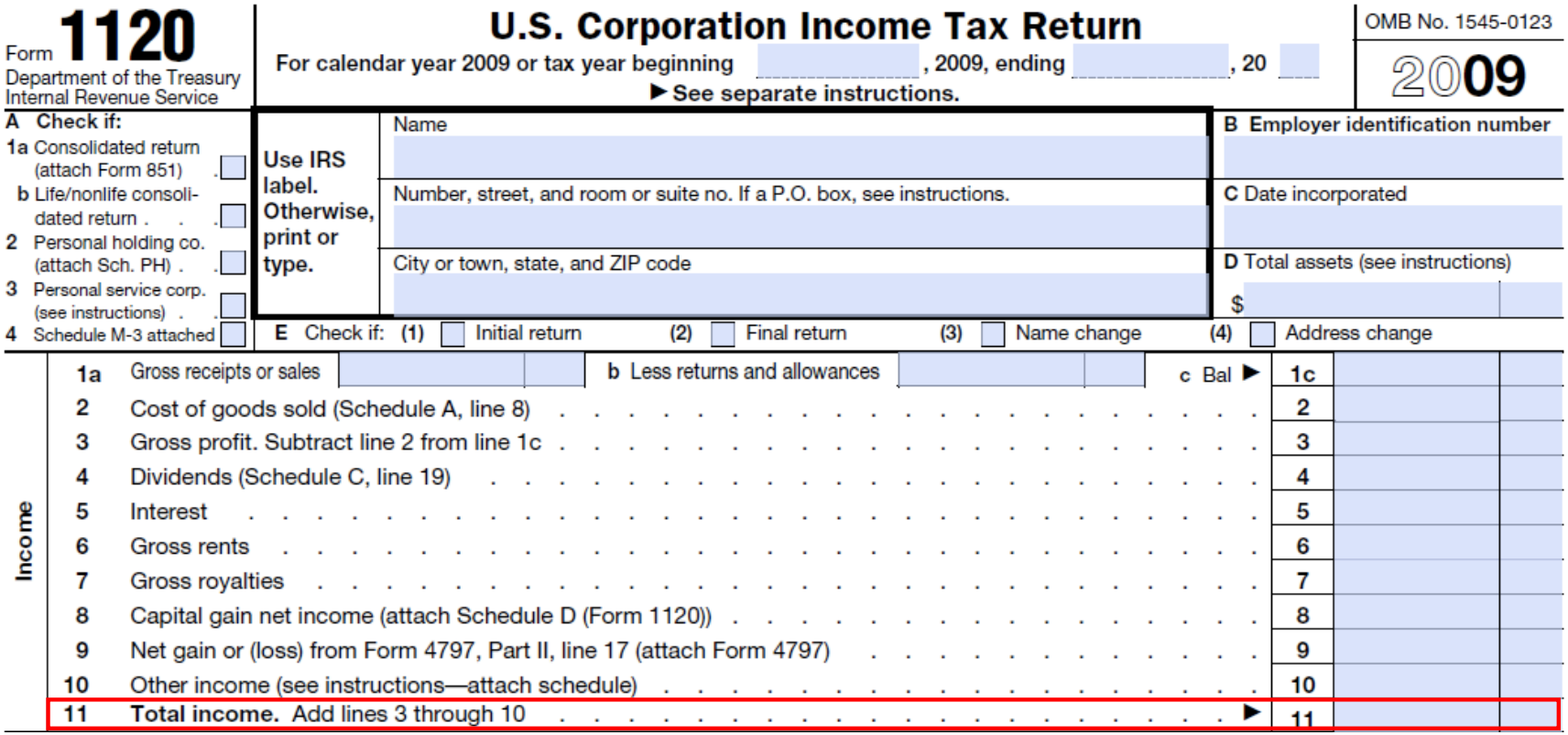
$$F'(K_{t+1}) \approx q_t \left[\rho + \delta - \frac{q_{t+1} - q_t}{q_t} \right]$$

- RHS: "user cost of capital"
- With constant investment prices ($q_{t+1} = q_t$), return on marginal unit of investment $F'(K_{t+1})/q_t$ equals required rate of return plus depreciation

Cost of capital (Hall-Jorgenson 1967)

- Add corporate income tax τ_t^{INC} (typically 35% in United States), which is assessed on gross profit (revenue minus deductions)

The U.S. corporate income tax form



Form **1120**
Department of the Treasury
Internal Revenue Service

U.S. Corporation Income Tax Return

For calendar year 2009 or tax year beginning , 2009, ending , 20

▶ See separate instructions.

OMB No. 1545-0123

2009

A Check if:
1a Consolidated return (attach Form 851)
b Life/nonlife consolidated return
2 Personal holding co. (attach Sch. PH)
3 Personal service corp. (see instructions)
4 Schedule M-3 attached

Use IRS label. Otherwise, print or type.

Name

Number, street, and room or suite no. If a P.O. box, see instructions.

City or town, state, and ZIP code

B Employer identification number

C Date incorporated

D Total assets (see instructions)
$

E Check if: (1) Initial return (2) Final return (3) Name change (4) Address change

Income						
	1a	Gross receipts or sales	b Less returns and allowances	c Bal ▶	1c	
	2	Cost of goods sold (Schedule A, line 8)			2	
	3	Gross profit. Subtract line 2 from line 1c			3	
	4	Dividends (Schedule C, line 19)			4	
	5	Interest			5	
	6	Gross rents			6	
	7	Gross royalties			7	
	8	Capital gain net income (attach Schedule D (Form 1120))			8	
	9	Net gain or (loss) from Form 4797, Part II, line 17 (attach Form 4797)			9	
	10	Other income (see instructions—attach schedule)			10	
	11	**Total income.** Add lines 3 through 10		▶	11	

The U.S. corporate income tax form

Deductions (See instructions for limitations on deductions.)	12	Compensation of officers (Schedule E, line 4) ▶			12	
	13	Salaries and wages (less employment credits)			13	
	14	Repairs and maintenance			14	
	15	Bad debts			15	
	16	Rents			16	
	17	Taxes and licenses			17	
	18	Interest			18	
	19	Charitable contributions			19	
	20	Depreciation from Form 4562 not claimed on Schedule A or elsewhere on return (attach Form 4562)			20	
	21	Depletion			21	
	22	Advertising			22	
	23	Pension, profit-sharing, etc., plans			23	
	24	Employee benefit programs			24	
	25	Domestic production activities deduction (attach Form 8903)			25	
	26	Other deductions (attach schedule)			26	
	27	**Total deductions.** Add lines 12 through 26 ▶			27	
	28	Taxable income before net operating loss deduction and special deductions. Subtract line 27 from line 11			28	
	29	**Less:** a Net operating loss deduction (see instructions)	29a			
		b Special deductions (Schedule C, line 20)	29b		29c	
ments	30	**Taxable income.** Subtract line 29c from line 28 (see instructions)			30	
	31	**Total tax** (Schedule J, line 10)			31	

Cost of capital (Hall-Jorgenson 1967)

- Add corporate income tax τ_t^{INC}, which is assessed on gross profit (revenue minus deductions)

- Add NPV of depreciation deductions per dollar of investment in t:

$$\Gamma_t = \sum_{z=t}^{\infty} (1+r)^{-(z-t)} \tau_t^{INC} D_{z-t}, \text{ where } \sum_{z=t}^{\infty} D_{z-t} = 1$$

- To the extent $r > 0$ (i.e. there is discounting and inflation) and/or depreciation deductions are back-loaded (i.e. for long-lived assets), depreciation deductions are less valuable

- New Euler / cost-of-capital:

$$F'(K_{t+1}) = q_t \frac{1-\Gamma_t}{1-\tau_t^{INC}} \left[\rho + \delta - \frac{q_{t+1}(1-\Gamma_{t+1}) - q_t(1-\Gamma_t)}{q_t(1-\Gamma_t)} \right]$$

When does the corporate income tax distort capital stocks?

- Consider case of "immediate expensing" (investment cost is fully deductible immediately):

$$D_0 = 1, D_{z-t} = 0 \; \forall \, (z - t) > 0$$

$$\implies \Gamma_t = \tau_t^{INC}$$

- Then with constant taxes, the corporate income tax can raise revenue but is nondistortionary:

$$F' \left(K_{t+1} \right) = q_t \left[\rho + \delta - \frac{q_{t+1} - q_t}{q_t} \right]$$

What is going on?

- When all costs are deductible, the corporate income tax is a tax on pure profit, and the K that maximizes pure profit $\pi(K)$ also maximizes $\left(1-\tau^{INC}\right)\pi(K)$
- In real world:
  - Tax law allows only small profitable firms to immediately expense ($D_0 < 1$)
  - Tax law does not allow full deductibility of financing costs $\rightarrow$ $\rho'\left(\tau^{INC}\right) > 0$ [unless interest deduction compensates on average]
- Suggests one should "*narrow* the base and *increase* the rate," exactly the opposite of traditional logic and path of actual corp. tax policies

The U.S. corporate income tax form

Deductions (See instructions for limitations on deductions.)						
	12	Compensation of officers (Schedule E, line 4) ▶			12	
	13	Salaries and wages (less employment credits)			13	
	14	Repairs and maintenance			14	
	15	Bad debts			15	
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From optimal capital stock to optimal investment

- Hall-Jorgenson pins down the optimal capital stock
- Predicts that when τ^{INC} changes, the capital stock K adjusts immediately and permanently to a new level
- Need adjustment costs for realistic investment paths
- Hall-Jorgenson assume ad hoc adjustment path. Later research endogenized adjustment paths (Summers 1981; Abel 1982; Feldstein 1982; Auerbach-Hines 1987; Auerbach 1989; Auerbach-Hassett 1992)

Auerbach-Hassett (1992)

- Quadratic adjustment costs, Cobb-Douglas, and linearize from firm's steady state $\rightarrow$ investment is high relative to lagged capital when:
  - Near-term costs of capital are low relative to their steady-state value
  - The firm's capital stock is low relative to its steady-state value

$$\frac{I_t}{K_{t-1}} = \left[\left(\frac{1-\mu_1}{\alpha}\right) + \delta\right] - \left(\frac{1-\mu_1}{\alpha c_K^*}\right) K_{t-1}^{\alpha} E_t \sum_{s=t}^{\infty} w_{s-t} c_s$$

$$c_s = \frac{q\left(1-\Gamma_s\right)\left(\rho + \delta + \frac{\Gamma_{s+1}-\Gamma_s}{1-\Gamma_s}\right)}{1-\tau_s^{INC}}$$

(see AH appendix or Yagan 2015 appendix for full description)

- High adjustment costs $\rightarrow$ slowly declining weights w_{s-t}

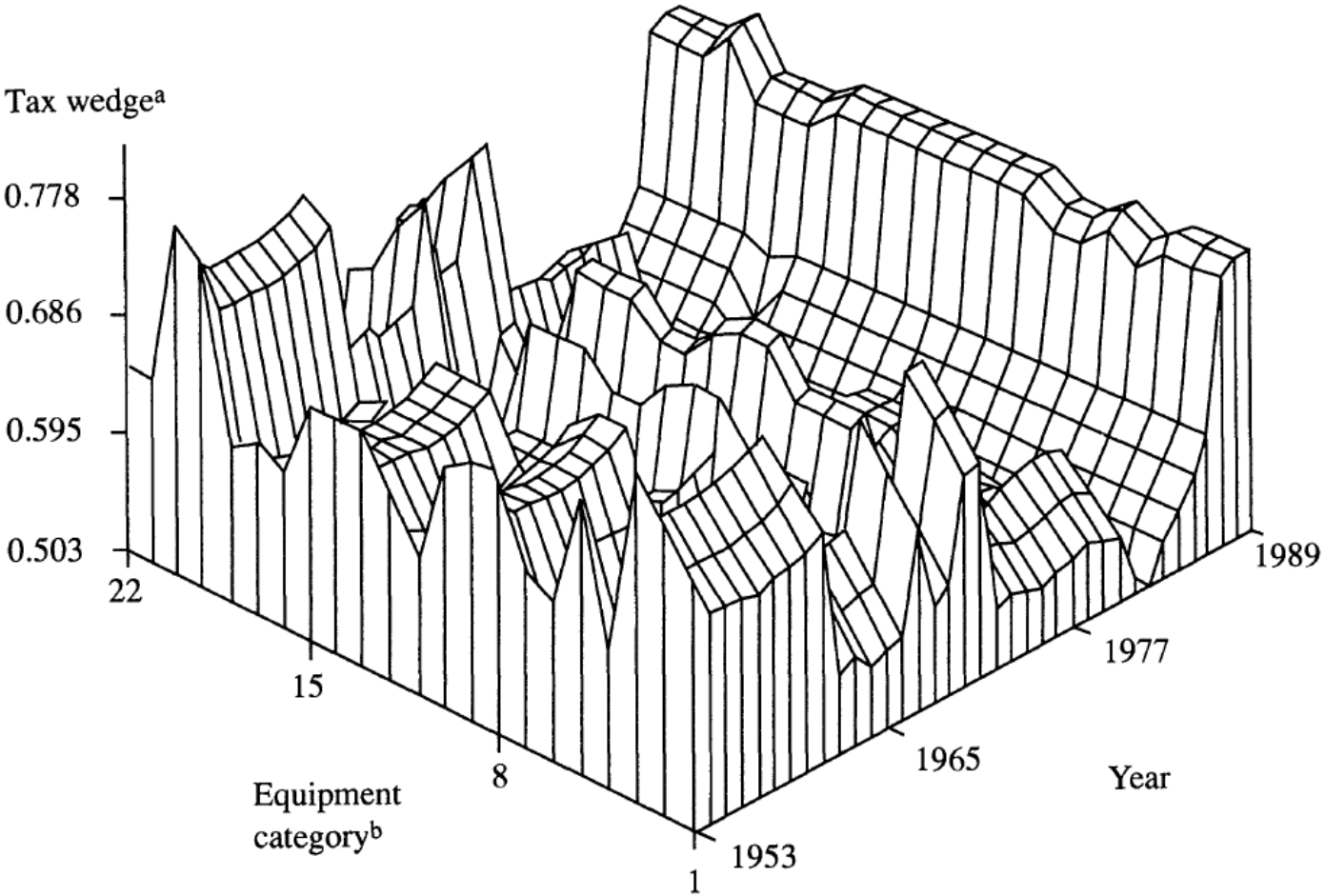
- Empirics: substantial effect of cost of capital on investment with substantial adjustment costs, but data reject model ($F(K)$ curvature α outside Cobb-Douglas feasible range $(0,1)$)

Cummins-Hassett-Hubbard (1994)

- Natural experiment idea: Estimate effect of tax reforms on investment by exploiting cross-sectional heterogeneity across firms in their cost-of-capital impacts, driven by asset length

Cummins-Hassett-Hubbard (1994)

Figure 2. After-Tax Cost of One Dollar of Equipment Investment, 1953–89



Source: Authors' calculations based upon data from the Bureau of Economic Analysis.
a. The tax wedge is calculated from Γ, which is the sum of the present value of tax savings from depreciation allowances and the investment tax credit. Higher values for $(1-\Gamma)$ correspond to higher after-tax costs of investing.
b. See table 2 for BEA classifications.

Cummins-Hassett-Hubbard (1994)

- Natural experiment idea: Estimate effect of tax reforms on investment by exploiting cross-sectional heterogeneity across firms in their cost-of-capital impacts, driven by asset length

- Estimate year by year ("simulated instruments"):

$$\left(\frac{I_t}{K_{i,t-1}}\right) - \widehat{\left(\frac{I_t}{K_{i,t-1}}\right)} = \mu_i + \beta\left(C_{it} - \widehat{C_{it}}\right) + \varepsilon_{it}$$

- Finds large and significantly negative coefficients in tax-reform years, with implied cost-of-capital elasticity of investment equal to -0.66, $\sim$10x previous estimates

- Caveat: Method assumes no substitutability across asset types, and Caballero (1994 comment) did not replicate

Accelerated depreciation (House-Shapiro 2008)

- For long-lived capital goods, a temporary increase in the amount that can be immediately expensed $D_0 \rightarrow$ strong incentives to accelerate investment
- Major tool to stimulate investment: 30%-50% "accelerated" ("bonus") depreciation 2001-2004 for assets with recovery periods ≤ 20 years
- Because of discounting, this created heterogeneous subsidies (change in $1 - \Gamma$) across asset classes
- Similar DD empirical strategy to Cummins-Hassett-Hubbard (1994), except across asset classes directly rather than across firms specializing in different asset classes

Recovery periods by asset type

TABLE 2—RECOVERY PERIODS AND DEPRECIATION METHODS BY TYPE OF CAPITAL

Type of capital	Recovery period, R (years)	Tax depreciation rate, $\hat{\delta}$ (percent)	Method
Tractor units for over-the-road use, horses over 12 years of age or racehorses with over 2 years in service	3	66.7	200 DB
Computers and office equipment; light vehicles, buses and trucks	5	40.0	200 DB
Miscellaneous equipment, office furniture, agricultural equiment	7	28.6 or 21.4	200 DB or 150 DB
Water transportation equipment (vessels and barges); single-purpose agricultural structures	10	20.0 or 15.0	200 DB or 150 DB
Radio towers, cable lines, pipelines, electricity generation and distribution systems, "land improvements," e.g., sidewalks, roads, canals, drainage systems, sewers, docks, bridges, engines and turbines	15	10.0	150 DB
Farm buildings (other than single purpose structures), railroad structures, telephone communications, electric utilities, water utilities structures including dams, and canals	20	7.5	150 DB
Nonresidential real property (office buildings, storehouses, warehouses, etc.)	39	2.6	SL

Note: Tax depreciation methods are 200 percent declining balance (200 DB), 150 percent declining balance (150 DB), and straight line (SL).

Source: House-Shapiro (2008)

Subsidy from accelerated depreciation

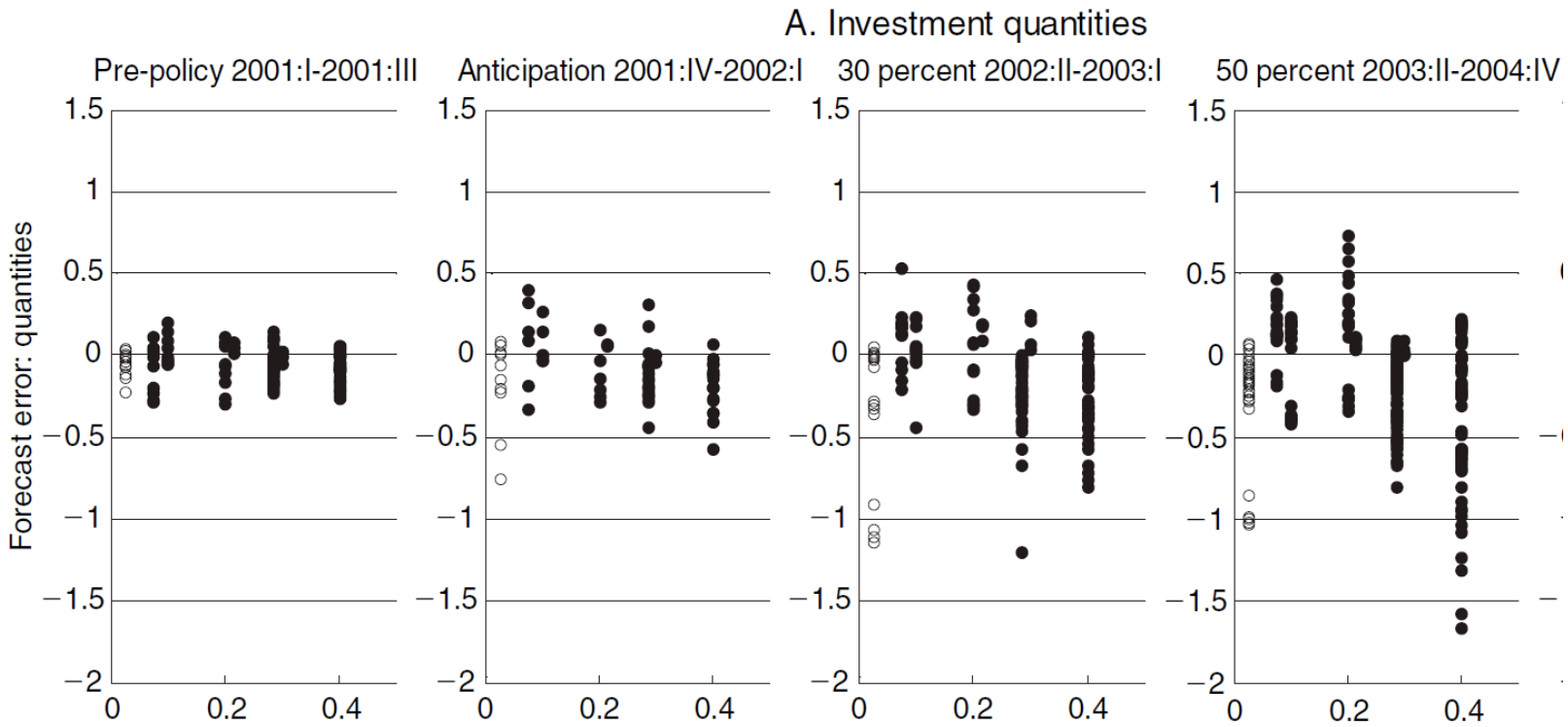
TABLE 3—QUANTIFYING DEPRECIATION ALLOWANCES

Recovery period	Nominal interest rate = 0.03			Nominal interest rate = 0.05			Nominal interest rate = 0.07		
	$\lambda^m = 0$	$\lambda^m = 0.3$	$\lambda^m = 0.5$	$\lambda^m = 0$	$\lambda^m = 0.3$	$\lambda^m = 0.5$	$\lambda^m = 0$	$\lambda^m = 0.3$	$\lambda^m = 0.5$
Panel A: Present value of depreciation allowances: $\lambda^m + (1 - \lambda^m) z^m$									
3 years	0.972	0.981	0.986	0.955	0.968	0.977	0.939	0.957	0.969
5 years	0.949	0.964	0.975	0.918	0.943	0.959	0.890	0.923	0.945
7 years	0.927	0.949	0.964	0.884	0.919	0.942	0.846	0.892	0.923
7 years (150DB)	0.914	0.939	0.957	0.863	0.904	0.932	0.818	0.872	0.909
10 years	0.896	0.927	0.948	0.837	0.886	0.919	0.786	0.850	0.893
10 years (150DB)	0.878	0.915	0.939	0.811	0.868	0.905	0.752	0.826	0.876
15 years	0.824	0.877	0.912	0.733	0.813	0.867	0.659	0.761	0.829
20 years	0.775	0.842	0.887	0.667	0.767	0.833	0.582	0.708	0.791
Panel B: Tax subsidy due to the bonus depreciation allowance, percent									
3 years	0.0	0.26	0.44	0.0	0.42	0.70	0.0	0.57	0.95
5 years	0.0	0.48	0.79	0.0	0.76	1.26	0.0	1.01	1.69
7 years	0.0	0.68	1.13	0.0	1.06	1.77	0.0	1.40	2.33
7 years (150DB)	0.0	0.80	1.33	0.0	1.25	2.08	0.0	1.64	2.73
10 years	0.0	0.96	1.60	0.0	1.47	2.45	0.0	1.91	3.18
10 years (150DB)	0.0	1.11	1.86	0.0	1.70	2.83	0.0	2.19	3.65
15 years	0.0	1.58	2.64	0.0	2.34	3.89	0.0	2.93	4.88
20 years	0.0	2.00	3.33	0.0	2.87	4.78	0.0	3.51	5.85

Source: Authors' calculations based on statutory MACRS recovery schedules, 0.3425 corporate tax rate, and 0.2975 distribution tax rate.

Source: House-Shapiro (2008)

Result: Relative increase in long-lived investment



Source: House-Shapiro (2008)

Accelerated depreciation (House-Shapiro 2008)

- Clearest finding: Large increase in investment, on average monotonically related to subsidy
- Interpretation: Very elastic investment supply (cf. Goolsbee 1998) and high internal adjustment costs
- Questions:
  - Why do investment effects persist after 2004?
  - What is the implied cost-of-capital elasticity of investment?

Accelerated depreciation (Zwick-Mahon 2014)

- House-Shapiro: Only friction to intertemporal optimization is internal adjustment cost
- Huge and contentious corporate finance literature (starting with Fazzari-Hubbard-Petersen 1988): Firms face financing constraints (a liquidity effect)
- Zwick-Mahon: Accelerated depreciation has large effect on financing constraints $\rightarrow$ perhaps explains effects on investment, rather than intertemporal substitution

Accelerated depreciation (Zwick-Mahon 2014)

- House-Shapiro's modest subsidies: accelerated depreciation increases depreciation deductions (and thus lowers tax payments) now at expense of future deductions (and thus higher tax payments) $\rightarrow$ modest subsidy (0.75-2% for five-year property) due to discounting
- Financing: Firm must pay up front for machine that pays off over time
- Financing constraint acts like high discount rate: Cash now is very valuable relative to cash later
- Accelerated depreciation generates large effective subsidy if firm is constrained

Large reduction in current taxes

Table 2: Regular and Bonus Depreciation Schedules for Five Year Items

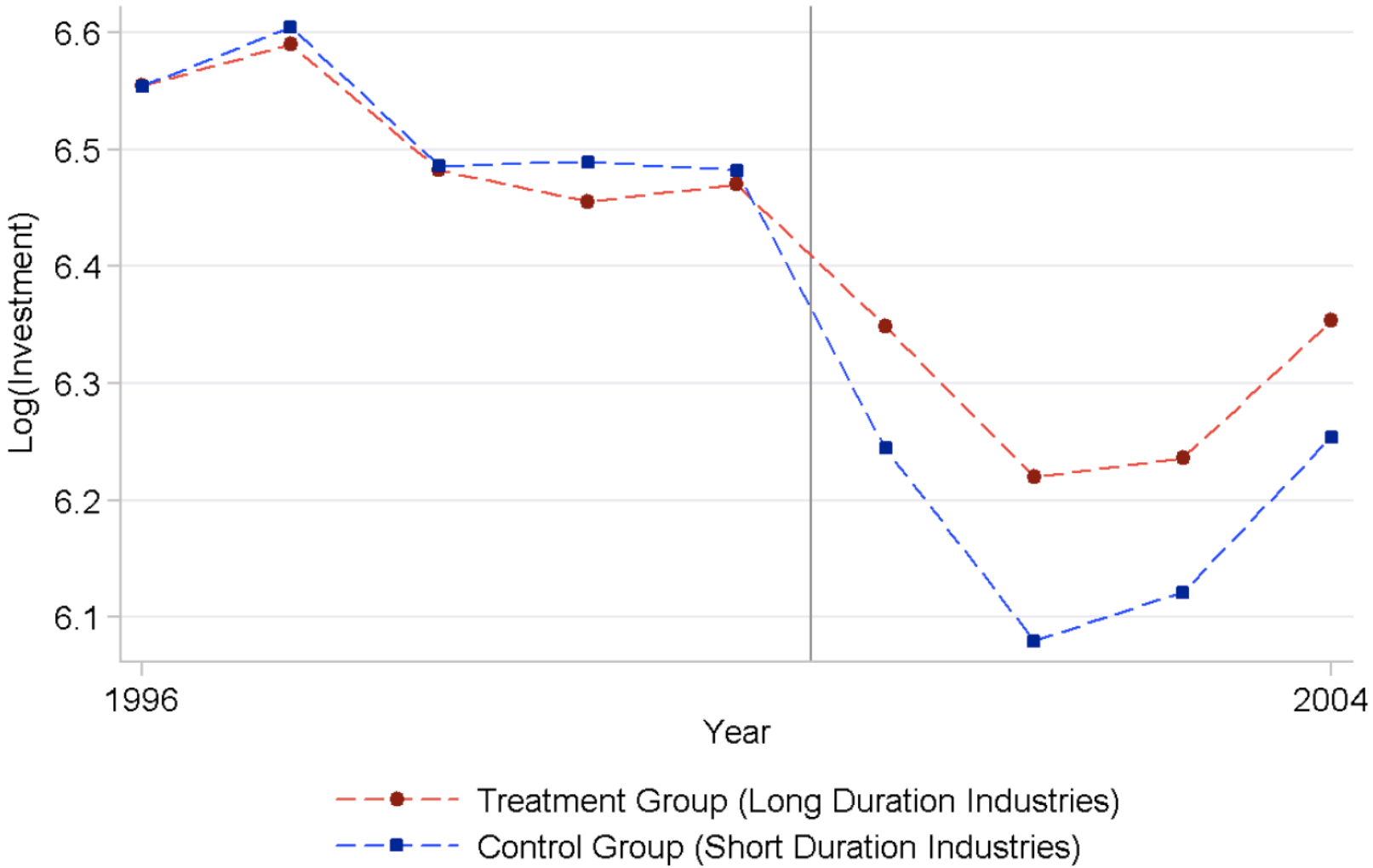
Normal Depreciation							
Year	0	1	2	3	4	5	Total
Deductions (000s)	200	320	192	115	115	58	1000
Tax Benefit ($\tau = 35\%$)	70	112	67.2	40.3	40.3	20.2	350
Bonus Depreciation (50%)							
Year	0	1	2	3	4	5	Total
Deductions (000s)	600	160	96	57.5	57.5	29	1000
Tax Benefit ($\tau = 35\%$)	210	56	33.6	20.2	20.2	10	350

Source: Zwick-Mahon (2014)

Accelerated depreciation (Zwick-Mahon 2014)

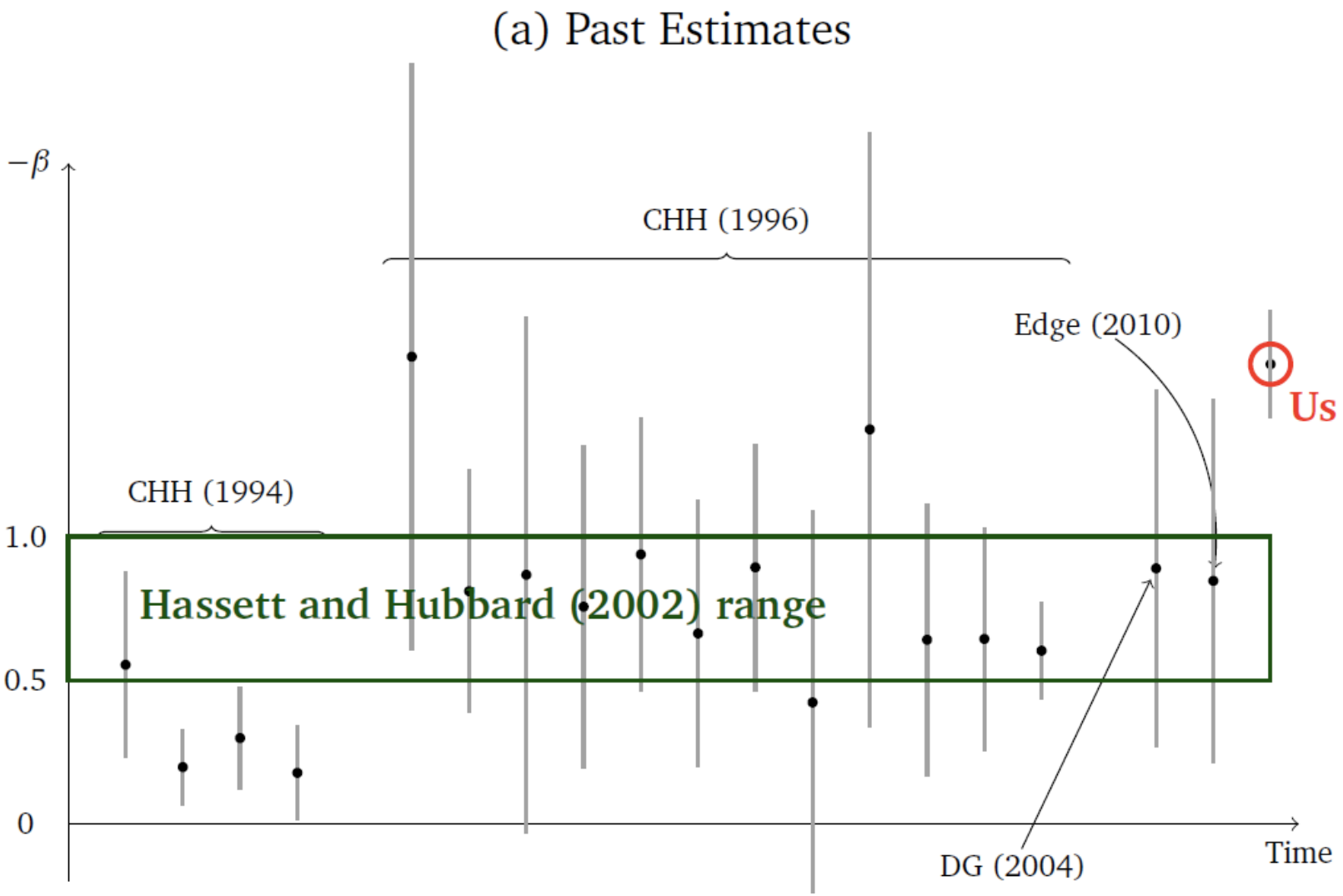
- Reduced-form effect: Compare investment across industries specializing in different asset types (computers vs. furnaces)
- Testing for financing constraints: Split firms by ex-ante markers of financing constraints (size, dividend payments, cash)
- Testing for interaction with managerial myopia: Split firms by "tax loss position," i.e. whether they have to wait to recoup tax benefits (thus loosening constraints next year but not this year)

Large reduced-form effect



Source: Zwick-Mahon (2014)

Reconciliation with past estimates: financing constraints?

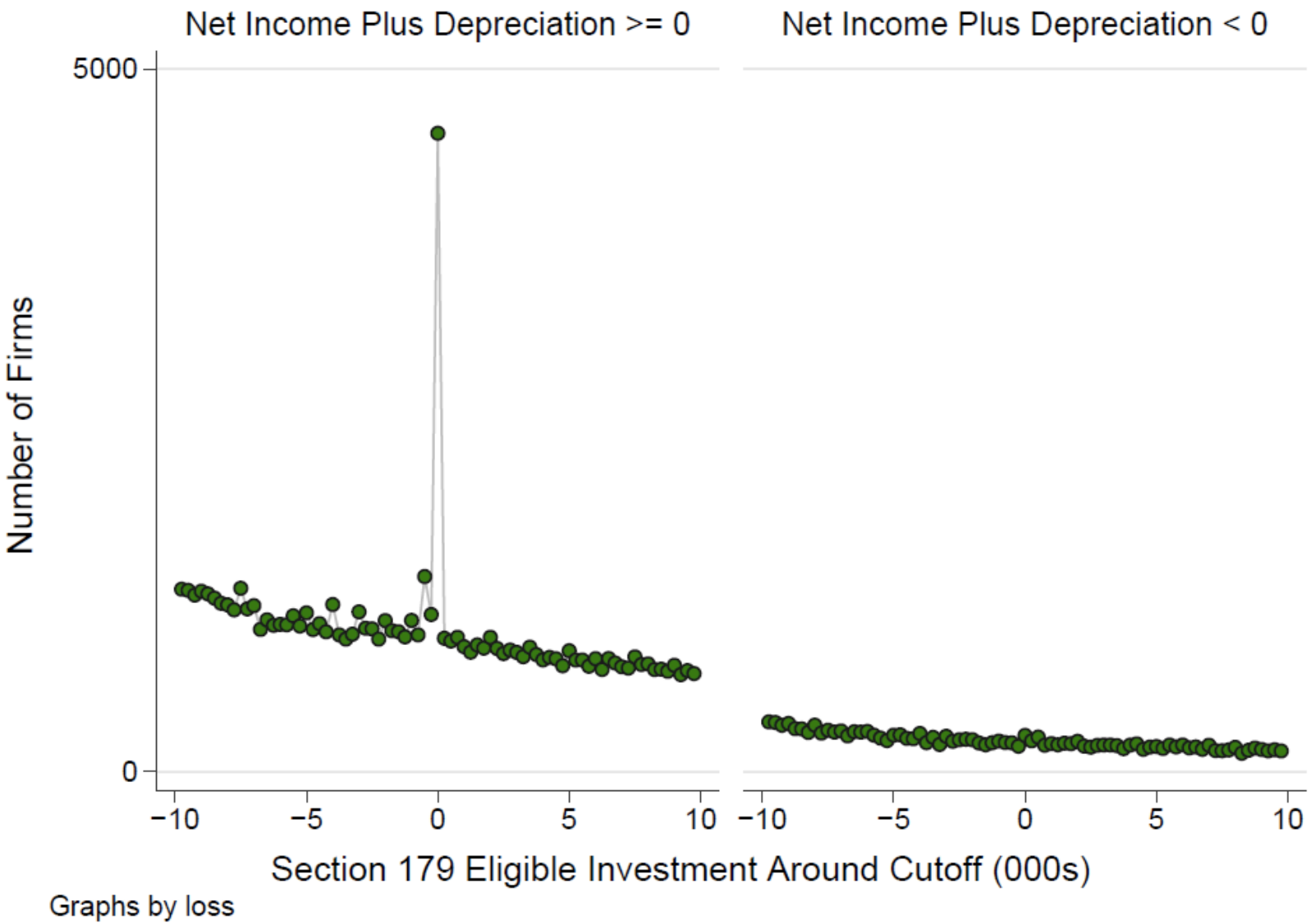


Source: Zwick-Mahon (2014)

Reconciliation with past estimates: financing constraints?

Source: Zwick-Mahon (2014)

Managerial myopia too?



Source: Zwick-Mahon (2014)

Accelerated depreciation (Zwick-Mahon 2014)

- Large absolute effect: 17-30% (again assuming no substitution across industries)
- Large cost-of-capital elasticity of investment (-1.7), using conventional cost-of-capital formulas
- Evidence of financing constraints and managerial myopia mattering for investment effects of taxes (implied discount rate of 97% for financially constrained firms!)

Payout taxes

- So far: considered only annual business income taxes
- United States has "double taxation": taxes can be assessed also when net-of-income-tax profits are distributed (paid out) to shareholders
  - Dividends: paid pro rata to all shareholders (taxed at dividend tax rate)
  - Share buyback: paid out to shareholders who sell (taxed at capital gains tax rate)
  - Retained earnings: effectively paid out when shareholder sells (taxed at accrued capital gains tax rate $<$ statutory capital gains tax rate)

Traditional view of dividend taxation

- Marginal investments are funded out of equity (Harberger 1962, 1966; Feldstein 1970; Poterba-Summers 1985) or risky debt (that can be converted to equity in bankruptcy)
  - Ex: start-ups (must issue equity in order to invest)
- In this case: τ^{DIV} is equivalent to τ^{INC}
- For compactness, ignore depreciation, uncertainty (so that $\rho = r$, fixed world interest rate), changing capital prices, and adjustment costs. Firm chooses K such that:

$$\left(1-\tau^{DIV}\right)\left(1-\tau^{INC}\right)F'(K) = r$$

New view of dividend taxation

- Marginal investments are funded out of retained earnings (King 1977; Auerbach 1979; Bradford 1981) or riskless debt (never converted to equity in bankruptcy)
  - Ex: Microsoft (abundant past profits from existing operations)

- In this case: permanent changes in τ^{DIV} affect value but not investment:

$$\left(1-\tau^{DIV}\right)\left(1-\tau^{INC}\right)F'(K)=\left(1-\tau^{DIV}\right)r$$

  - Firm retains cash for investment $(PASTPROFITS - PAYOUTS)$ up to point where $\left(1-\tau^{INC}\right)F'(PASTPROFITS - PAYOUTS) = r$, regardless of τ^{DIV}

  - Change in τ^{DIV} affects marginal return on investment (LHS) by the same factor that it changes the opportunity cost of investment (RHS)

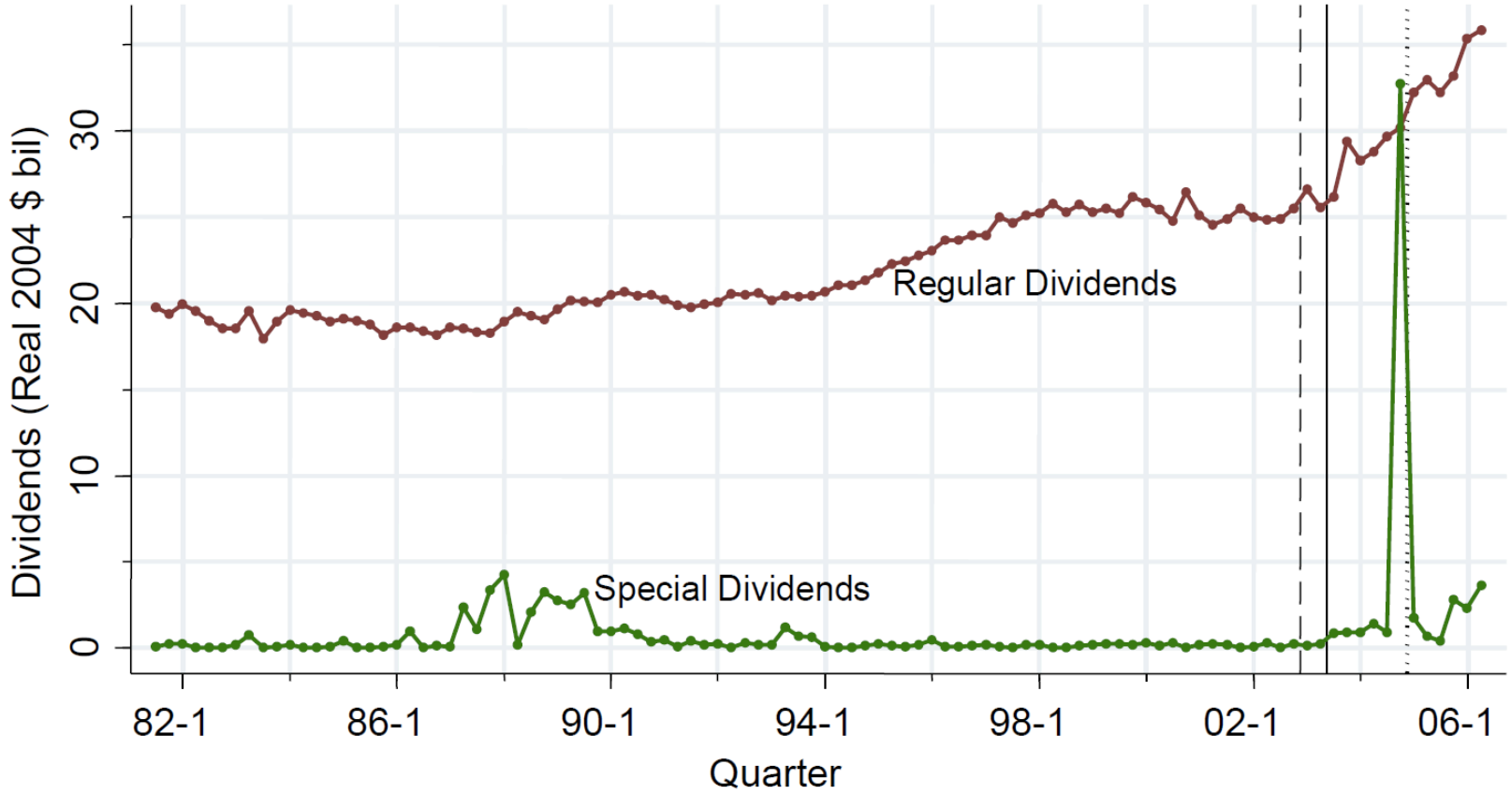
Evidence

- Original: inspect goodness of structural investment models (Poterba-Summers 1984) or cross-sectional behavior of investment and dividends (Auerbach-Hassett 2002)
- 2000s: Ignore investment and see what can be learned from payout behavior (Chetty-Saez 2005)
- 2010s: Quasi-experiments on investment (Yagan 2015)

Chetty-Saez (2005)

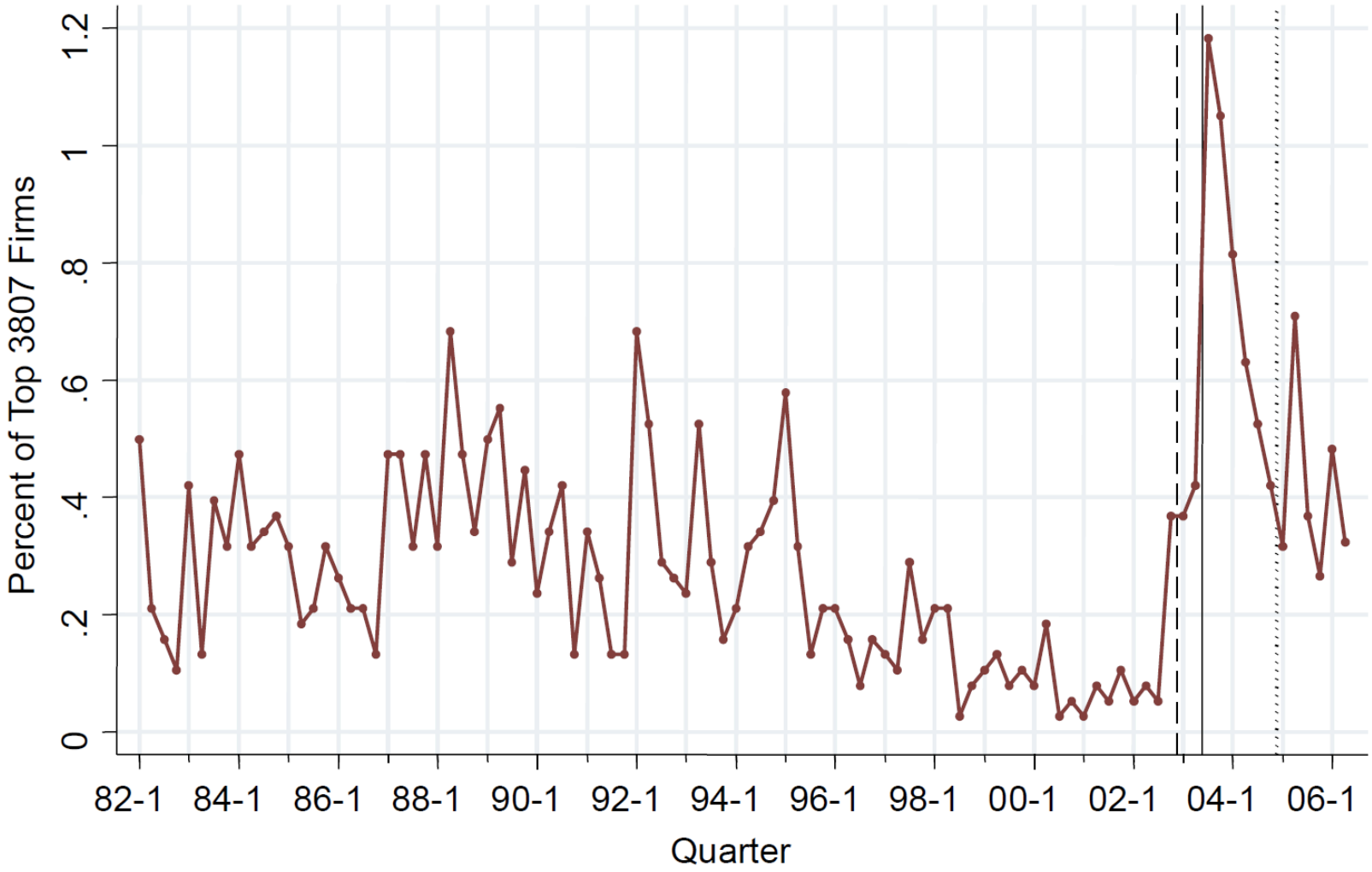
- Analyze 2003 dividend tax cut: reduced top τ^{DIV} from 38.6% to 15%
- Design:
  - Basic effect: single diff in aggregate time series (only possible because dividend initiations are high-frequency outcome, unlike investment)
  - Mechanisms: DD across firms
- Results:
  - No ringing endorsement of either traditional or new view
  - But suggests that agency considerations (imperfect monitoring of managers by owners) matter

Effect of 2003 dividend tax cut on dividend payouts



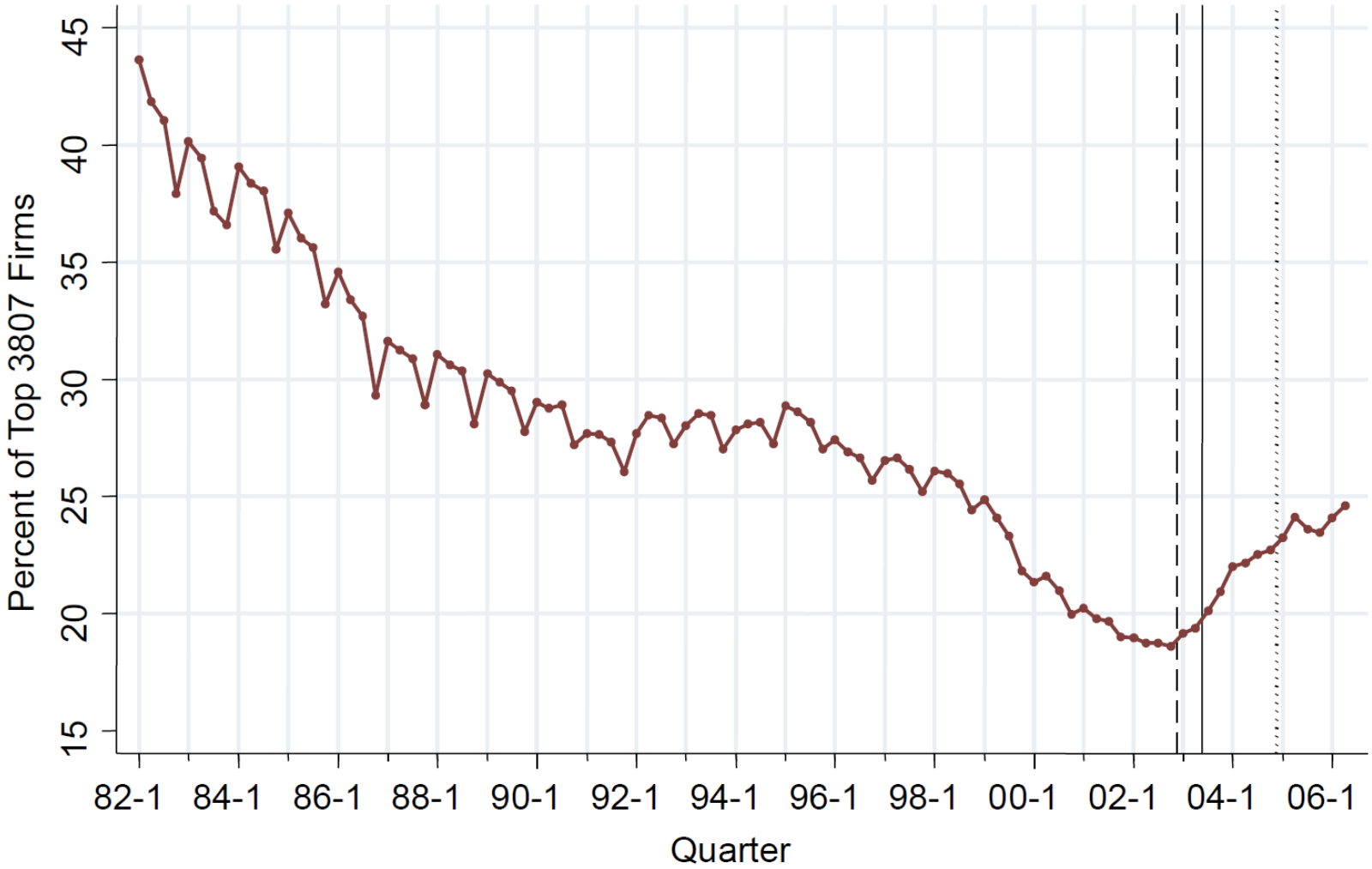
Source: Chetty-Saez (2005), updated through 2006

Effect of '03 div. tax cut on initiations of regular dividends



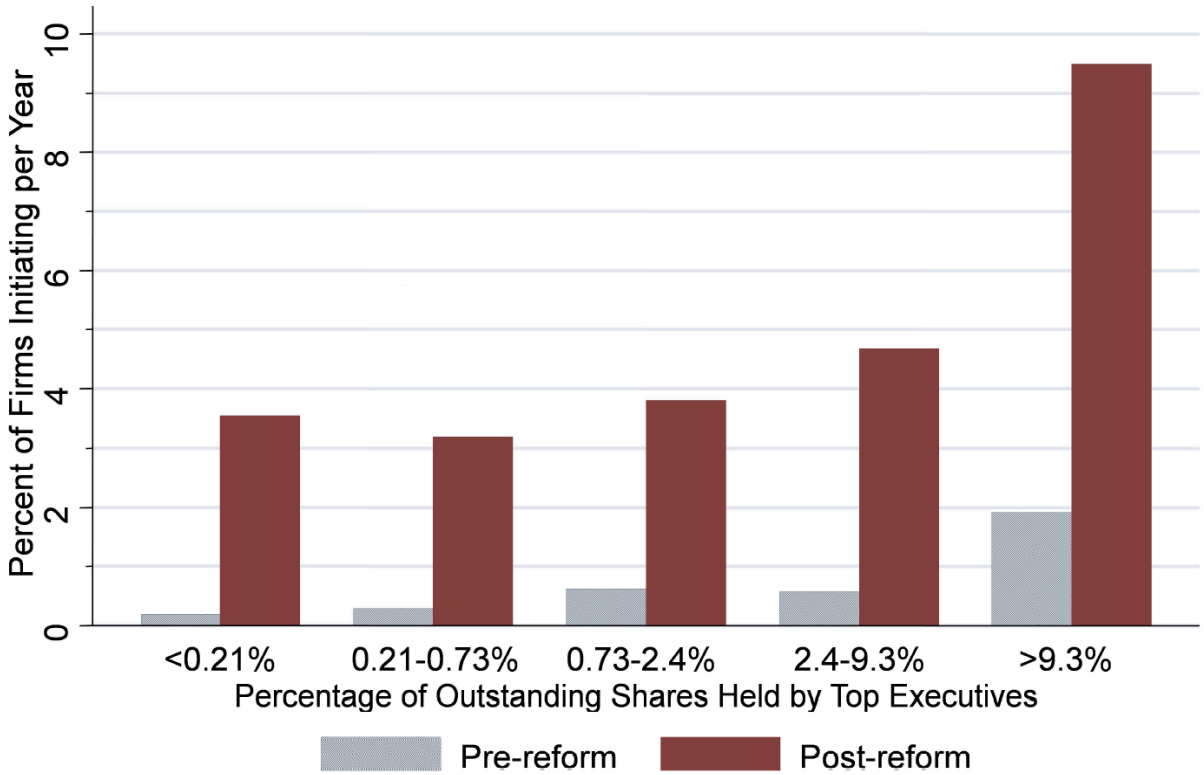
Source: Chetty-Saez (2005), updated through 2006

Effect of 2003 dividend tax cut on dividend-paying fraction



Source: Chetty-Saez (2005), updated through 2006

Heterogeneity suggestive of agency problems

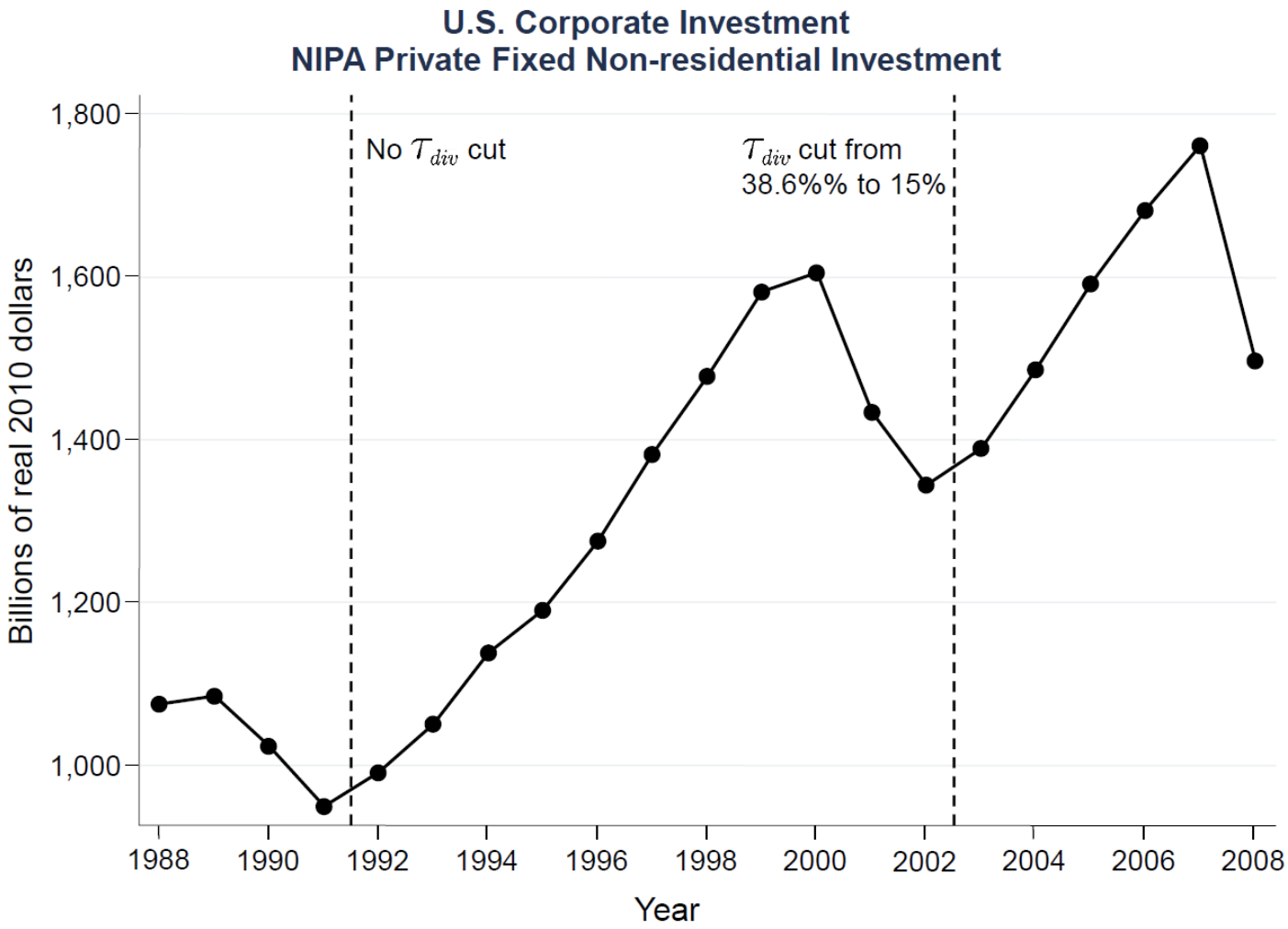


Source: Chetty-Saez (2005)

Yagan (2015)

- Chetty-Saez results consistent with positive, negative, or zero effect on investment
- Key challenge for identifying investment effects: must control for business cycle
- Design:
  - DD between C-corporations (directly affected by 2003 dividend tax cut) and S-corporations (not directly affected because never subject to dividend taxation)
- Results:
  - Zero effect that rejects basic traditional view
  - Alternative dividend tax cuts unlikely to have substantially larger effects (either new view is largely correct, or traditional view channels are inoperative in practice)

Must control for business cycle



Source: Yagan (2015)

Yagan (2015)

- 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 investors, one stock class
- Operate in same narrow industries and at the same scale throughout United States $\rightarrow$ common trends

Example: Retail hardware chains

- Largest hardware chain
- C-corporation

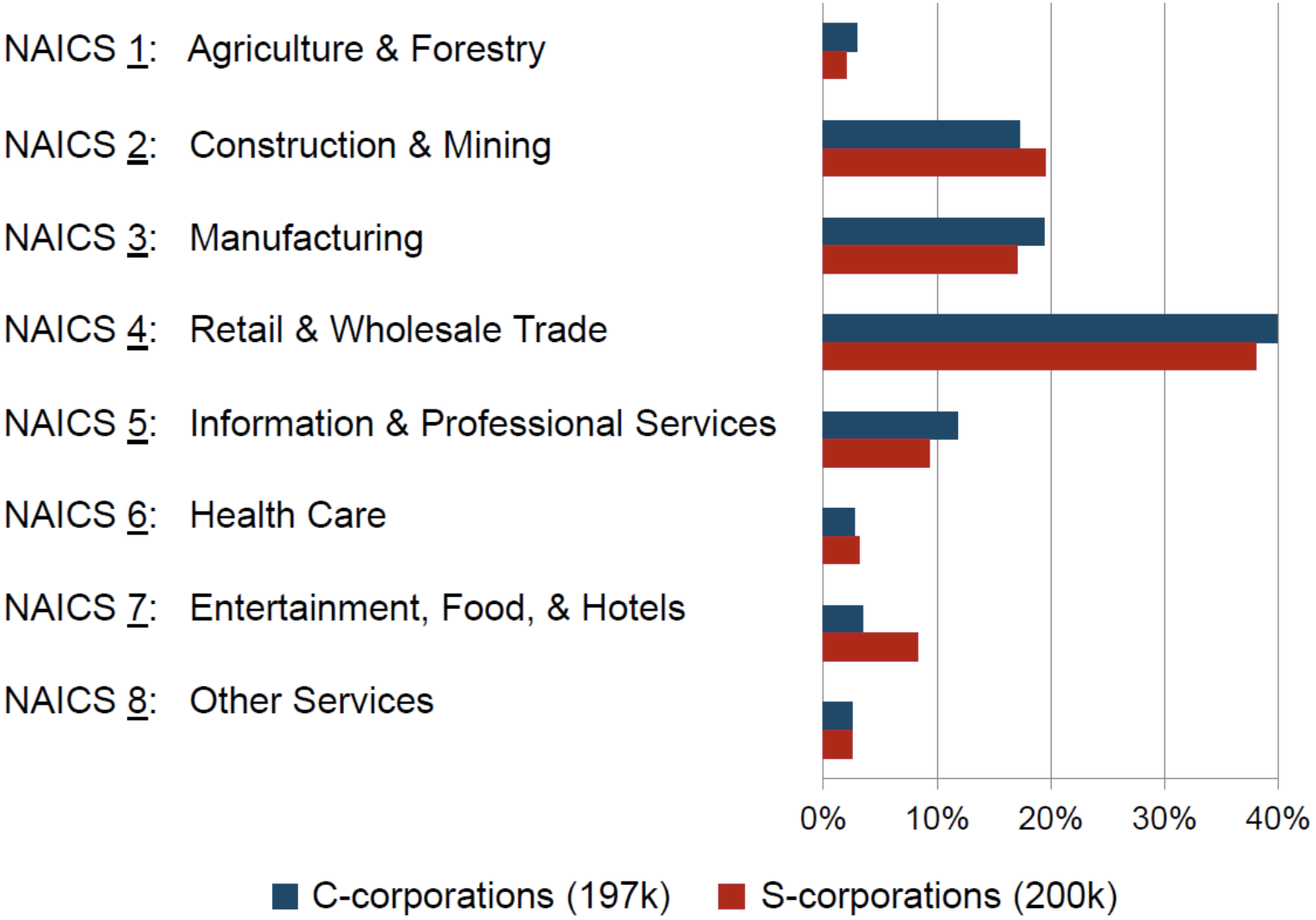
- Third-largest hardware chain
- S-corporation

Source: Yagan (2015)

Example: Retail hardware chains

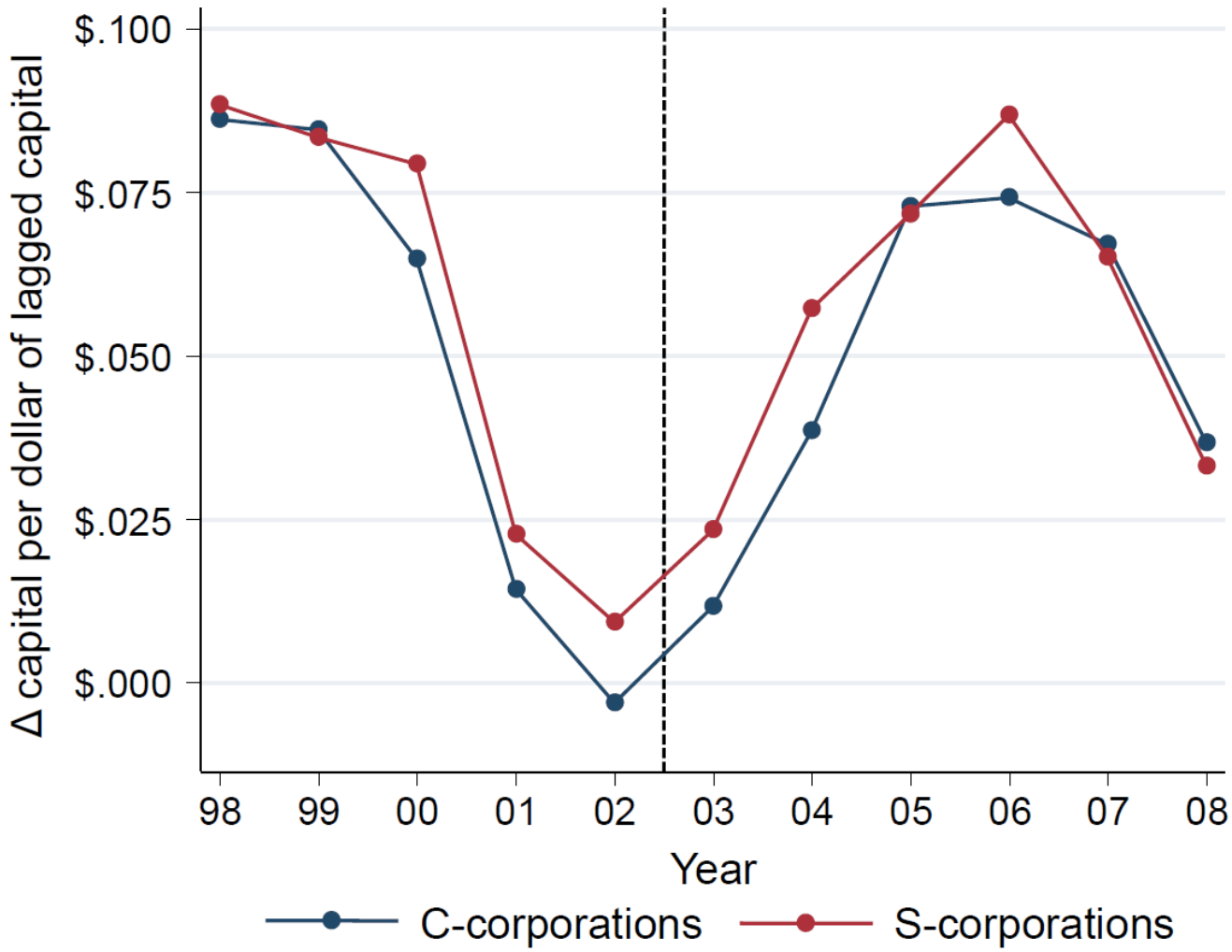
Source: Yagan (2015)

Balanced across industries and size in $1m-$1bn size range



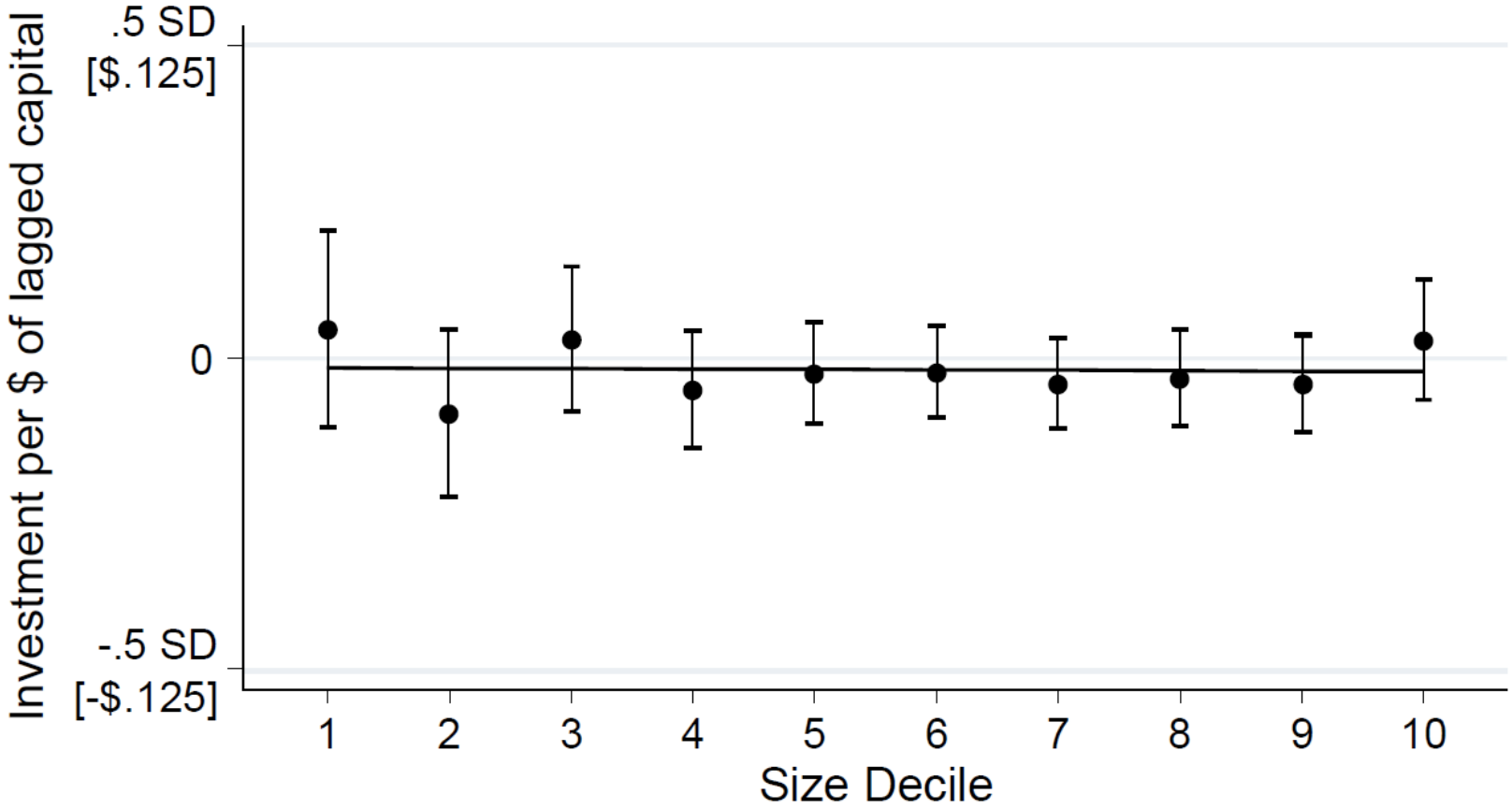
Source: Yagan (2015)

Zero effects on investment and employee compensation



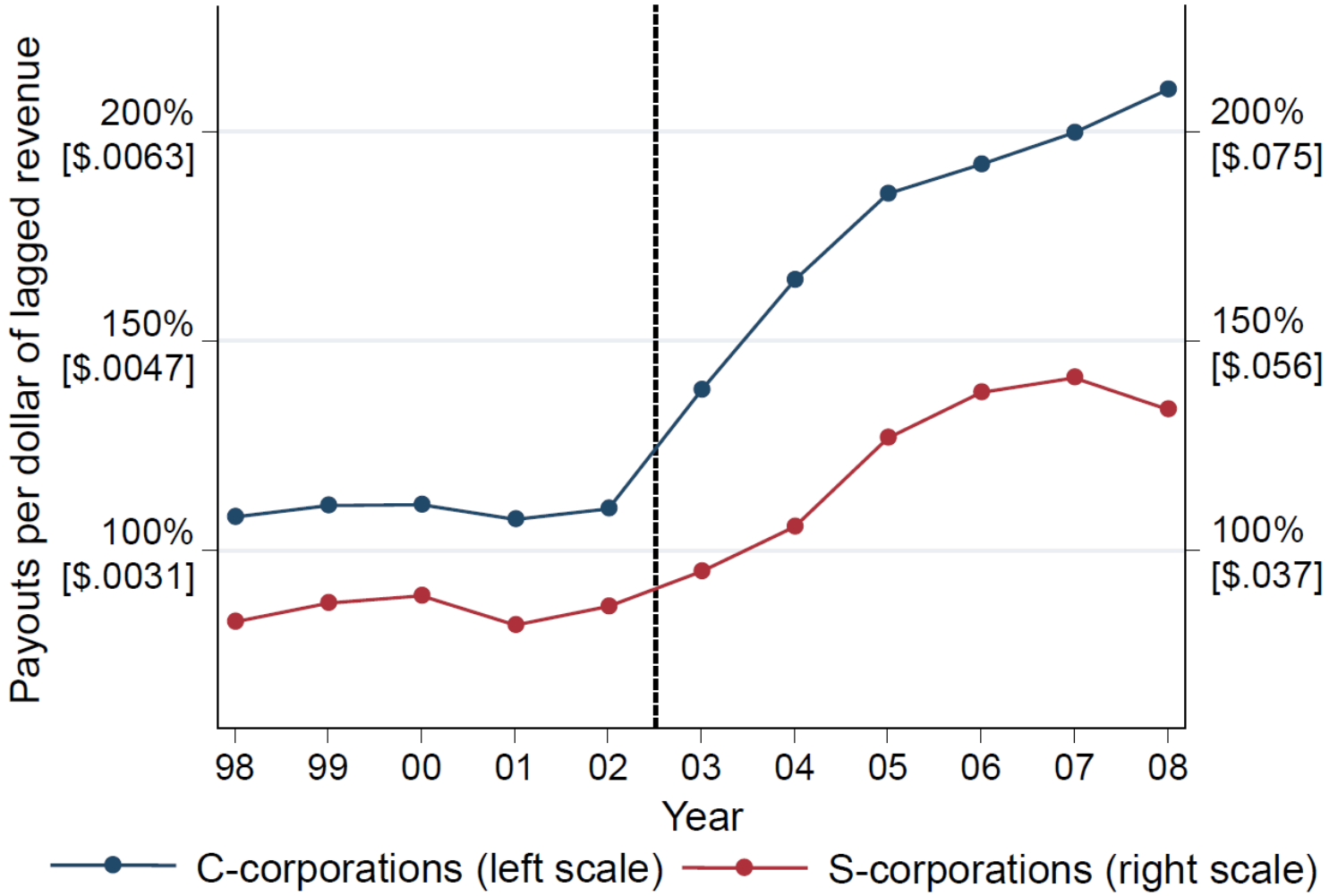
Source: Yagan (2015)

Effects constant across firm size distribution



Source: Yagan (2015)

Immediate financial response confirms relevance/salience



Source: Yagan (2015)

Yagan (2015)

- Net-of-dividend tax elasticity of investment: 0.00, with 0.08 95% confidence upper bound
- Traditional view prediction: $[0.21, 0.41]$ depending on cost-of-capital elasticity of investment (based on Hassett-Hubbard consensus range)

Yagan (2015)

- One explanation: New view is correct and most firms fund marginal investments out of retained earnings (e.g. median firm is 22 years old) $\rightarrow$ perhaps sizeable effect in very long-run when Facebook/Twitter take over U.S. production

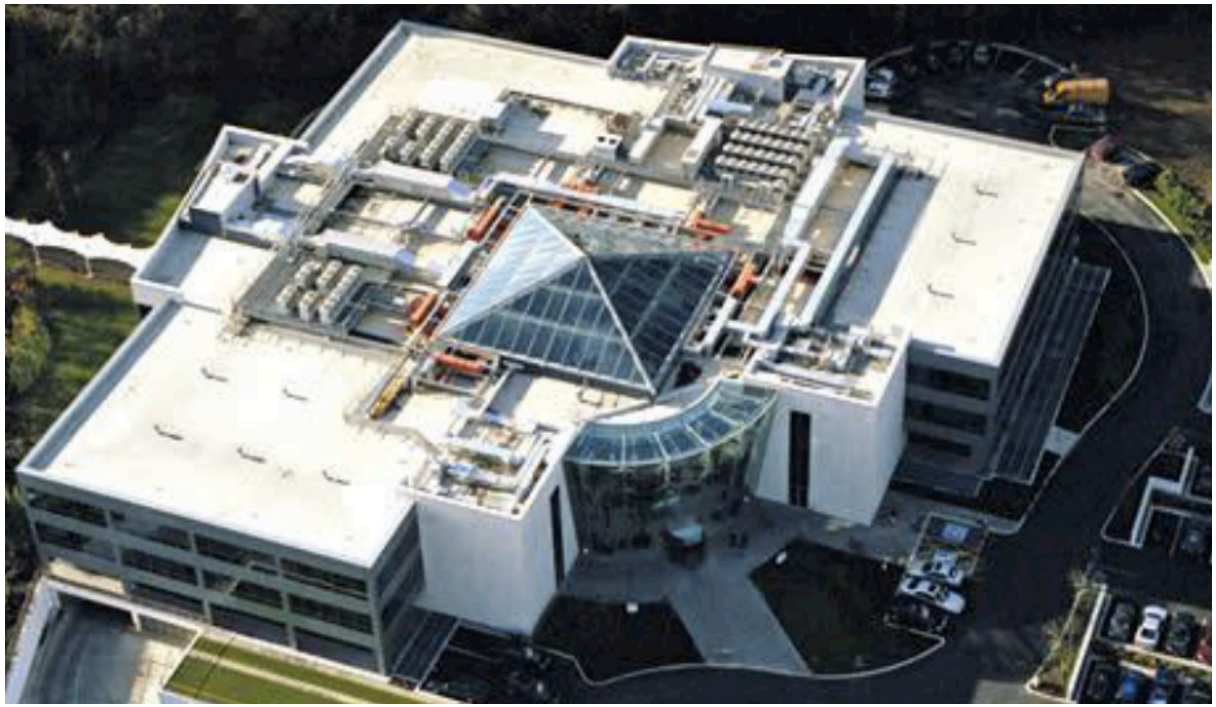
- Alternative: Traditional view is technically correct, but tax code features blocked effects
  - Ex: Low expected permanence (originally set to expire in 2009)
  - But most investment is in short-lived assets (so six years is effectively forever)
  - And governments never commit to long-run path for tax policy: dividend tax cut has largely outlasted many "permanent" reforms, and four of the G-7 countries have substantially changed their dividend tax rates in last 10 years

Effective tax rates on business income

- So far: Only way to lower all-in effective tax rate on business income is to change asset mix (from long-duration to short-duration), change organizational form (e.g. from C to S), change form and timing of payouts to shareholders

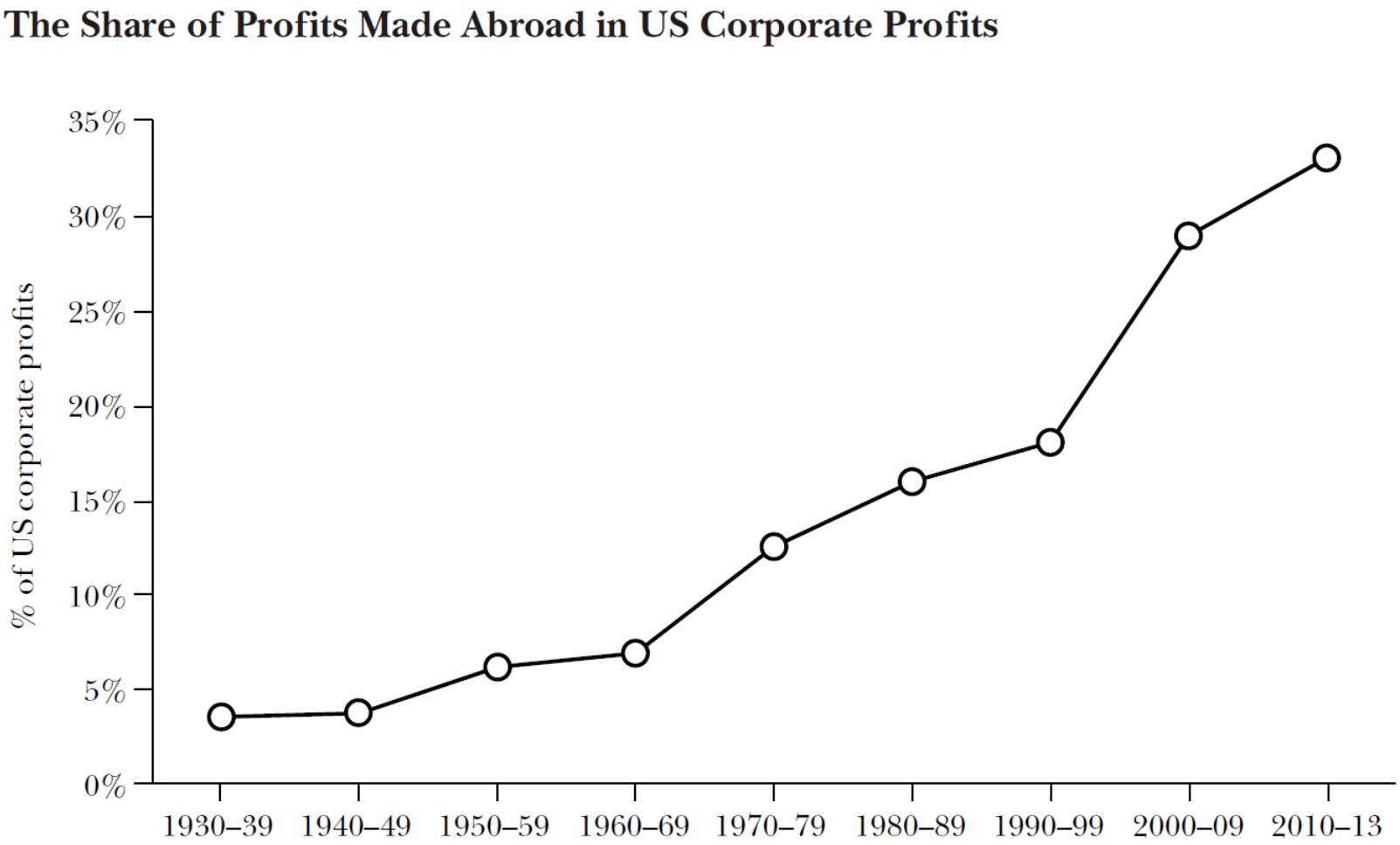
- Methods available to multinationals
  - Transfer pricing: Develop property in (or sell property at low price to) foreign subsidiary, which then leases it at high price to domestic parent $\rightarrow$ domestic parent enjoys cost deductions while foreign sub pays little tax on lease earnings
  - Earnings stripping: Domestic parent borrows heavily from foreign sub in Caymans $\rightarrow$ domestic parent enjoys interest deductions while foreign sub pays little tax on interest earnings

Ex: Microsoft's Irish sub Round Island Inc.



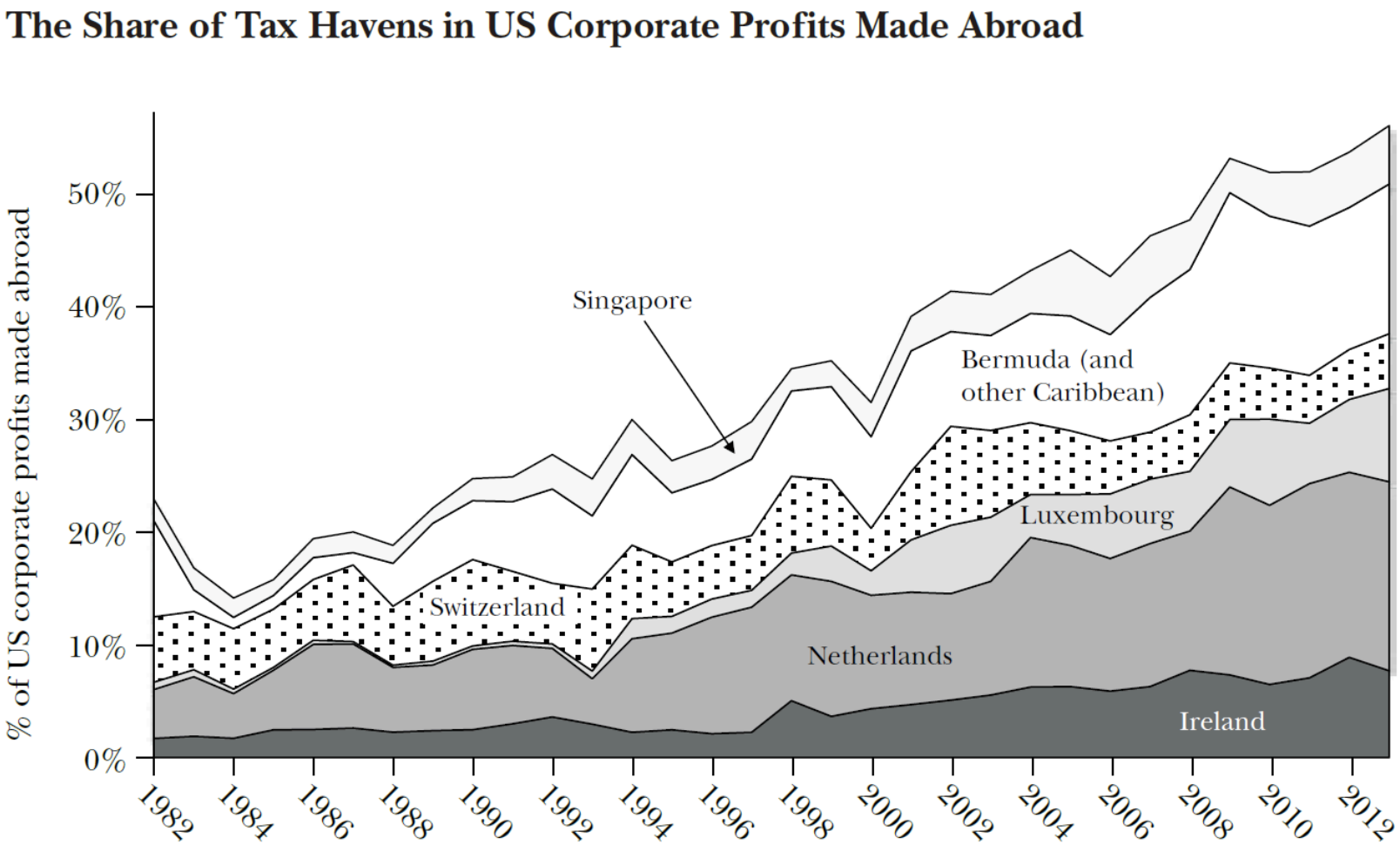
- In 2005: 1.5% of employees, 23% of assets
- Microsoft 2004 average tax rate: 33%
- Microsoft 2005 average tax rate: 26% due to "foreign earnings taxed at lower rates"

Rising importance of earnings booked abroad



Source: Zucman (2014)

Rising importance of earnings booked abroad



Source: Zucman (2014)

Worldwide taxation and repatriation

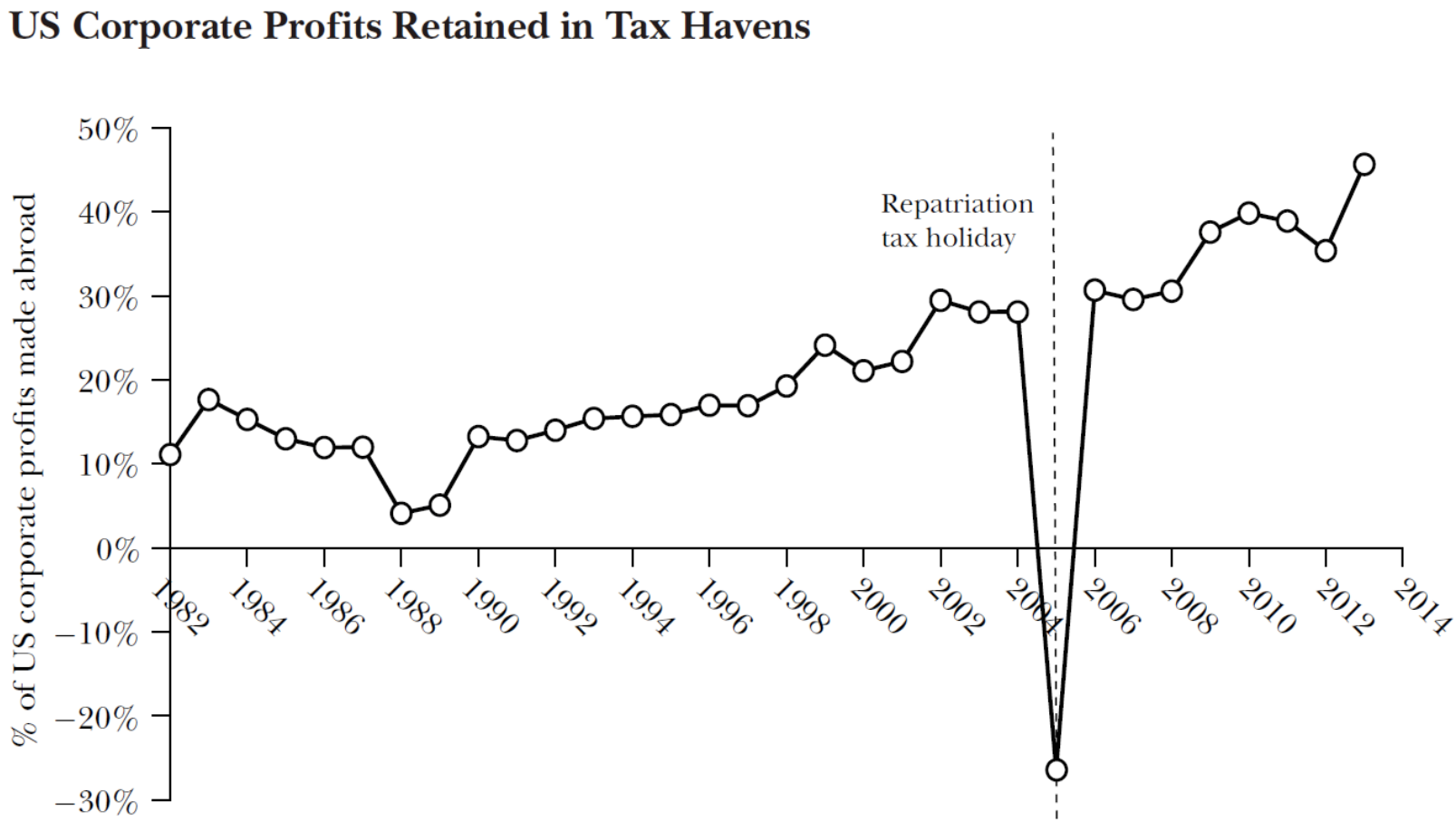
- U.S. worldwide tax: corporate earnings are taxable upon repatriation (sending profits back to U.S. parent) at 35%, less foreign taxes paid
- Hines-Rice (1994): Doesn't matter, firm avoids entire U.S. tax if it just invests abroad at r^* (fixed worldwide interest rate) and repatriates the earnings:

$$\sum_{T=1}^{\infty} \frac{r^* \left(1 - \tau^{INC}\right)}{\left[1 + r^* \left(1 - \tau^{INC}\right)\right]^T} = 1$$

- Crucial assumption: firms discount future at $r^* \left(1 - \tau^{INC}\right)$
- Summers (1987) survey of Fortune 200 CFOs: average discount rate of 17%

(see also Poterba-Summers 1995)

Sensitivity of repatriations to tax rate on repatriations



Source: Zucman (2014)

Desai-Foley-Forbes (2009)

- Tax holiday promoted to increase domestic investment. What did firms do with the repatriated funds?
- Design: compare investment changes across firms with different tax-haven profit concentration
- Findings: firms returned almost all money to shareholders, no direct increase in investment
- Intuition: firms can borrow against their foreign earnings, so little reason to be financially constrained in the first place

International considerations and policy

- Prescription from neoclassical cost-of-capital model: narrow base and then increase rate as much as you want
- Apparent policy consensus: leave base broad, lower the rate
- One rationalization: large perceived costs to corporations with rents moving headquarters abroad
- But are advocates trying to have it both ways?
  - "Don't tax corporations: capital is internationally mobile, so corporate taxes reduce U.S. capital accumulation, wages, and GDP!"
  - "But don't tax savings either: capital is *not* interntionally mobile, so savings taxes reduce U.S. capital accumulation, wages, and GDP!"
  - (Vice versa for Democrats)