Lecture 9: Corporate taxation

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Firms in tax policy

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  - e.g., "taxes harm business"
  - e.g., "corporations should pay their fair share"

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- **Extreme equity-efficiency trade-off**
  - Equities highly concentrated in top incomes
  - Investment decisions matter highly for growth

Opposite views in the debate

1. **Corporate taxes as tax on top incomes**
   - Equities highly concentrated in top incomes/top wealth
   - CIT to reduce tax avoidance on income tax
   - Dramatic increase in inequality fueled by untaxed corporate profit

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2. **Corporate taxes as inefficient tax on labour**
   - CIT largely shifted to workers
   - CIT hinders investment hence growth
   - Cutting CIT is efficient and benefit large shares of the population

Outline of the lecture

I. Institutions

1. What are corporations ?
2. Why corporate taxes ?
3. Fiscal facts

II. Incidence

1. Shareholder approach
2. Closed economy : Harberger model
3. Open economy case
4. Empirical evidence

III. Efficiency costs

1. Impact of corporate income tax
2. Impact of payout taxes

I. Institutions

1. What are corporations ?
2. Why tax firms ?
3. Typology of corporate taxation
4. Trends in firm taxation

What are corporations ?

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  - A *corporation* is a legal entity separate from the persons that form it
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- **Non corporate firms ("pass-through firms")**
  - Liability for non corporate firms is linked to firm's owners i.e., liable for any outstanding debt on their personal wealth

  $\Rightarrow$ Non-corporate firms subjected to personal income tax

Choice of organizational form

- **In the United States**
  1. *Sole proprietorship* : liable to personal income tax
  2. *Partnerships* : liable to personal income tax
  3. *Limited liability company (LLC)* : liable to personal income tax
  4. *S-corporations :* liable to personal income tax
  5. *C-corporations :* liable to CIT

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- **In France**
  1. *Société par action simplifiée (SAS)* : liable to CIT
  2. *Société à responsabilité limitée (SARL)* : liable to CIT
  3. *Société anonyme (SA)* : liable to CIT
  4. *Entreprise unipersonnelle à responsabilité limitée (EURL)* : liable to personal income tax
  5. *Société par actions simplifiée unipersonnelle (SASU)* : liable to CIT

Corporate taxation

1. **Taxes on firms' profits**
   - Corporate income tax (CIT)
   - Income tax on profit from pass-through firms
2. **After-tax profit distributed to individuals as payouts**
   - Dividends : taxed with personal income tax
   - Share repurchase : capital gains tax
   - Retained earnings : profits kept by the firm (taxed only by CIT)
3. **International tax provisions**
   - Transfer pricing
   - Tax havens

Why have corporation tax ?

1. **Corporation tax as a benefit tax**
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   - State insurance for 'too big to fail'
   - Other benefits (infrastructure, education, etc.)

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   - Similar problem with capital gains
   - Corporate taxation is a way to limit income tax avoidance

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3. **Taxation of pure profit or rents**
   - Returns that exceed the return to both labour and capital e.g., rent from extracting oil
   - Pure profit taxation does not distort investment decisions
   - Hence low efficiency cost of taxing rents

Corporate income tax (CIT)

- **CIT schedule**
  - Statutory corporation tax rate τ_{cit}
  - Corporate tax base $Y =$ [Revenues - Expenses]

$$CIT = \tau_{cit} Y - ITC - RTC$$

  - Revenues are sales of goods and services

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  - Equivalent to accelerated depreciation

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- **Research tax credit (RTC)**
  - RTC is based on R&D spending, and can lead to negative CIT (i.e., subsidy to R&D)

CIT tax base : expenses

1. **Current costs** C
   - compensation to employees
   - intermediate inputs

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   - Economic depreciation : capital investments lose value over time
   - Depreciation allowances are legally specified in CIT
     e.g., 5 years depreciation for computers
     e.g., 30 years for building

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3. **Financing costs (return on capital)**
   - Interest payments, I
   - Opportunity cost of equity, OCE

Corporate income tax systems

Income included in the tax base

1. **Full return to equity**
   - Tax base includes equity finance

$$Y = R - (C + Dep + I)$$

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3. **Economic rent**
   - Both debt and equity finance are deducted

$$Y = R - (C + Dep + I + OCE)$$

Corporate income tax systems

Relationship with personal income

1. **Classical system**
   - Tax liability of companies completely separated from tax liabilities of individual shareholders
   - No relief for distributed profits (dividends)
   - *"Double taxation" of dividends* : once through the corporation tax, once as income of the shareholders

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2. **Imputation system**
   - Shareholders receive credits for the corporation tax paid on distributed profit.
   - "Full imputation" means all the domestic corporation tax paid on distributed profits is credited to shareholders

Corporate income tax systems

Table 1 – Classical vs imputation system

	Classical	**Imputation**
Corporation		
Profits before tax	€1000	€1000
CIT 30%	€300	€300
Profits after tax	€700	€700
Shareholder		
Dividend income	€700	€700
Imputed CIT	-	€300
Taxable income	€700	€1000
Income tax 40%	€280	€400
Tax credit for CIT	-	€300
Net income	€420	€600
Total tax paid	€580	€400

Trends in corporate taxation

Trend 1 : Decrease in statutory corporate tax rates

- **Large cuts in the 1980s**

Ireland	from 45% to 10% in 1981
U.K.	from 50% to 35% in 1983-86
U.S.	from 50% to 38% in 1986
Sweden	from 57% to 30% in 1989-91

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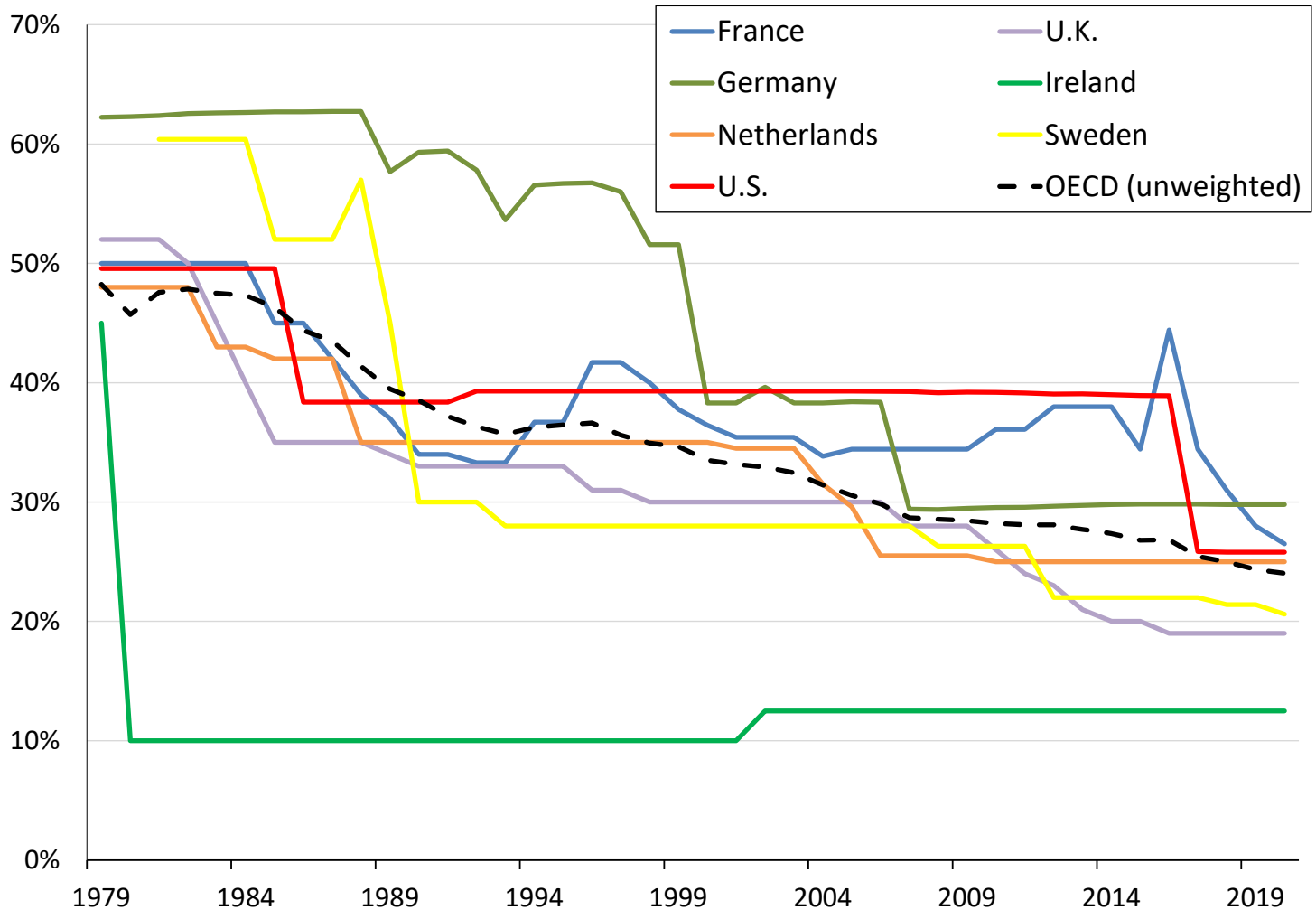
- **Recent cuts in statutory CIT**

U.K.	cut from 30% to 19% (back to 25% in 2023)
U.S.	cut from 35% to 21% (Tax Cuts and Jobs Act, TCJA 2017)
France	cut from 33.3% to 25% by 2022
Sweden	cut from 26% to 22% in 2013, 20.4% in 2021
Belgium	cut from 29.6% to 25% in 2021

Figure 1 – Statutory Corporate Tax Rates



Source : Devereux, Griffith and Klemm (2002) ; OECD.stat from 2005 to 2018 ; planned changes up to 2021.

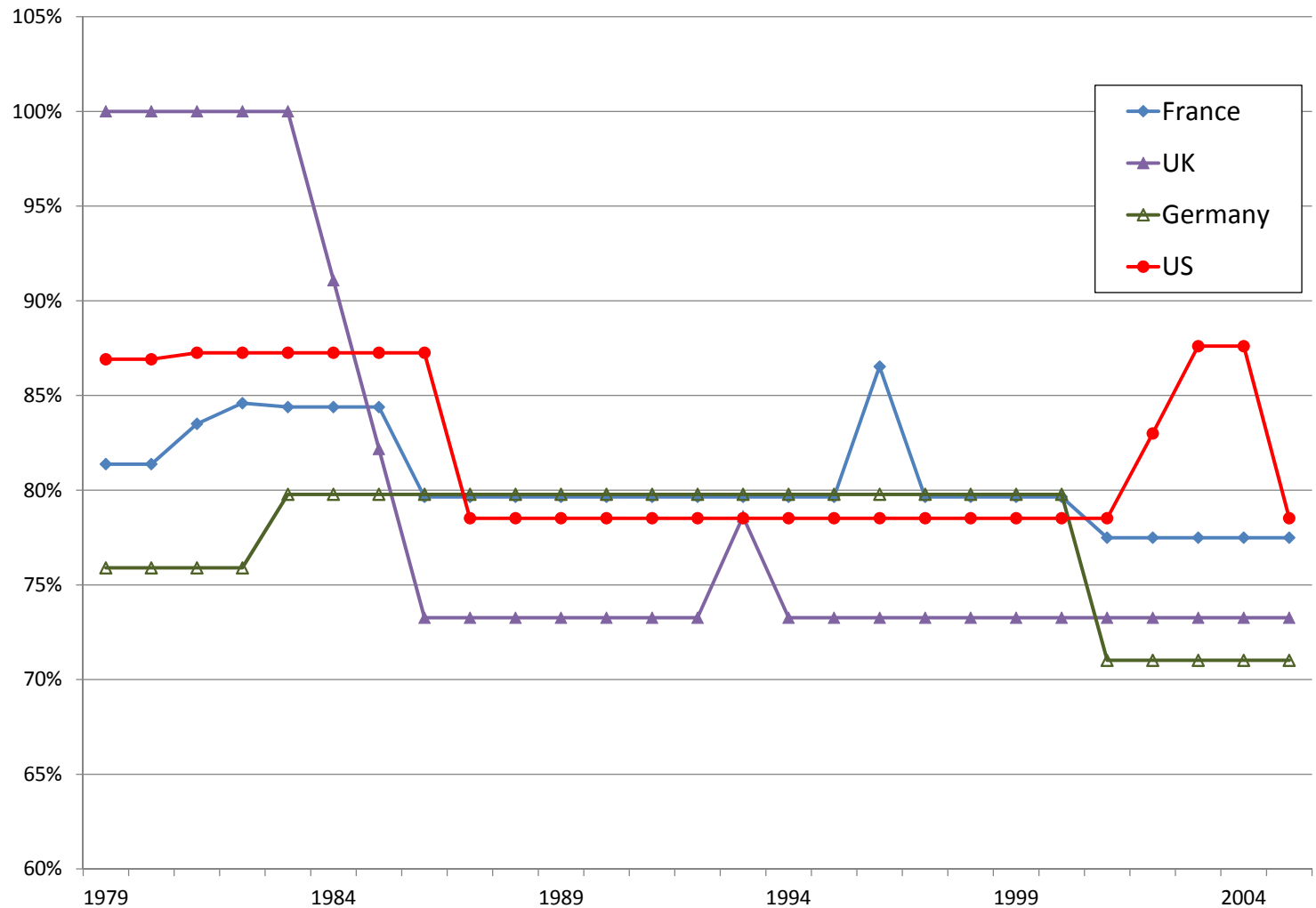
Trends in corporate taxation

Trend 2 : Decrease in depreciation allowances

- **Broadening of the tax base while reduction in rates**
  - Present discounted value (PDV) of allowances for investment reduced from 90-100% to 60-70%
  - In particular in the U.K. in the 1980s
- **Increase in R&D allowances**
  - Introduction of research tax credit (RTC)

Trends in corporate taxation

Figure 2 – PDV of depreciation allowances



SOURCE : Devereux, Griffith and Klemm (2002), updated 2005.

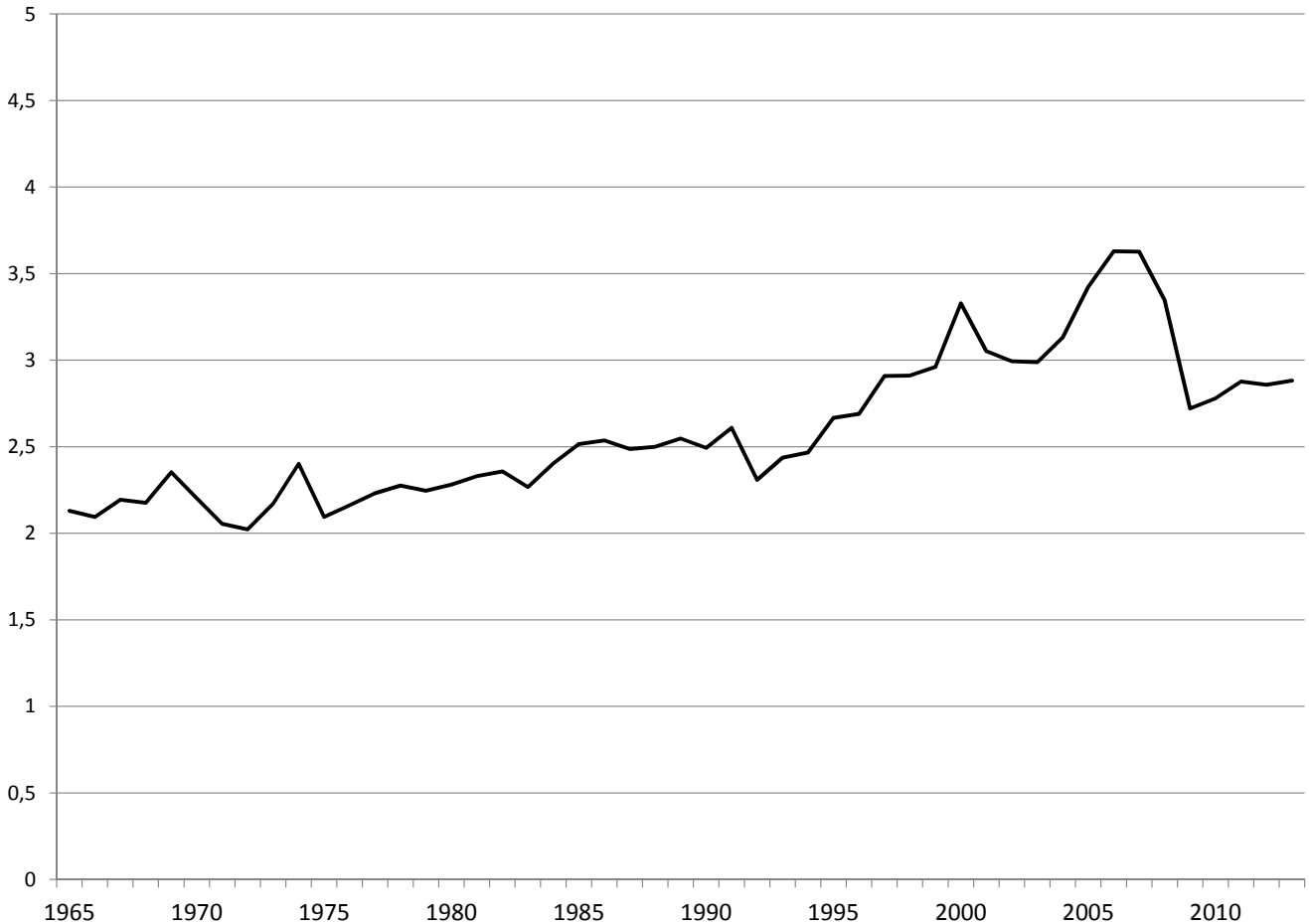
Trends in corporate taxation

Trend 3 : Little evidence of decrease in tax revenues

- **High volatility**
  - CIT represents between 1.5% to 3.5% of GDP
  - Corporation tax revenues have high volatility
  - Decrease during recession and increases during boom
- **Little decrease in tax revenues (except in the U.S.)**
  - Decrease in the U.S. during the 1960s and 1970s due to decline in profitability (Auerbach and Poterba, 1987)
  - No decrease in the U.K. with increased profitability (financial sector)
  - Little decrease in the E.U. (Devereux and Sørensen, 2006)

Trends in corporate taxation

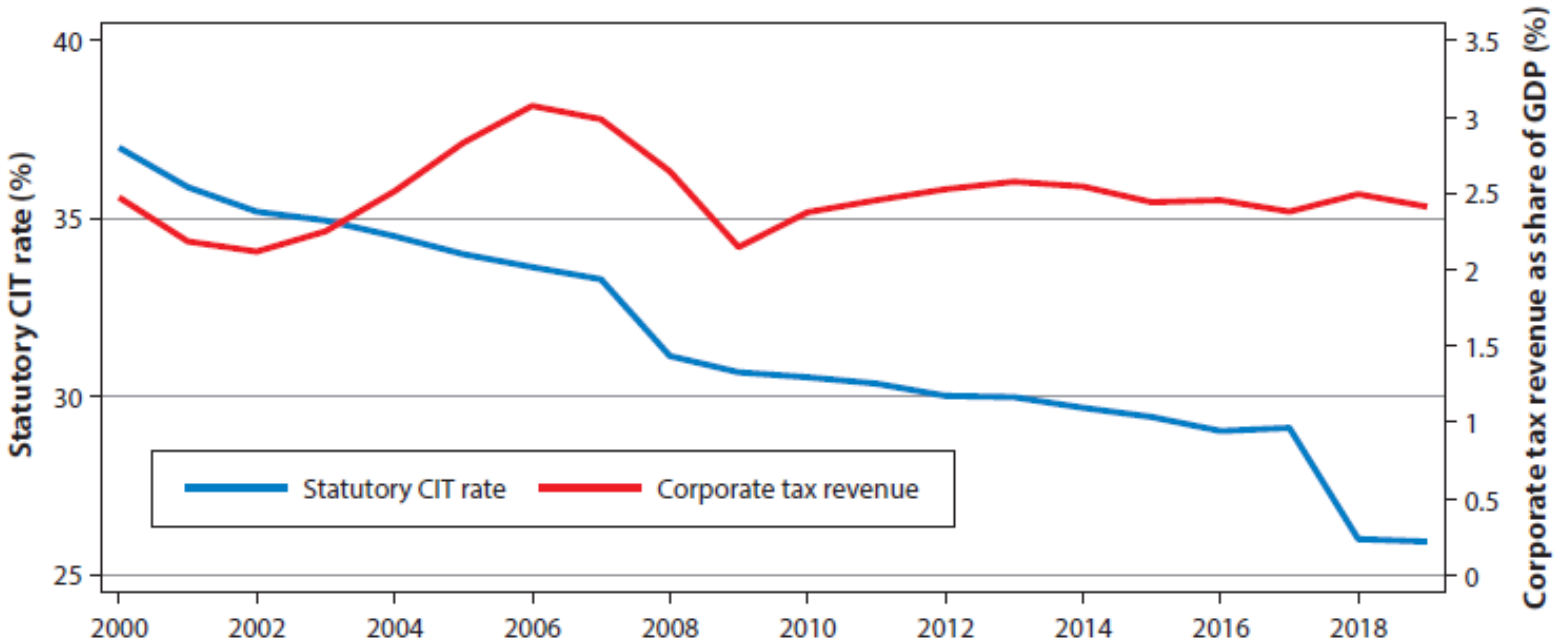
Figure 3 – CIT revenues as a share of GDP (OECD unweighted average)



Source : OECD Revenue Statistics

Trends in corporate taxation

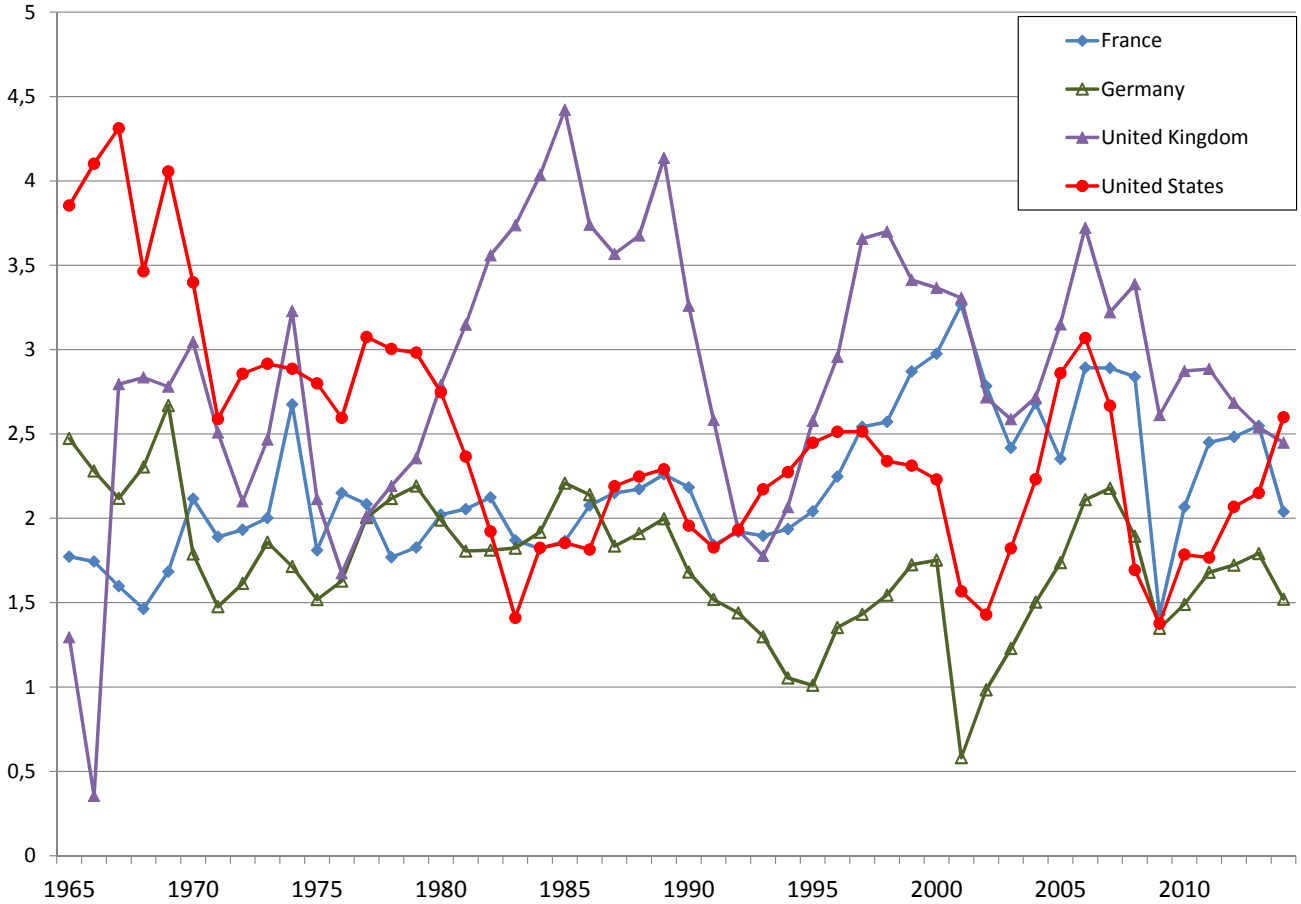
Figure 4 – CIT statutory tax rates and CIT revenues (OECD weighted average)



SOURCE : Fuest and Neumeier (2023), Fig. 1, OECD Revenue Statistics, weighted by GDP.

Trends in corporate taxation

Figure 5 – Corporate taxation as a share of GDP

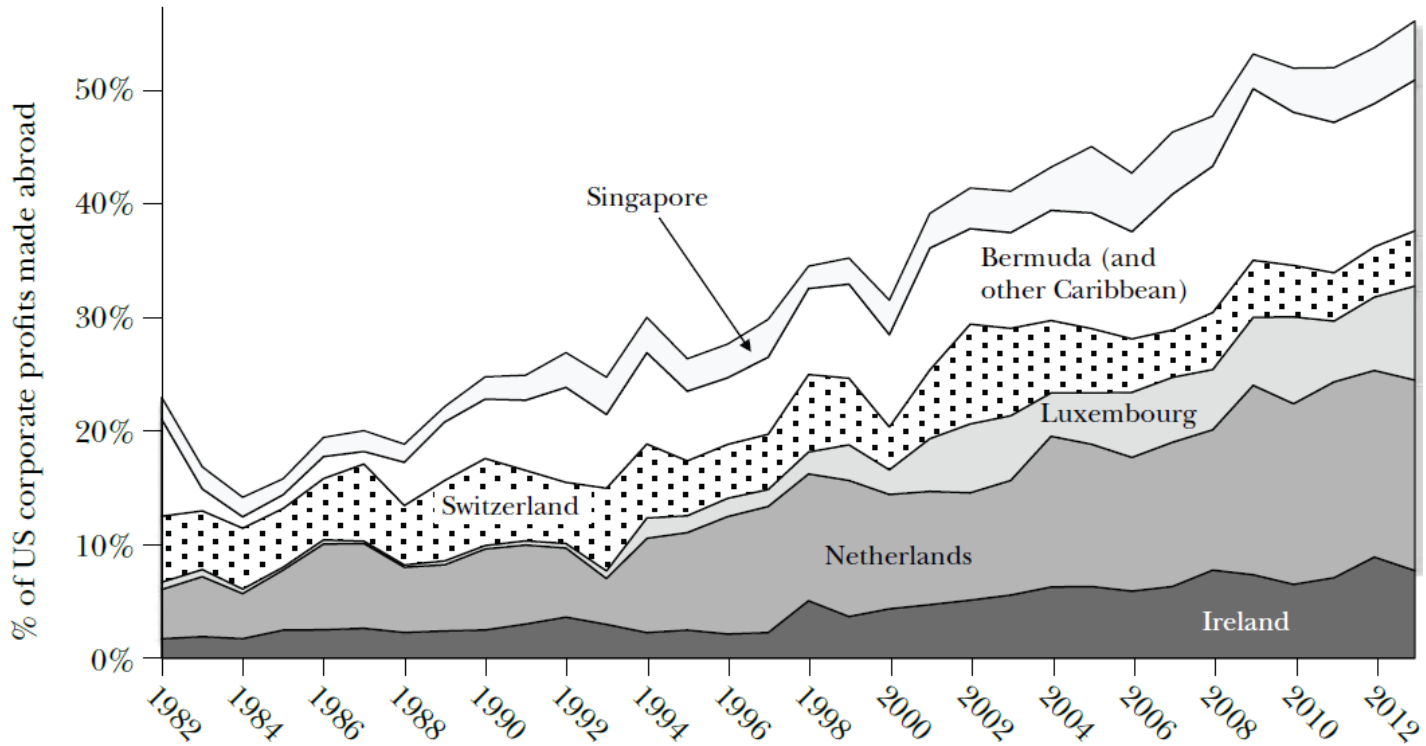


SOURCE : OECD Revenue Statistics

Trends in corporate taxation

Trend 4 : Increase in tax avoidance and evasion

Figure 6 – Share of Tax Havens in U.S. Corporate Profits Made Abroad



SOURCE : Zucman (2014), Fig. 2.

II. Incidence of corporate taxation

- **Remittance vs. incidence**
  - Firms remit large amount of taxes
    e.g., CIT, SSCs, VAT, income tax, etc.
  - Economic incidence is about change in individual welfare
  - Corporations don't *pay* taxes !

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- **Individuals potentially "paying" CIT**
  1. Capital owners (through lower profits)
  2. Workers (through lower wage)
  3. Consumers (through higher prices)
- One of the most contentious debate of tax policy !

II. Incidence of corporate taxation

1. Initial approach : assignment of ownership
2. Closed economy : Harberger model
3. Open economy case
4. Empirical approaches

Shareholder incidence theory

- **Simplest and oldest theory**
  - CIT falls on corporate shareholders in proportion of their ownership (see e.g., Saez and Zucman, 2023)
  - Individual share ownership highly concentrated
    e.g., U.S. top 0.01% wealth, equity = 45%
    e.g., U.S. bottom 90% wealth, equity = 1%

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- **Assignment not so simply applied (Auerbach, 2006)**
  - Different class of shares, with different rights to firms' profits
  - Indirect holding of equity (through other corporations, mutual fund, retirement funds, life insurance, etc.)

Table 2 – U.S. Corporate Equity Ownership (2004)

Asset Holder	**Amount**	**Percentage of Total**
Direct holding of equity		
Households	5,979	42.1%
Indirect holding of equity		
Mutual funds	3,694	26.0%
Retirement funds	2,993	21.1%
Life insurance companies	1,065	7.5%
Nonprofit organizations	597	4.2%
Bank personal trusts and estates	221	1.6%
State and local governments	89	0.6%
Savings institutions	28	0.2%
Rest of the world	-467	-3.3%

NOTE : Amounts net out inter-corporate holdings, in billions of U.S. dollars, end of the year amounts.
SOURCE : Auerbach (2006), Tab. 1.1, p. 6 ; based on data from Board of Governors of the Federal Reserve System.

Data on shareholder ownership

- **Bach, Bozio, Guillouzouic and Malgouyres (2023)**
  - Data on French ownership of reference shareholder (2016)
  - Matched between firm and personal income tax files
  - Degree of control over firms (not minority shareholder)
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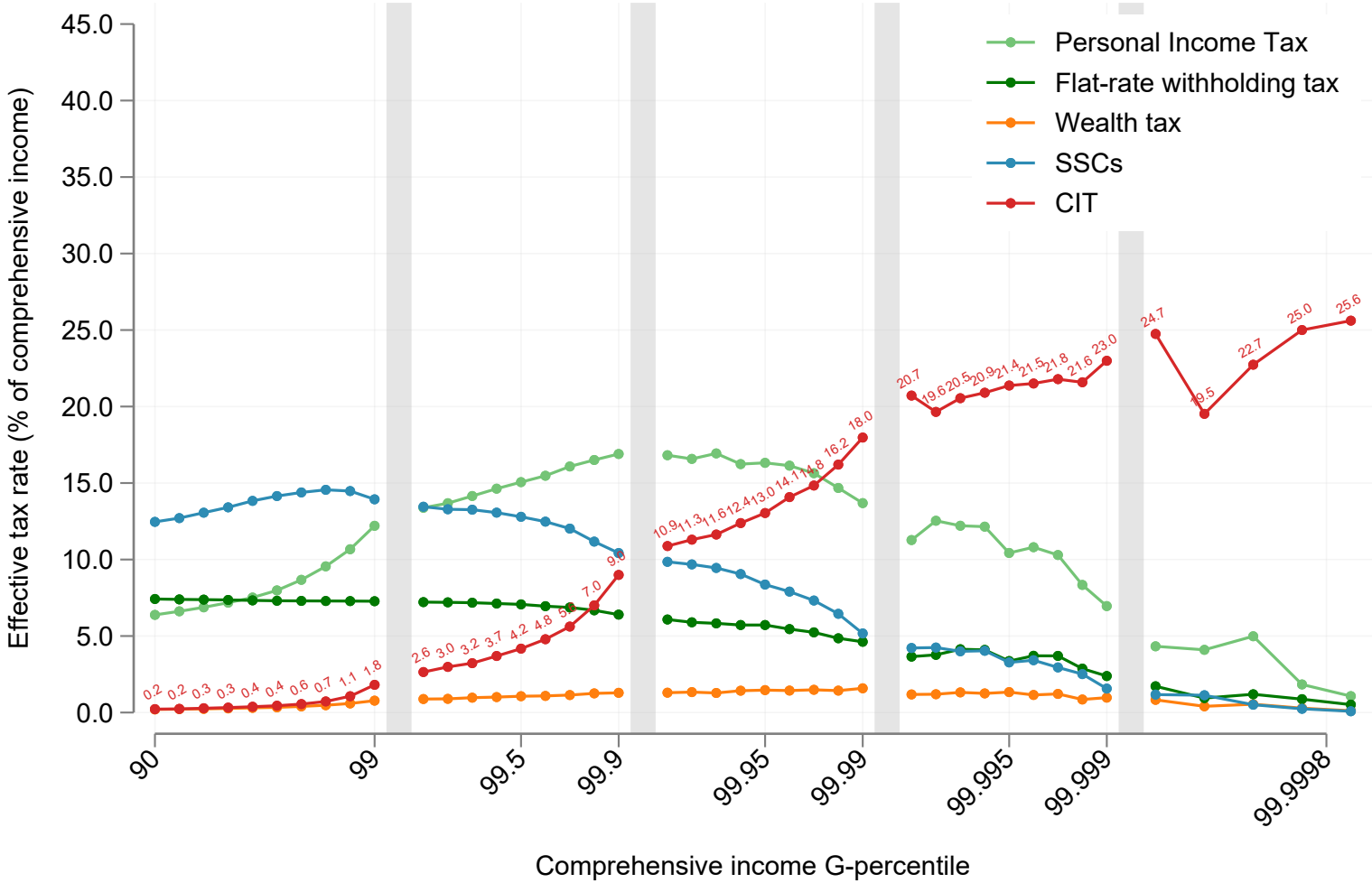
- **Distribution of CIT by ownership**
  - Attribute both net profits and CIT proportionately to individual tax units
  - Incorporate also foreign CIT on profits made abroad (CBCR data)
  - CIT appears as backstop for income taxation
  - Leaves out the incidence of dispersed ownership of large multinationals

Figure 7 – Personal and corporate taxation along the comprehensive income distribution (France, 2016)



Source : Bach, Bozio, Guillouzouic and Malgouyres (2023).

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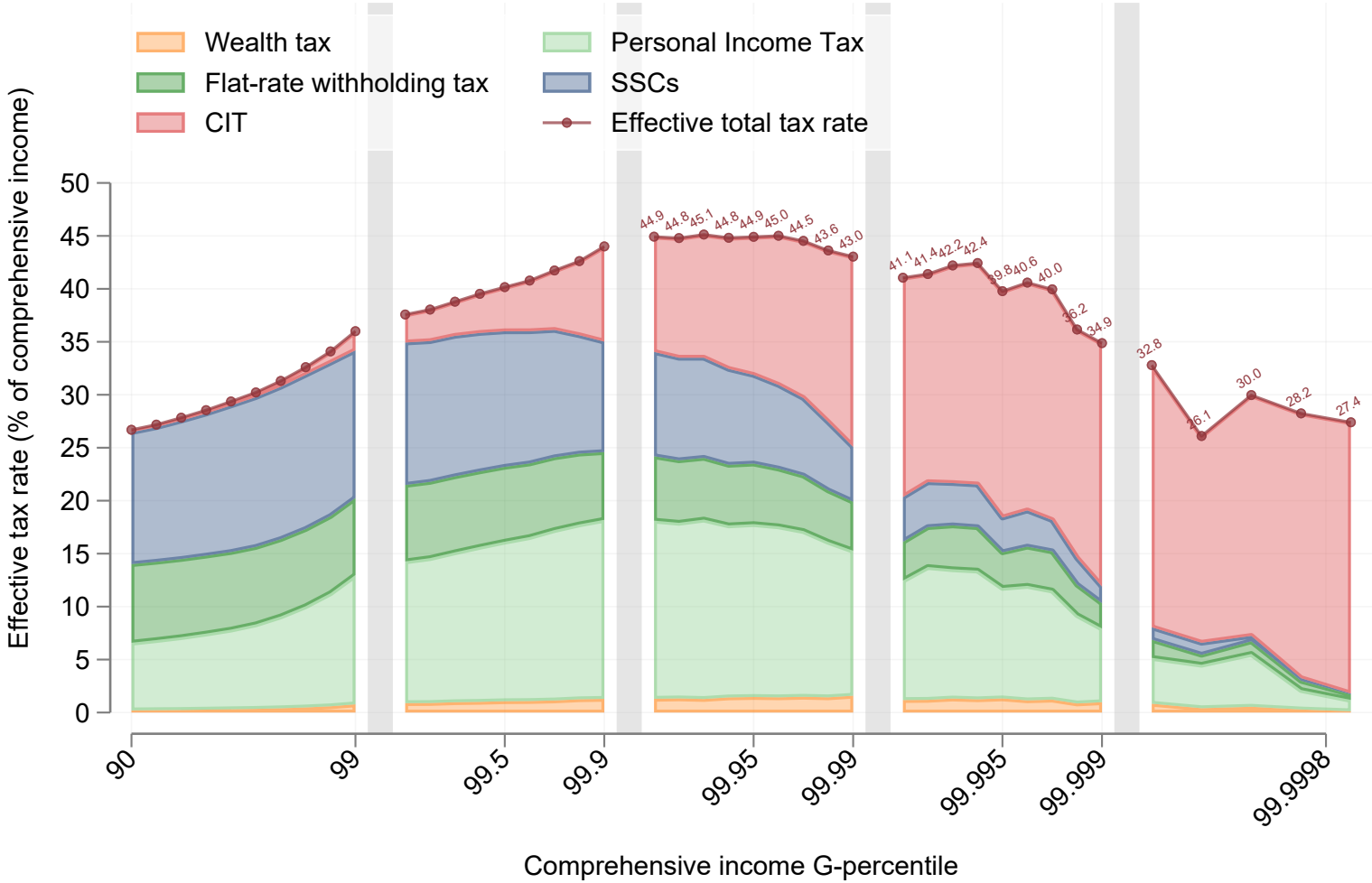

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Closed economy : Harberger model

- **Harberger (JPE, 1962)**
  - A static GE model in a closed economy
  - Two sectors : corporate X and non-corporate Y
  - Two factors : labour L and capital K
  - Pioneering work in GE incidence

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- **Main assumptions**
  1. Fixed supply of factors (short-run, closed economy)
  2. Free factor mobility across sectors
  3. Full employment of factors
  4. Constant returns to scale in both production sectors
  5. Perfect competition

- See Atkinson and Stiglitz (1980, chap. 6) or Kotlikoff and Summers (1987, 2.2) ▸ Harberger model

Closed economy : Harberger model

- **Increase in CIT**
  - Assume small tax $d\tau$ on capital in sector X
  - Harberger assumes that CIT is an additional tax on capital income from corporate sector on top of income tax

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1. **Factor substitution effect : capital bears the tax**
   - Depending on elasticity of substitution between capital and labour ($\sigma_X > 0$)
   - Tax shifts production in sector X away from K
   - Aggregate demand for K decreases
   - As K is fixed, r decreases
     $\Rightarrow$ capital bears the burden of the tax

Closed economy : Harberger model

2. **Output effect : capital may not bear the tax**
   - Shift of demands towards other sector Y
   - Consequences for factor demands depend on relative factor intensities

   a. If X capital intensive
      - it reduces demand for capital
      - capital bears more of the tax

   b. If X labour intensive
      - it increases demand for capital
      - labour may bear some or all the tax

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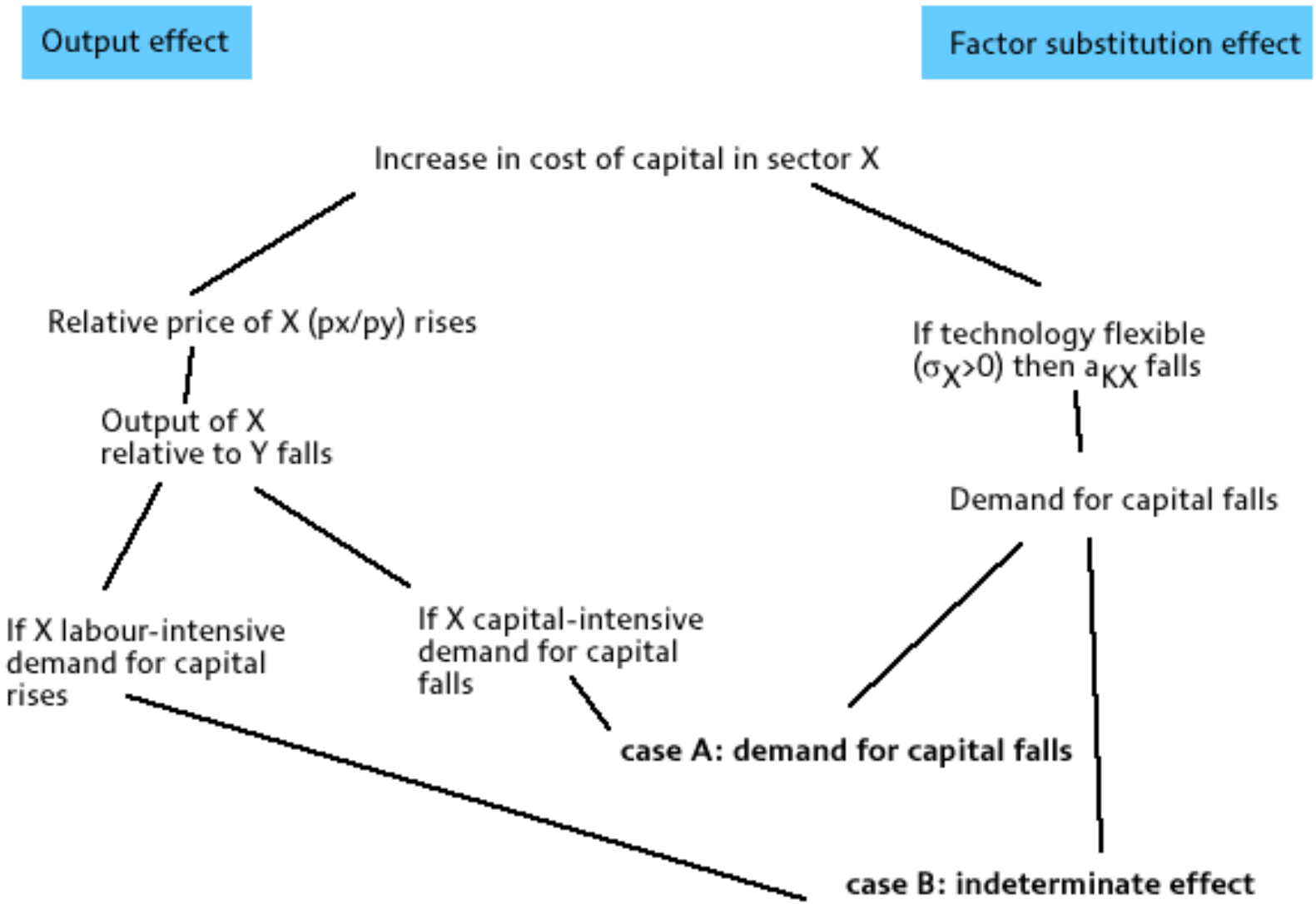
3. **Substitution + output effects : overshifting effects**
   - If corporate sector capital intensive, could lead to more than 100% incidence (overshifting)
   - If corporate sector labour intensive, could lead to all incidence on labour
     $\Rightarrow$ Taxed factor may bear less than 0 or more than 100% of tax

Closed economy : Harberger model



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- **Harberger's estimations**
  - Application in the case of two sectors (housing and corporate)
  - Estimates with plausible parameters for the U.S.
  - "*plausible alternative sets of assumptions about the relevant elasticities all yield results in which capital bears very close to 100 per cent of the tax burden*" (Harberger, 1962, p. 234)

Closed economy : Harberger model

- **Implications**
  1. Capital bears the entire CIT (not shifted to labour or consumers)
  2. All capital bears CIT (not only corporate sector)
  3. CIT is less progressive than under the shareholder-incidence assumption but contributes still to tax progressivity
  4. CIT distorts allocation of capital between corporate and non-corporate sector

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- **Limits to Harberger model**
  - CIT is not exactly an additional tax to income tax (cf. tax base and relationship with income tax)
  - Perfect competition
  - Closed economy assumption is key

Open economy case

- **Small open economy**
  - Survey by Kotlikoff and Summers (HPE, 1987, section 3.1)
  - Assume that capital is mobile internationally and labour immobile
    - Sector 1 (small open economy), L_1 fixed, and K_1 mobile
    - Sector 2 (rest of the world), L_2 fixed, and K_2 mobile
    - Total capital $K = K_1 + K_2$ is fixed

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- **Introduction of tax on capital K_1**
  - After-tax returns must be equal

$$r^* = F_{2K} = (1 - \tau)F_{1K}$$

  - Capital moves until after-tax returns are equal
    $\Rightarrow$ Labour bears all the tax burden

Incidence of corporate tax : empirical evidence

- **Limited evidence**
  - Few variations : cross-country or local variations
  - Hard to identify direct effects and GE effects
  - Most of the lit. draws conclusion from sophisticated GE models

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- **Some recent evidence**
  - Cross-country : Arulampalam, Devereux and Maffini (EER, 2012)
  - U.S. : Suárez Serrato and Sidar (AER, 2016)
  - Germany : Fuest, Peichl and Siegloch (AER, 2018)

Arulampalam, Devereux and Maffini (EER, 2012)

- **Incidence of CIT in bargaining framework**
  - Two channels for CIT to affect wages
    - *direct* incidence : higher CIT reduces post-tax profit on which workers and firms bargain
    - *indirect* incidence : CIT affects pre-tax profits through investment or output prices
  - Focus on direct effect of CIT : aim to estimate impact of CIT on wages, conditional on output

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- **Data**
  - Firm data from 9 countries over 1996-2005
  - 55,082 firms with accounting data (balance sheets, profits, loss)

Arulampalam, Devereux and Maffini (EER, 2012)

- **Methodology**
  - Estimation of dynamic panel model

$$w_{i,t} = \sum_{j=1}^{2} \gamma_j w_{i,t-j} + \sum_{j=0}^{2} \beta_j x_{i,t-j} + \alpha_i + \alpha_t + \varepsilon_{i,t}$$

    - $w_{i,t}$ average wage at firm i in period t
    - $x_{i,t}$ tax liability and other controls (e.g., value added)
    - firm fixed effect α_i

Arulampalam, Devereux and Maffini (EER, 2012)

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  - $w_{i,t}$ average wage at firm i in period t
  - $x_{i,t}$ tax liability and other controls (e.g., value added)
  - firm fixed effect α_i

- **Instruments**
  - Tax liability is endogeneous
  - Two sets of instruments used :
    1. Country and year specific EMTR and ATR
    2. Lagged firm specific variables (e.g., fixed/tangible assets, negative profits in the past)

Arulampalam, Devereux and Maffini (EER, 2012)

- **Estimation**
  - FE estimator with firm dummies is inconsistent
  - First difference removes FE
  - Estimate first diff. equation with generalized method of moment (GMM) and system estimator
  - Very demanding in terms of data structure

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- **Estimation**
  - FE estimator with firm dummies is inconsistent
  - First difference removes FE
  - Estimate first diff. equation with generalized method of moment (GMM) and system estimator
  - Very demanding in terms of data structure
- **Results**
  - Headline elasticities of the wage bill with respect to CIT are -0.120 in the short run and -0.093 in the long run
  - In terms of incidence : 64% and 49% of CIT on wages

Arulampalam, Devereux and Maffini (EER, 2012)

Figure 9 – Basic specification with bargaining variables

Dependent variable: *log (wage rate)*	Basic specification (1)	Basic specification & union density (2)	Basic specification & all bargaining variables (3)
Log (wage rate)			
$t-1$	0.121***	0.116***	0.135***
	(0.022)	(0.024)	(0.024)
$t-2$	0.029***	0.024**	0.031***
	(0.010)	(0.011)	(0.011)
Log (tax per employee)	−0.095***	−0.118***	−0.120***
	(0.034)	(0.035)	(0.037)
$t-1$	0.033***	0.036***	0.036***
	(0.010)	(0.010)	(0.010)
$t-2$	0.006***	0.007***	0.007***
	(0.002)	(0.003)	(0.003)
Dummy: negative or zero tax bill	0.386***	0.376***	0.361***
	(0.078)	(0.091)	(0.088)
$t-1$	−0.096***	−0.094***	−0.089***
	(0.019)	(0.021)	(0.021)
$t-2$	−0.012**	−0.012**	−0.011*
	(0.005)	(0.006)	(0.006)
Log (value added per employee)	0.773***	0.849***	0.889***
	(0.069)	(0.069)	(0.067)
$t-1$	−0.136***	−0.145***	−0.155***
	(0.021)	(0.023)	(0.023)
$t-2$	−0.022***	−0.023**	−0.025***
	(0.008)	(0.009)	(0.009)

SOURCE : Arulampalam, Devereux and Maffini (2012), Tab. 6, p. 1049.

⇒ The short-run elasticity of the wage rate with respect to the tax per employee is -0.095 in the short run, and -0.066 in the long run

Arulampalam, Devereux and Maffini (EER, 2012)

Figure 10 – Estimated incidence and elasticities

	Table VI column (3)		Table VIII column (2)		Table VIII column (3)	
	Full sample		Stand — alone companies		Multinational group	
	Elasticity	Incidence	Elasticity	Incidence	Elasticity	Incidence
Short run						
Tax bill per employee t	−0.120(0.037)	−0.637 (0.195)	−0.118 (0.041)	−0.687 (0.239)	−0.117 (0.047)	−0.586 (0.237)
Value added per employee f	0.498 (0.121)	0.222 (0.054)	0.521 (0.151)	0.269 (0.078)	0.415 (0.155)	0.168 (0.063)
Long run						
Tax bill per employee t	−0.093 (0.031)	−0.493 (0.164)	−0.076 (0.029)	−0.439 (0.171)	−0.108 (0.046)	−0.543 (0.230)
Value added per employee f	0.558 (0.093)	0.249 (0.041)	0.611 (0.114)	0.315 (0.059)	0.531 (0.136)	0.214 (0.055)

SOURCE : Arulampalam, Devereux and Maffini (2012), Tab. 7.

⇒ a \$1 increase in the tax liability leads to a 64 cents reduction in total compensation in the short run, and a 49 cents reduction in the long run

Arulampalam, Devereux and Maffini (EER, 2012)

- **Take-aways**
  - About 50% of direct CIT effects (conditional on output) in firms with wage bargaining on workers
  - Indirect effects of CIT should be added to direct effects
  - Robustness of results not obvious given identification techniques

Fuest, Peichl and Siegloch (AER, 2018)

- **Overview**
  - Use German local business tax to estimate incidence of corporate taxes on wages
  - Each year, 8% of the 11,441 municipalities change tax rate

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  - Administrative linked employer-employee panel data (IAB)
  - Administrative data on German municipalities (tax rate, revenue, spending)

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- **Data**
  - Administrative linked employer-employee panel data (IAB)
  - Administrative data on German municipalities (tax rate, revenue, spending)
- **Methodology**
  - Two methods to establish causal impact
    - event-study method
    - distributed lag model
  - Generalized DiD to estimate average effect of tax change on wage

Fuest, Peichl and Siegloch (AER, 2018)

- **Local Business Tax (Gewerbesteuer)**
  - Most important tax instrument for municipalities
  - Applies to corporate and non-corporate firms
  - Tax base : operating profits (federal level), same as for CIT
  - CIT at municipal level $\tau^{mun} = \tau^{fed}\theta^{mun}$
    - basic federal level rate τ^{fed} (5.0% up to 2007)
    - municipalities decide on a multiplier θ^{mun} to basic tax rate
    - median θ^{mun} was 3.9, for median rate of 19.5%

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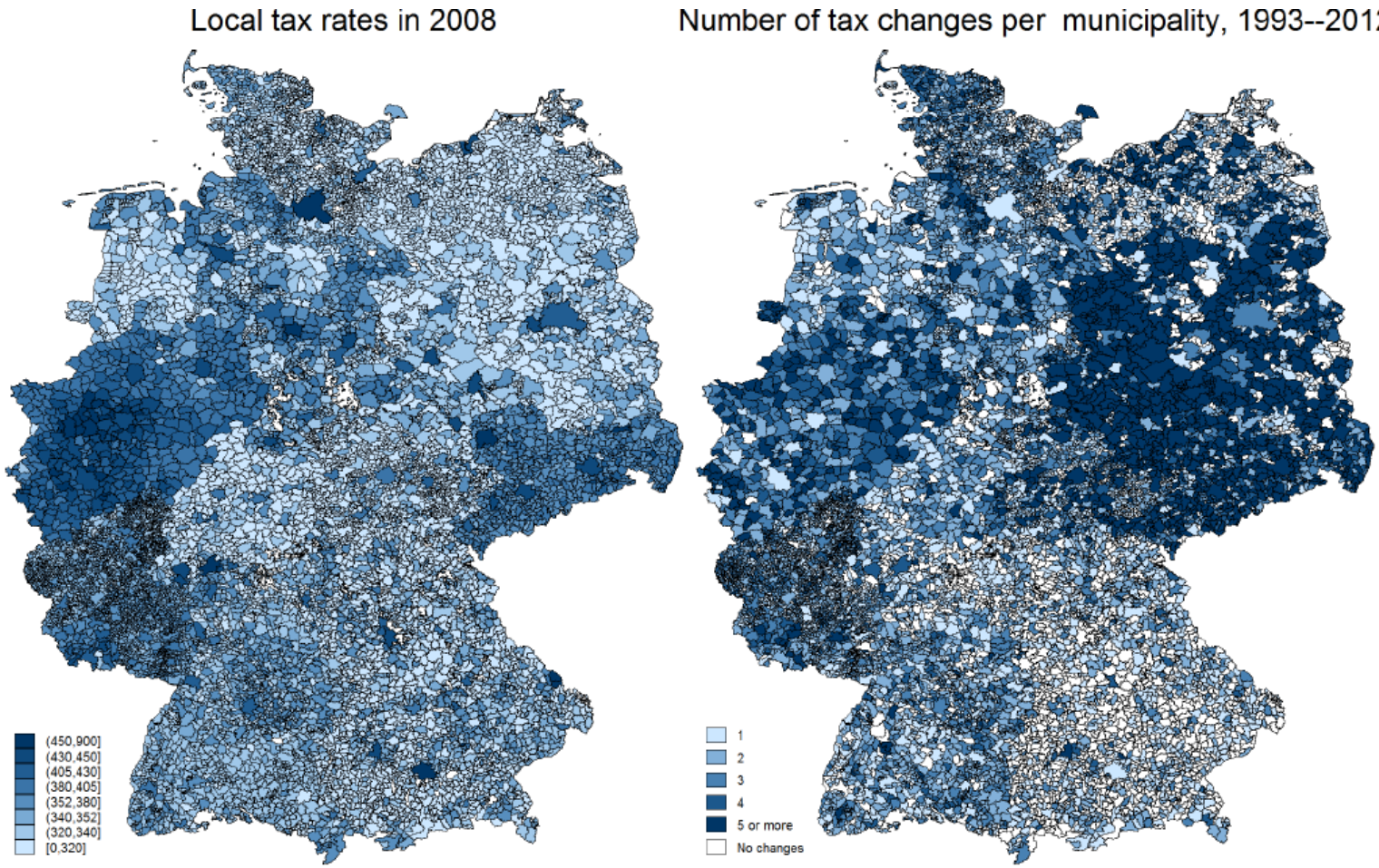
    - municipalities decide on a multiplier θ^{mun} to basic tax rate
    - median θ^{mun} was 3.9, for median rate of 19.5%

- **Corporate tax (Körperschaftsteuer)**
  - Additional tax for corporate firms
  - Today at 15% (so that total CIT at 34.5%, before 2008)

- **Personal Income Tax (Einkommensteuer)**
  - Additional tax for un-incorporated firms

Fuest, Peichl and Siegloch (AER, 2018)

Figure 11 – Cross-sectional and time variation in local tax rates



SOURCE : Fuest, Peichl and Siegloch (2015), Fig. 1.

Event-study method

- **Principle**
  - Exploit multiple events (e.g., firm announcements, tax changes)
  - Include lags and leads with respect to reference year
  - Check endogeneity/reverse causality : no pre-trend

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  - Exploit multiple events (e.g., firm announcements, tax changes)
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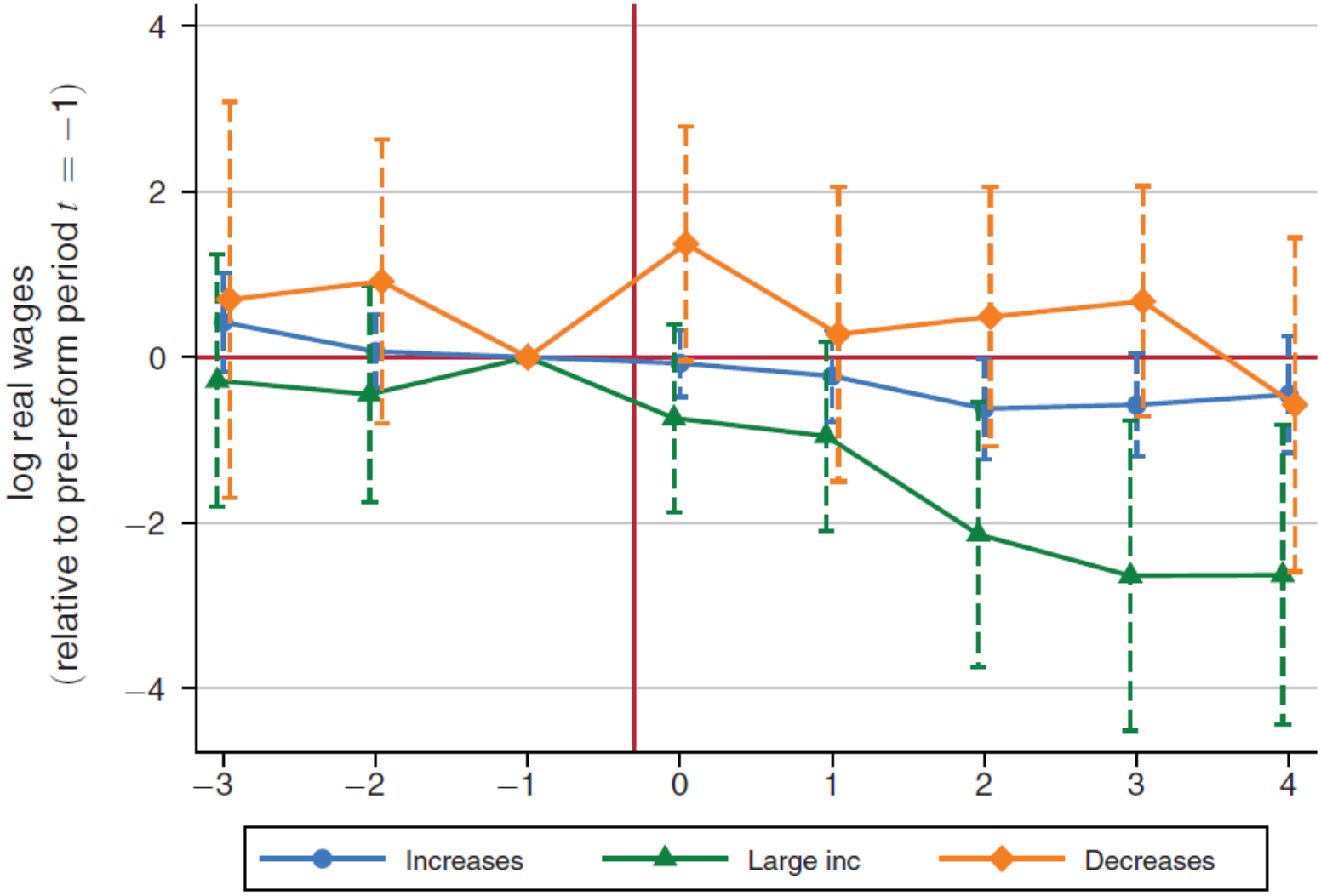
  - Check endogeneity/reverse causality : no pre-trend

- **Econometric specification**

$$lnw_{f,m,t} = \gamma_{-b} \sum_{i=b}^{B-t} \Delta\tau_{m,t+i} + \sum_{j=-b+1}^{a-t} \gamma_j \Delta\tau_{m,t+j} + \gamma_a \sum_{k=a}^{t-A} \Delta\tau_{m,t-k} + \mu_m + \psi_{m,t} + \varepsilon_{m,t}$$

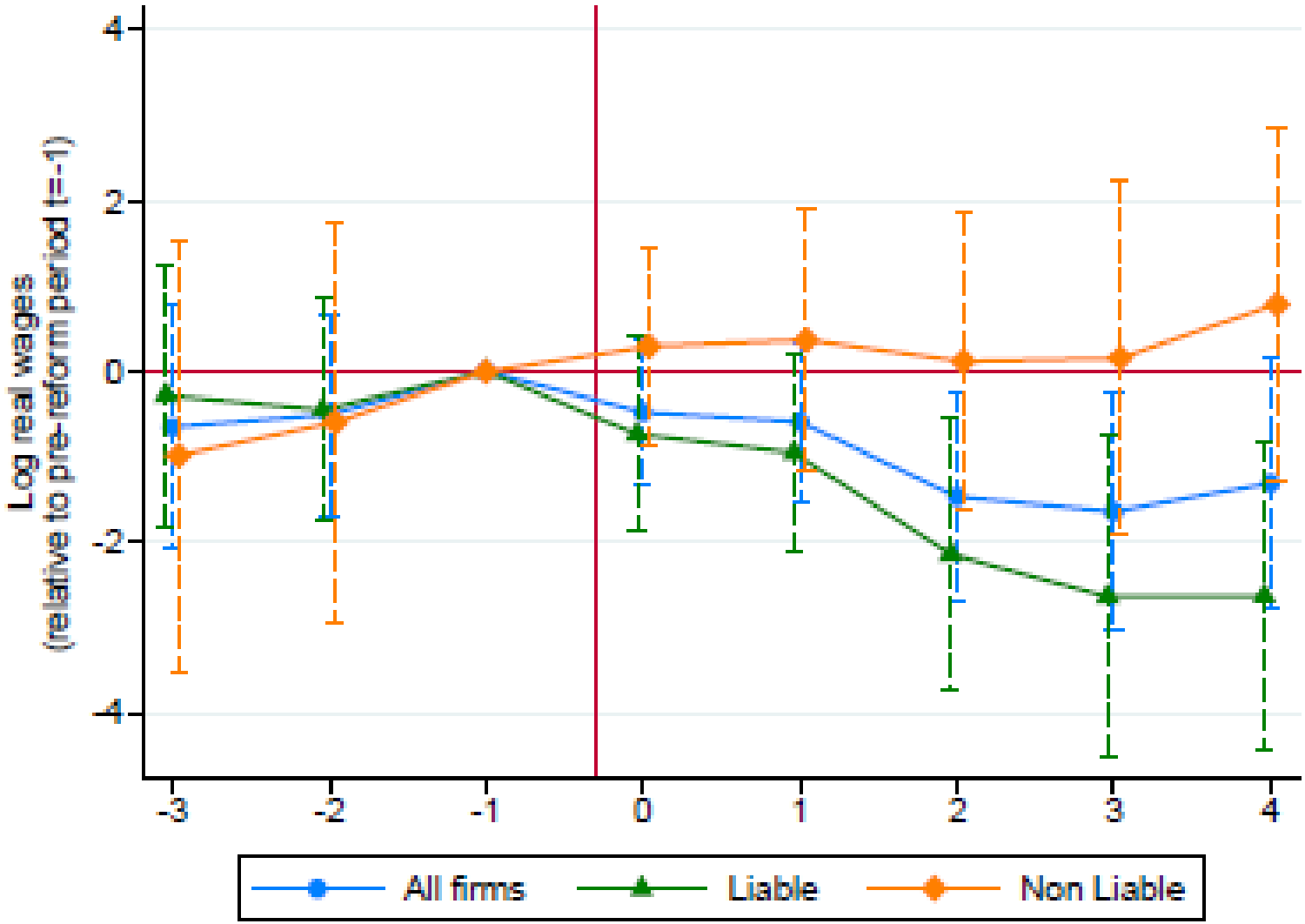
  - A first data year, B is last data year
  - b is start of event window, a is end of event window
  - μ municipal FE, ψ time trends FE

Figure 12 – Baseline wage effect



Source : Fuest, Peichl and Siegloch (2018), Fig. 2.A, p. 405.

Figure 13 – Effects on firm wages by firm liability



Source : Fuest, Peichl and Siegloch (2018), Fig. D.2, online appendix.

Table 3 – DiD estimates : baseline wage effects

	(1)	(2)	(3)	(4)	(5)	(6)
Log net-of-LBT rate	0.388	0.229	0.386	0.396	0.343	0.399
	(0.127)	(0.110)	(0.127)	(0.128)	(0.164)	(0.118)
Incidence (I^w)	0.505	0.288	0.502	0.516	0.442	0.520
	(0.170)	(0.140)	(0.170)	(0.172)	(0.217)	(0.159)
State × year FE	✓			✓	✓	✓
Year FE		✓				
CZ × year FE			✓			
Municipal controls t-2				✓		
Firm controls t-2					✓	
Worker shares						✓
Observations	44,654	44,654	44,654	44,654	25,241	44,654

NOTE : LBT : local business tax, CZ : commuting zone.
SOURCE : Fuest, Peichl and Siegloch (2018), Tab. 1, p. 408.

Figure 14 – Heterogeneity : impact on wage

TABLE 3—DIFFERENCE-IN-DIFFERENCES ESTIMATES: WAGE EFFECTS BY FIRM TYPE

Stratified by	Effect of log net-of-LBT rate by firm type				Observations
Liability	Liable	Non-liable			69,249
	0.388	−0.178			
	(0.127)	(0.154)			
Sector	Manuf.	Const.	Trade	Serv.	44,654
	0.556	0.452	0.151	0.383	
	(0.155)	(0.248)	(0.276)	(0.253)	
CBA	Firm	Sector	None		44,654
	0.731	0.418	0.292		
	(0.351)	(0.127)	(0.239)		
Profitability	High	Medium	Low		43,622
	0.565	0.330	0.210		
	(0.214)	(0.187)	(0.200)		
Firm size (# workers)	Below 10	10 to 99	100 to 499	Above 500	44,654
	1.241	0.311	0.064	−0.212	
	(0.520)	(0.157)	(0.159)	(0.210)	
Size rel. to local labor market (market power)	Small	Medium	Large		44,654
	0.652	0.481	0.456		
	(0.310)	(0.206)	(0.169)		
Firm structure	Single-plant	Multi-plant			44,226
	0.426	0.223			
	(0.160)	(0.162)			
Ownership	German	Foreign			44,654
	0.449	−0.293			
	(0.141)	(0.298)			

Figure 15 – Worker heterogeneity : impact on wage

Stratified by	Effect of log net-of-LBT rate by worker type			Observations
Skill	High	Medium	Low	9,295,488
	0.013	0.357	0.377	
	(0.120)	(0.115)	(0.168)	
Gender	Female	Male		9,295,488
	0.530	0.325		
	(0.129)	(0.119)		
Occupation	Blue-collar	White-collar		9,295,442
	0.363	0.250		
	(0.132)	(0.104)		
Age	Young	Medium	Old	9,295,488
	0.507	0.317	0.329	
	(0.127)	(0.111)	(0.106)	

SOURCE : Fuest, Peichl and Siegloch (2018), Tab. 4.

Fuest, Peichl and Siegloch (AER, 2018)

- **Take-aways**
  - CIT partially incident on wages
  - Estimates of 51% shifted to workers
  - Lower than in GE estimates of small open economy but larger than traditional Harberger closed economy results
  - It implies lower redistributivity of most tax systems (compared to shareholder incidence)

Fuest, Peichl and Siegloch (AER, 2018)

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  - Estimates of 51% shifted to workers
  - Lower than in GE estimates of small open economy but larger than traditional Harberger closed economy results
  - It implies lower redistributivity of most tax systems (compared to shareholder incidence)

- **Further results**
  - Labour market institutions matter for incidence on wages
  - Effects on wages bigger for firms with firm-level bargaining (in line with rent bargaining theory)
  - Wage effects close to zero for very large firms, foreign-owned firms (firms with profit-shifting capabilities)
  - Low-skilled, young and female workers bear a larger share of the CIT burden

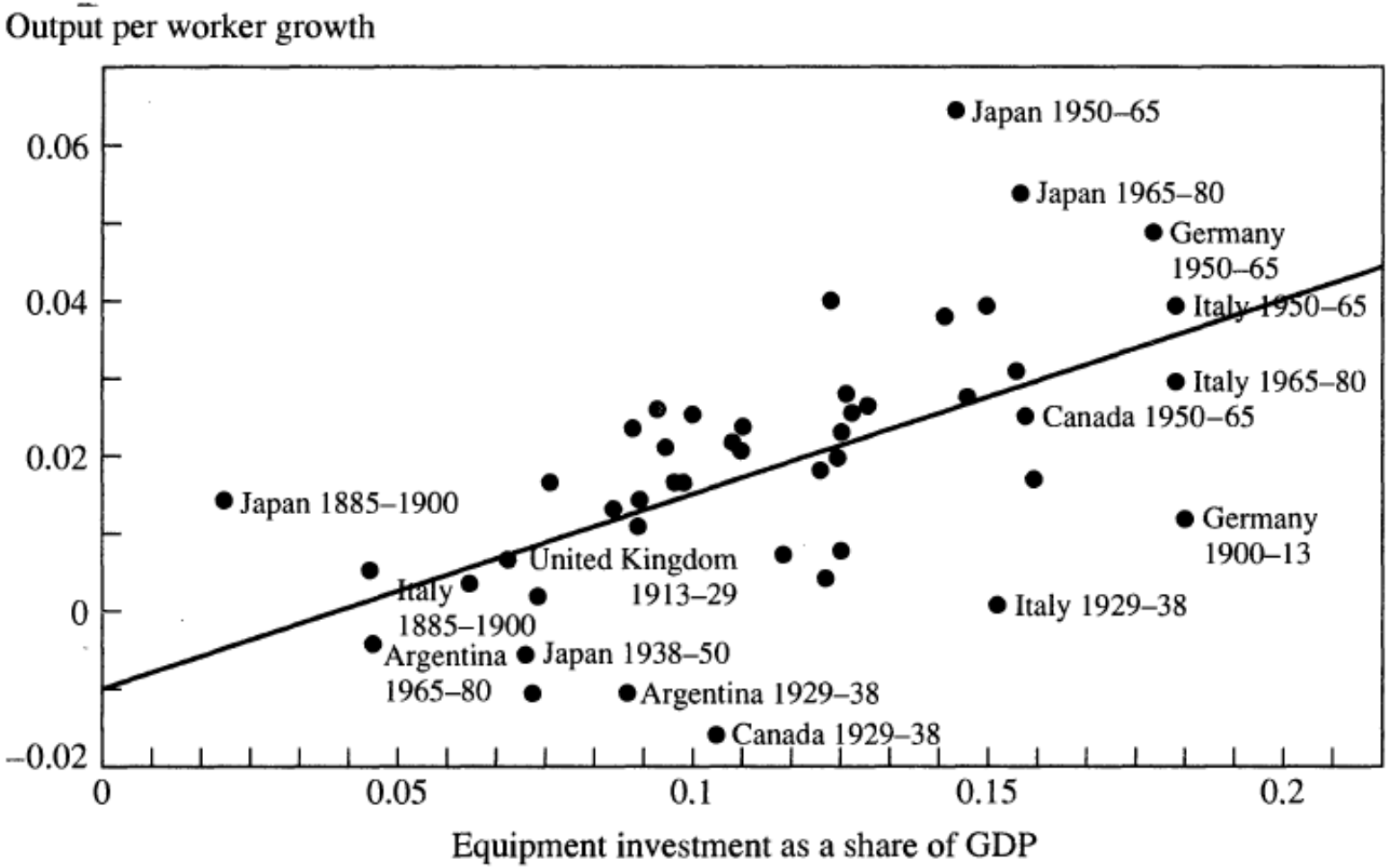
III. Efficiency costs

1. **Impact of CIT on investment**
   - Theory of user cost of capital
   - Cross-country evidence (Djankov et al., 2010)
   - Natural experiments (House and Shapiro, AER 2008 ; Zwick and Mahon, AER 2017)

2. **Impact of dividend taxation on investment**
   - Theory : traditional view, new view, agency models
   - Empirical evidence from dividend tax reforms :
     - U.S. : Chetty and Saez (2005), Yagan (AER, 2015)
     - Sweden : Alstadsæter, Jacob and Michaely (JPuBE, 2017)
     - France : Bach et al. (2024)

Investment matters

Figure 16 – Growth vs. equipment investment



Source: Authors' calculations based on data underlying De Long (1992). See table 4 for corresponding regression results.

SOURCE : De Long and Summers (1992), Fig. 1.

Theory of investment

- **Investment decision**
  - Determined by setting marginal benefits and costs of investment equal on a per-period basis

Theory of investment

- **Investment decision**
  - Determined by setting marginal benefits and costs of investment equal on a per-period basis
- **Model of firm behaviour**
  - Firm decides how much capital K_t to accumulate
  - Profit function $F(K_t)$ concave
  - Price of capital goods q_t
  - Depreciation rate δ
  - Required rate of return ρ
- **References**
  - Hassett and Hubbard (2002), Auerbach (2002)

User cost of capital

- **Equating marginal benefit to marginal cost**
  - Net present value (NPV) of new capital dK_{t+1}

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

  - Equating marginal benefit to marginal cost

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

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

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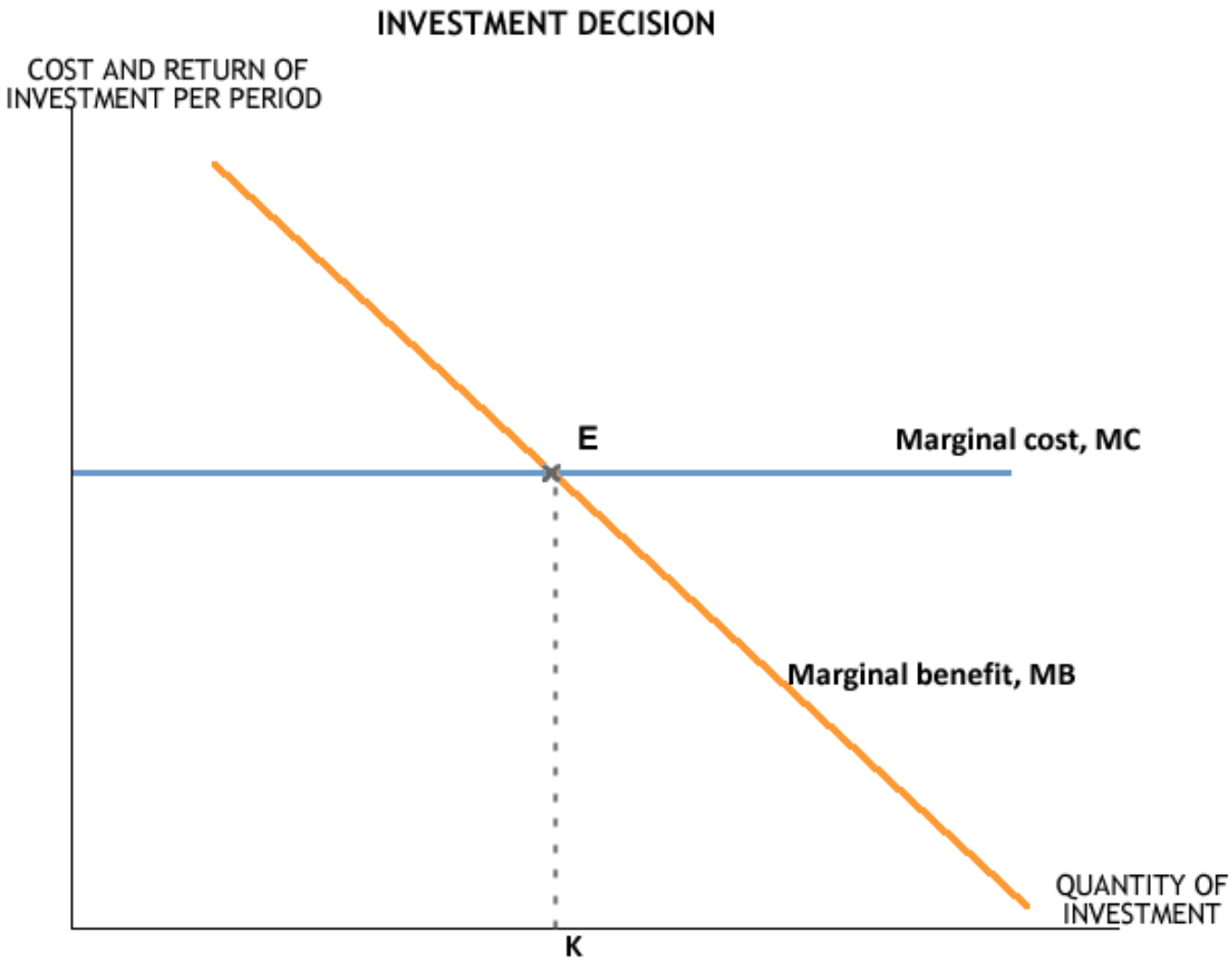
- **User cost of capital (Hall-Jorgenson 1967)**
  - User cost of capital is $q_t \left[\delta + \rho - \frac{q_{t+1} - q_t}{q_t} \right]$
  - With constant investment prices ($q_{t+1} = q_t$), user cost of capital equals required rate of return plus depreciation

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

Investment decision



User cost of capital

- **Introducing a corporate income tax** τ_{cit}
  - NPV of depreciation deductions D_t

$$\Gamma_t = \sum_{z=t}^{\infty} (1+r)^{-(z-t)} \tau_{cit} D_{z-t}$$

- **User cost of capital with CIT**
  - Euler equation : $F'(K_{t+1})$

$$\approx q_t \frac{1-\Gamma_t}{1-\tau_{cit}} \left[\delta + \rho - \frac{q_{t+1}(1-\Gamma_{t+1}) - q_t(1-\Gamma_t)}{q_t(1-\Gamma_t)} \right]$$

User cost of capital

- **Common CIT**
  - Only partial expensing $D_0 < 1$
  - Not full deductibility of financing cost

$$\rho'(\tau_{cit}) > 0$$

  - Required rate of return needs to be higher to justify investment $\Rightarrow$ Investment will be reduced by CIT

User cost of capital

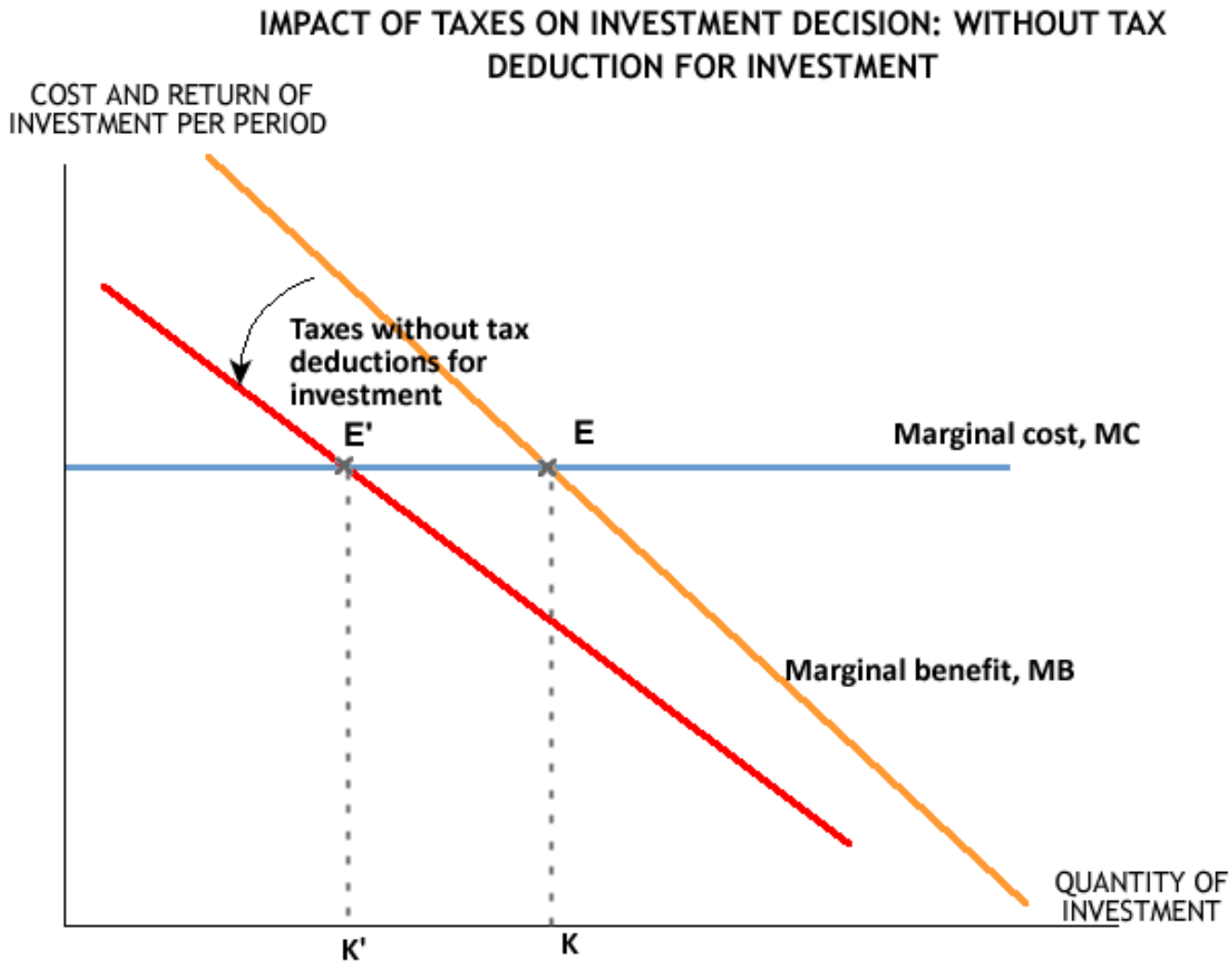
- **Case of cash flow tax**
  - Immediate and full expensing : $D_0 = 1$
  - Then we have $\Gamma_{t+1} = \tau_{cit}$
  - Optimal investment does not depend on CIT

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

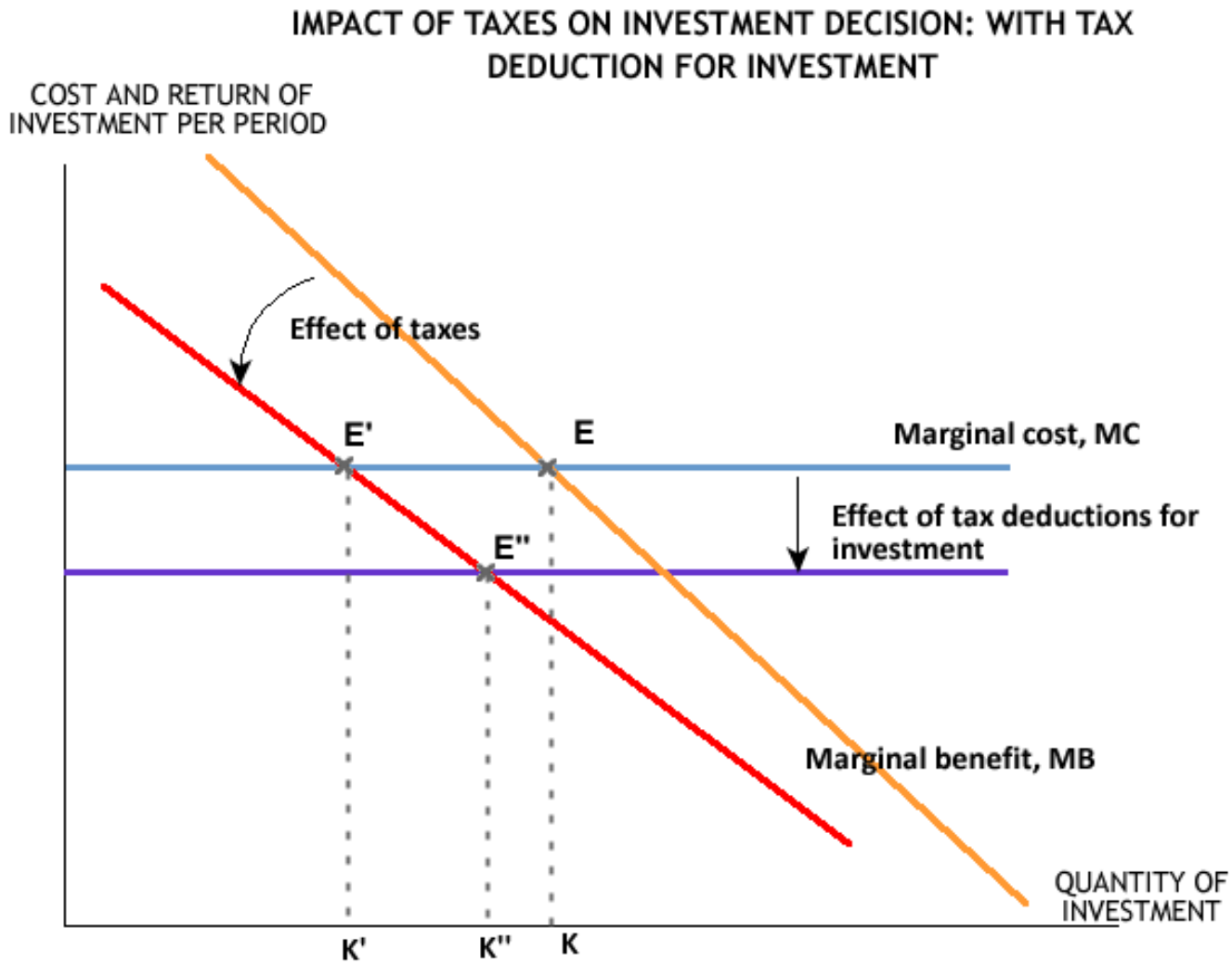
$\Rightarrow$ When all costs are deductible, CIT is a tax on pure profit

$\Rightarrow$ Case for cash-flow tax reform (Auerbach, 2010)

Impact on investment



Impact on investment



Impact of CIT on investment

- **Djankov, Ganser, McLiesh, Ramalho and Shleifer (AEJ-M, 2010)**
  - Measure of effective corporate tax rate for an identical mid-sized firm using survey from PricewaterhouseCoopers
  - Data from 85 countries for 2004
  - OLS regressions of investment and entrepreneurial activity on CIT rates
  - Identification : only controls for observables

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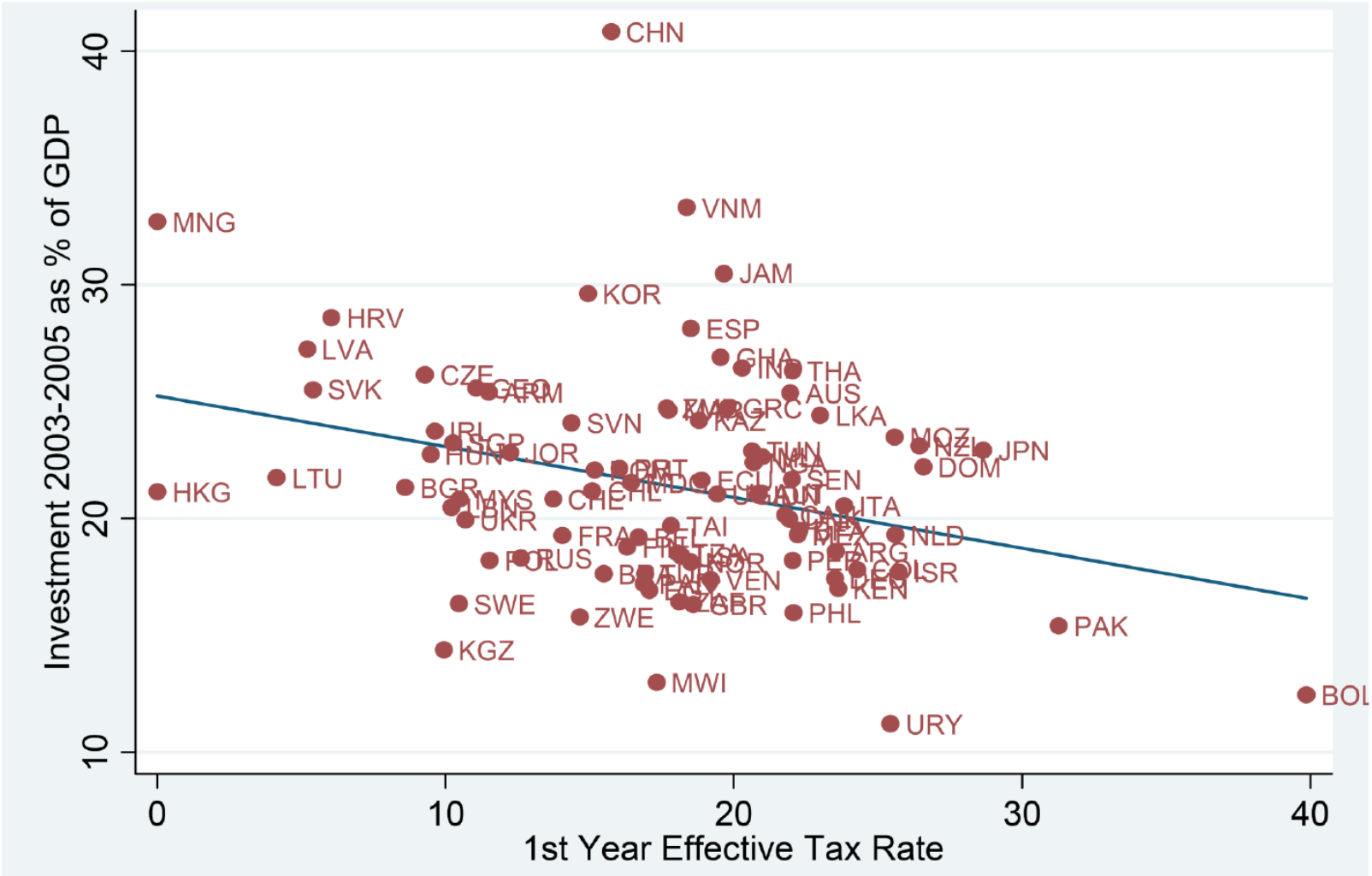
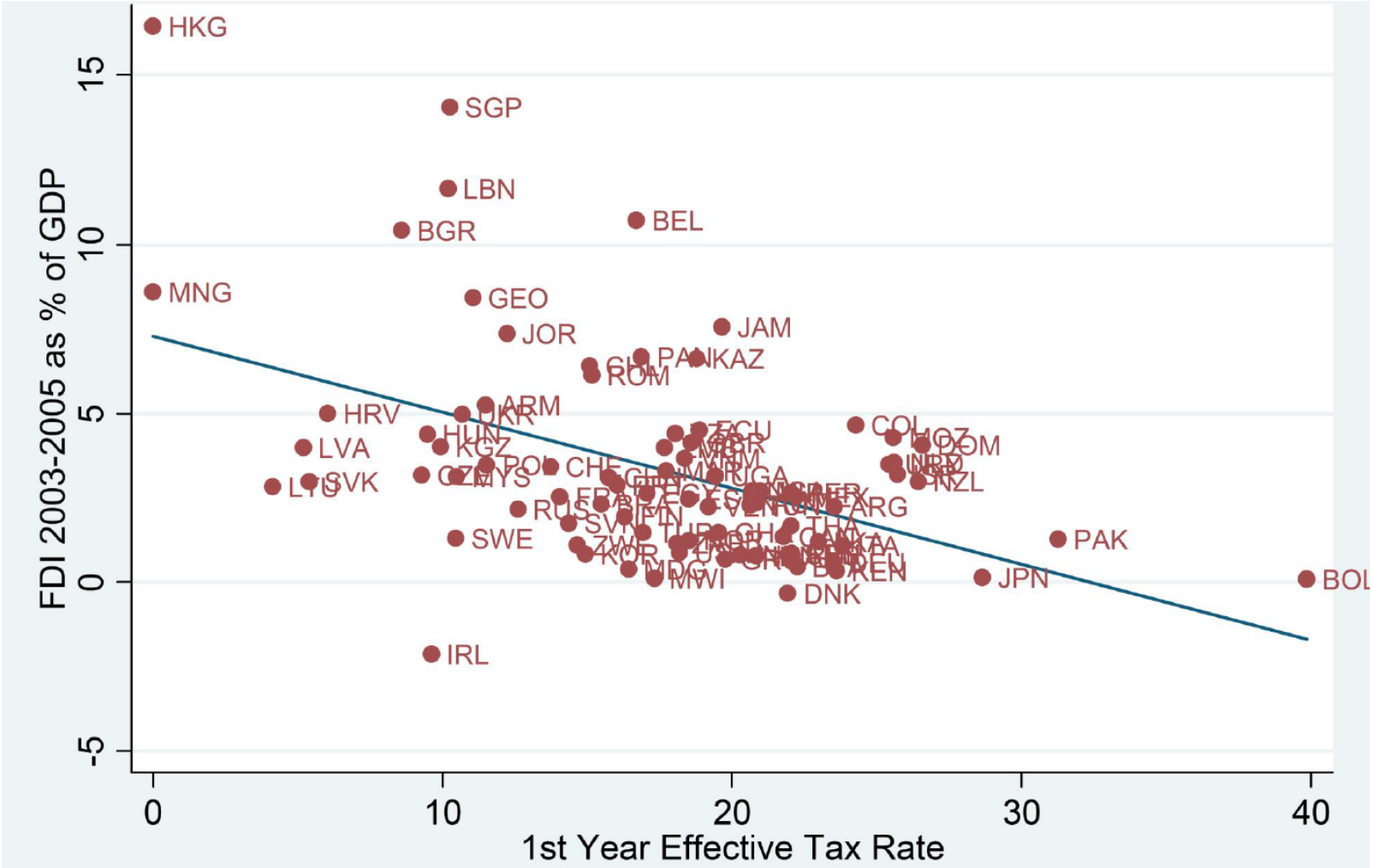
  - Data from 85 countries for 2004
  - OLS regressions of investment and entrepreneurial activity on CIT rates
  - Identification : only controls for observables
- **Results**
  - Substantial impact of CIT on investment
  - 10 p.p. increase in CIT leads to 2 p.p. decrease in investment as a share of GDP

Figure 17 – Effective CIT Rate and Investment



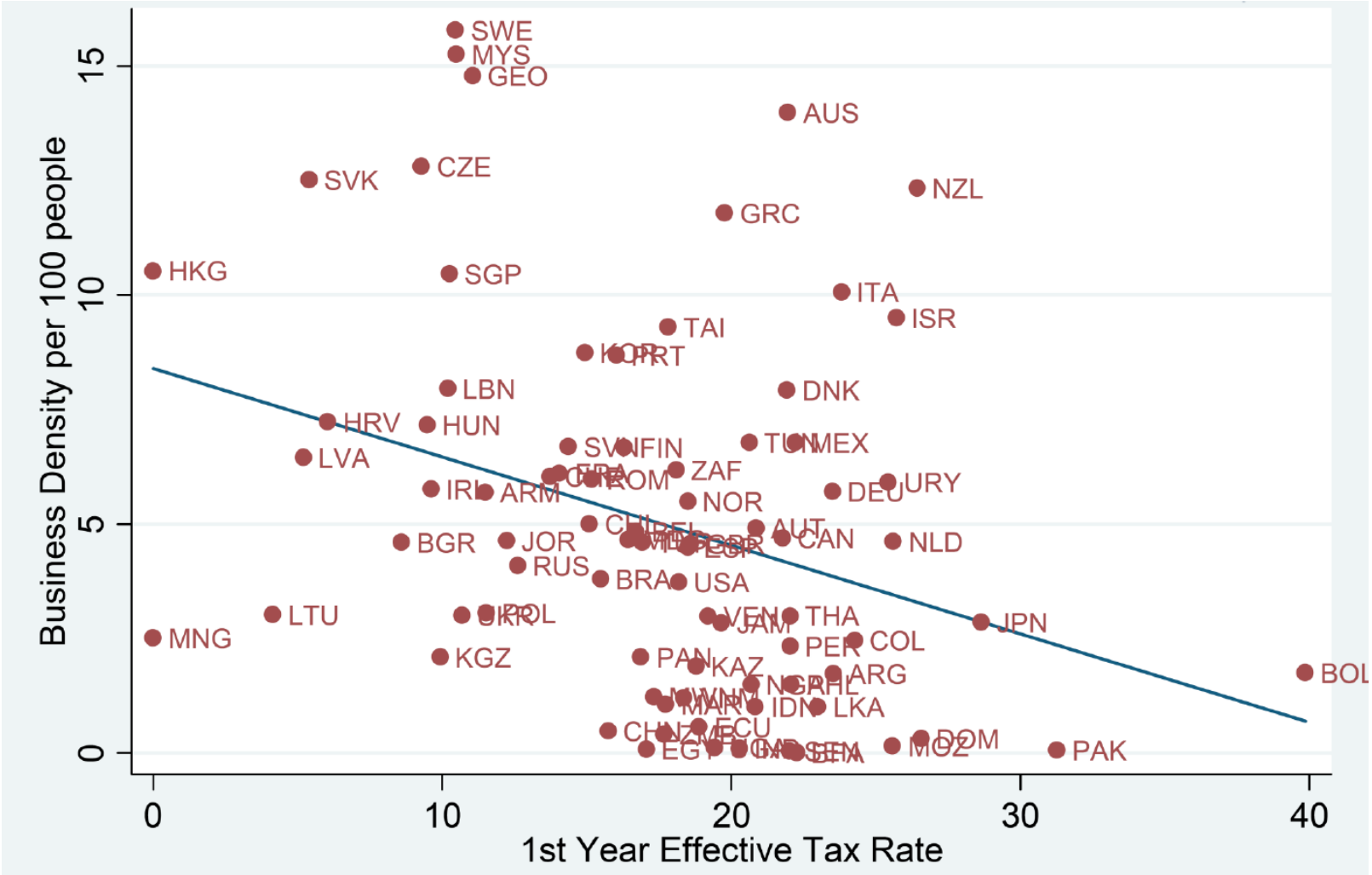
SOURCE : Djankov, et al. (2010), Fig. 1, p. 49.

Figure 18 – Effective CIT Rate and Foreign Direct Investment



SOURCE : Djankov, et al. (2010), Fig. 2, p. 49.

Figure 19 – Effective Tax Rate and Business Density



SOURCE : Djankov, et al. (2010), Fig. 3.

Figure 20 – Basic results

	Investment 2003–2005			FDI 2003–2005		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Investment						
Statutory corporate tax rate	−0.072			−0.195***		
	(0.076)			(0.046)		
First-year effective tax rate		−0.217***			−0.226***	
		(0.074)			(0.045)	
Five-year effective tax rate			−0.247***			−0.223***
			(0.080)			(0.050)
Constant	23.547***	25.239***	26.269***	9.044***	7.292***	7.718***
	(2.274)	(1.385)	(1.627)	(1.378)	(0.845)	(1.023)
Observations	85	85	85	84	84	84
R^2	0.01	0.09	0.10	0.18	0.23	0.20

SOURCE : Djankov, et al. (2010), Tab. 5.A.

Figure 21 – Basic results

	Business density			Average entry rate 2000–2004		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel B. Entrepreneurship						
Statutory corporate tax rate	−0.153**			−0.127**		
	(0.063)			(0.060)		
First-year effective tax rate		−0.193***			−0.137**	
		(0.062)			(0.057)	
Five-year effective tax rate			−0.200***			−0.136**
			(0.068)			(0.061)
Constant	9.473***	8.394***	8.913***	11.812***	10.452***	10.771***
	(1.864)	(1.162)	(1.375)	(1.790)	(1.048)	(1.262)
Observations	80	80	80	62	62	62
R^2	0.07	0.11	0.10	0.07	0.09	0.08

SOURCE : Djankov, et al. (2010), Tab. 5.B.

Zwick and Mahon (AER, 2017)

- **Accelerated depreciation**
  - Depreciation rules are changed for higher expensing
    e.g., from 10 years to 5 years depreciation length
  - Common policy to stimulate investment

  $\Rightarrow$ reduces user cost of capital and increases incentives to invest

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- **2002-03 U.S. policy (bonus I)**
  - Temporary accelerated depreciation in 2002-03
  - 30%-50% bonus depreciation for assets with recovery periods less than 20 years

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- **2002-03 U.S. policy (bonus I)**
  - Temporary accelerated depreciation in 2002-03
  - 30%-50% bonus depreciation for assets with recovery periods less than 20 years

- **2008-10 U.S. policy (bonus II)**
  - Temporary accelerated depreciation in 2008-10
  - 50%-100% bonus depreciation for assets with recovery periods less than 20 years

Zwick and Mahon (AER, 2017)

- **Empirical strategy**
  - Exploit bonus depreciation (i.e., investment can be faster deducted from CIT)
  - Bonus is more valuable for long-duration investments
  - DID between industries with long vs short duration investments

Zwick and Mahon (AER, 2017)

- **Empirical strategy**
  - Exploit bonus depreciation (i.e., investment can be faster deducted from CIT)
  - Bonus is more valuable for long-duration investments
  - DID between industries with long vs short duration investments

- **Data**
  - U.S. corporate tax data, 1993–2010
  - Large sample (128,151 firms)

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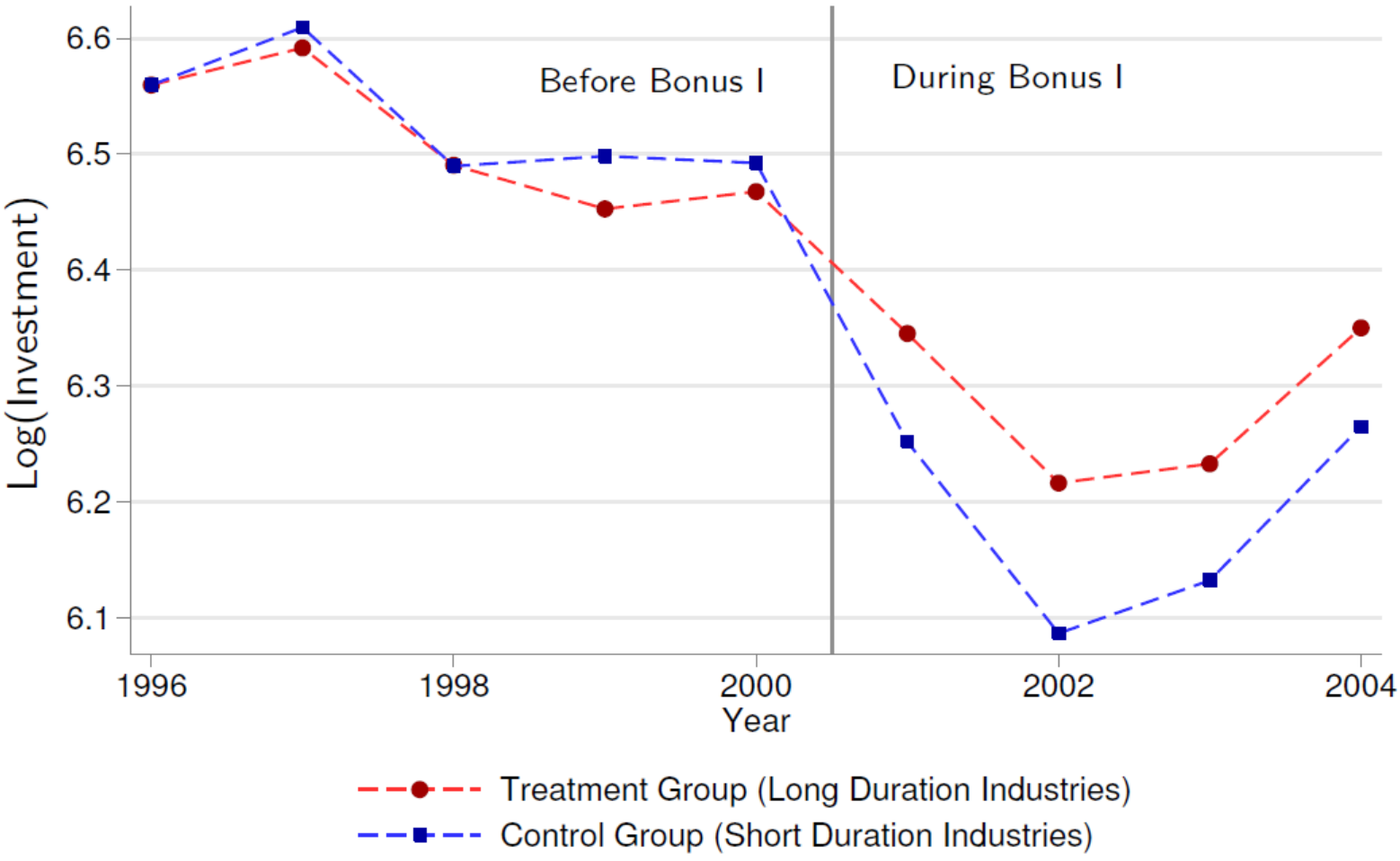
  - Bonus is more valuable for long-duration investments
  - DID between industries with long vs short duration investments

- **Data**
  - U.S. corporate tax data, 1993–2010
  - Large sample (128,151 firms)

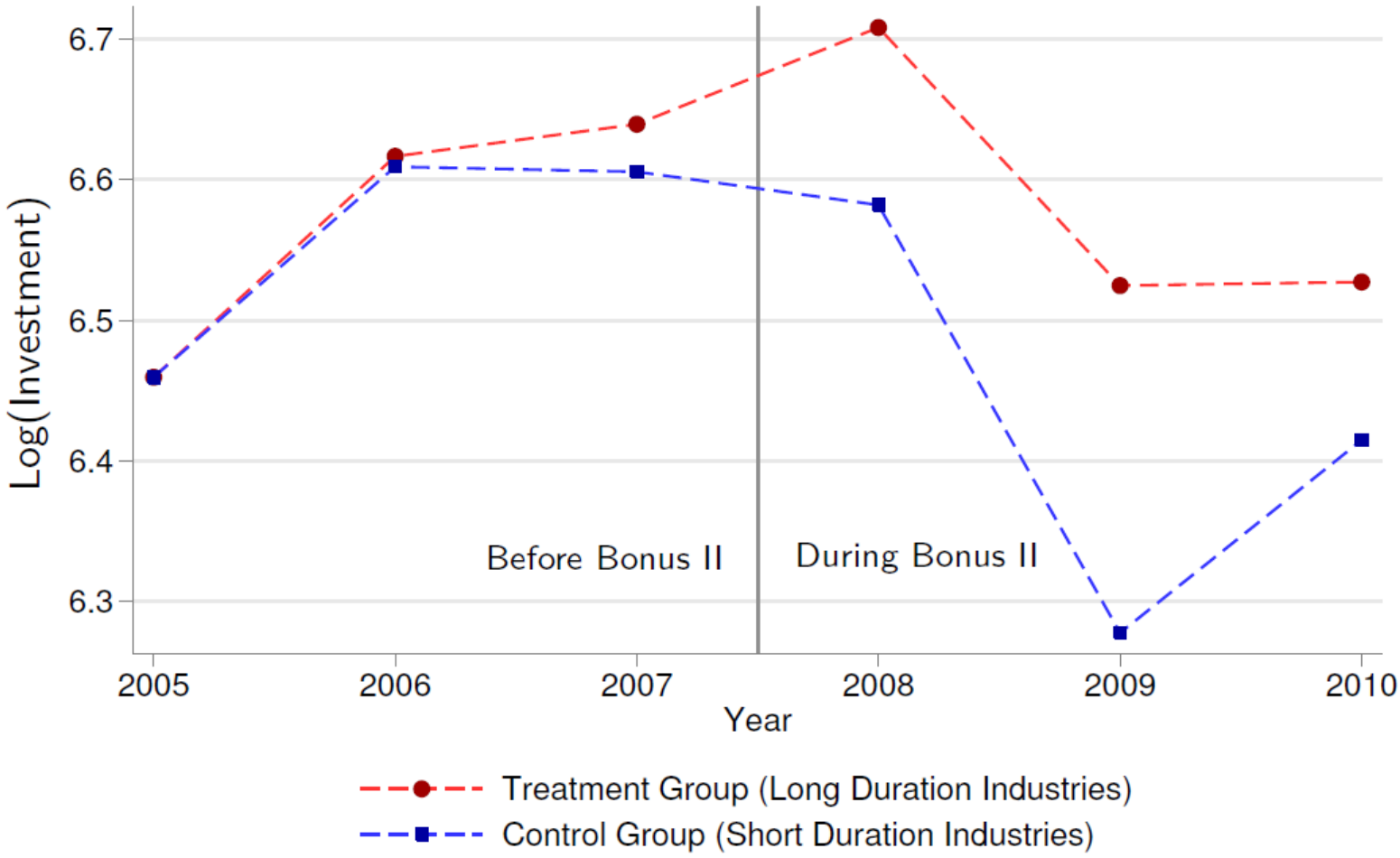
- **Results**
  - Large effect of bonus on investment : +10% (Bonus I), +17% (Bonus II)
  - Concentrated on small firms
  - When liquidity constraints matter

Figure 22 – DiD investment at the intensive margin (bonus I)



SOURCE : Zwick and Mahon (2017), Fig. 1.A, p. 229.

Figure 23 – DiD investment at the intensive margin (bonus II)



SOURCE : Zwick and Mahon (2017), Fig. 1.B, p. 229.

Take-away on investment impact of CIT

- **Hard to get empirical evidence**
  - Few studies with exogenous variation in CIT
  - But evidences point to negative impact on investment

Take-away on investment impact of CIT

- **Hard to get empirical evidence**
  - Few studies with exogenous variation in CIT
  - But evidences point to negative impact on investment
- **Policy take-away ?**
  - Expensing investment seems a good policy recommendation (e.g., cash flow tax)
  - Alleviating liquidity constraints could play also a role

Impact of payout taxes

- **Payout taxes**
  1. Dividend payments $\Rightarrow$ dividend tax τ_{div}
  2. Share repurchase $\Rightarrow$ capital gains tax τ_{cg}
  3. Retained earnings $\Rightarrow$ capital gains tax when gains are realised (lower effective rate because deferral)

Impact of payout taxes

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  1. Dividend payments $\Rightarrow$ dividend tax τ_{div}
  2. Share repurchase $\Rightarrow$ capital gains tax τ_{cg}
  3. Retained earnings $\Rightarrow$ capital gains tax when gains are realised (lower effective rate because deferral)

- **Including payout taxes in investment decision**

$$(1-\tau_{cit})[1-f\tau_{div}-(1-f)\tau_{cg}]F'(K_{t+1})=\rho$$

  - with f the fraction of after-tax profits paid in dividends
  - ignoring depreciation δ and depreciation deductions Γ

Traditional view of dividend taxation

- **Firms are cash-constrained**
  - Firms are cash-constrained (need external finance)
  - Marginal investments are funded out of equity or risky debt
  - Traditional view : Harberger (1962, 1966) ; Feldstein (1970) ; Poterba and Summers (1985)

- **Dividend taxation have negative impact on investment**

$$(1 - \tau_{cit})(1 - \tau_{div})F'(K_{t+1}) = \rho$$

  - Dividend taxation is equivalent to corporate income taxation

Dividend Puzzle

- **Dividend's tax disadvantage**
  - In most countries $\tau_{cg} < \tau_{div}$, and with deferral of capital gains, effective capital gains rate is much lower than statutory τ_{cg}
  - In the U.S., capital gains unsold at death escape capital gains taxation
  - So no incentives to pay dividends at all $\Rightarrow f = 0$

- **But large amount of dividend payouts**
  - In the U.S. 35% of publicly listed firms pay dividends, 40% in the U.K., 55% in France
  - Even if declining trend (66% US firms paid dividends in late 1970s)

- **Longstanding puzzle in corporate finance**
  - Black (1976), see survey by Farre-Mensa, Michaely and Schmalz (2014)

Why pay dividends ?

1. **Agency problem**
   - Shareholders are afraid that managers misuse large cash stockpiles
   - Equity holders prefer tax inefficiencies to reduce manager's control over the firms' assets
2. **Signaling theory**
   - Investors have imperfect information about the firm
   - By paying dividends, managers show that the firm has cash to burn...

New view of dividend taxation

- **Cash rich firms**
  - New view : King (1977), Auerbach (1979) and Bradford (1981)
  - Marginal investments are funded out of retained earnings or riskless debt
  - Marginal value of issuing equity is negative
    e.g., Microsoft, with abondant past profits

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  - Marginal value of issuing equity is negative
    e.g., Microsoft, with abondant past profits

- **Investment decisions**
  - Firms should not emit equity and split cash X (past profit) between D and K_{t+1} according to :

$$(1 - \tau_{cit}) f'(X - D) = r$$

  - Invest to point where after-tax marginal product equals bond return r

New view of dividend taxation

- **Dividend taxation does not affect investment**
  - Change in τ_{div} affects marginal return on investment (LHS) by the same factor that it changes the opportunity cost of investment (RHS)

$$(1-\tau_{cit})(1-\tau_{div})F'(K_{t+1}) = (1-\tau_{div})r$$

- **Implications**
  - Higher τ_{cit} lowers investment
  - Change in τ_{div} has no effect on dividend or investment

Impact of dividend tax cuts

- **Empirical evidence**
  - Scarce literature for lack of proper identification
  - Idea to test between old and new view

Impact of dividend tax cuts

- **Empirical evidence**
  - Scarce literature for lack of proper identification
  - Idea to test between old and new view
- **Poterba and Summers (JoF, 1984)**
  - U.K. data for 1955-1981
  - Exploit differentiated treatment of capital gains and dividend payments
  - Policy changes : (1965, capital gains tax ; 1973 integrated corporate tax)
  - Inspect goodness of structural investment models (e.g., CAPM)
  - Evidence that taxes on dividends impact substantially dividend payouts
    $\Rightarrow$ argument in favour of old view

Impact of dividend tax cuts

- **Chetty and Saez (QJE, 2005)**
  - Exploit the U.S. 2003 dividend tax cut
  - Jobs and Growth Tax Relief Reconciliation Act implemented by the Bush administration in 2003
  - Sunset clause : tax cut planed to end in 2009
  - τ_{DIV} reduced from 38.6% (top rate) to 15%

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  - τ_{DIV} reduced from 38.6% (top rate) to 15%

- **Methodology**
  - Simple diff : before/after in time series (dividend initiations are high frequency events)
  - Test for confounding trend using firms owned primarily by nontaxable institutions as a "control group"
    e.g., dividend income earned by government agencies, nonprofit organizations, and corporations are not affected by the tax change

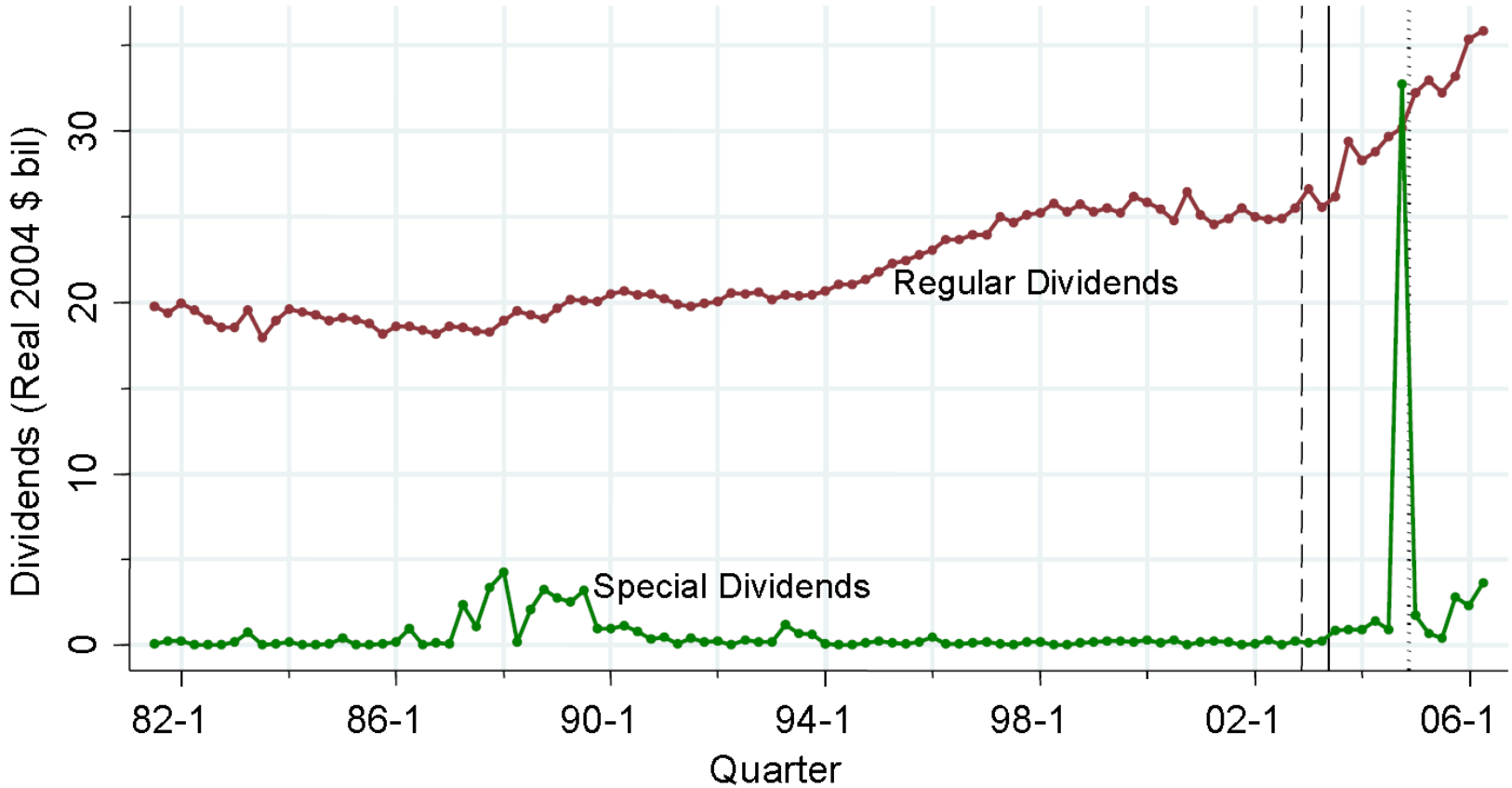
Impact of dividend tax cuts

- **Data**
  - Data on dividend payments up to the second quarter of 2004 from the Center for Research in Security Prices (CRSP)

Impact of dividend tax cuts

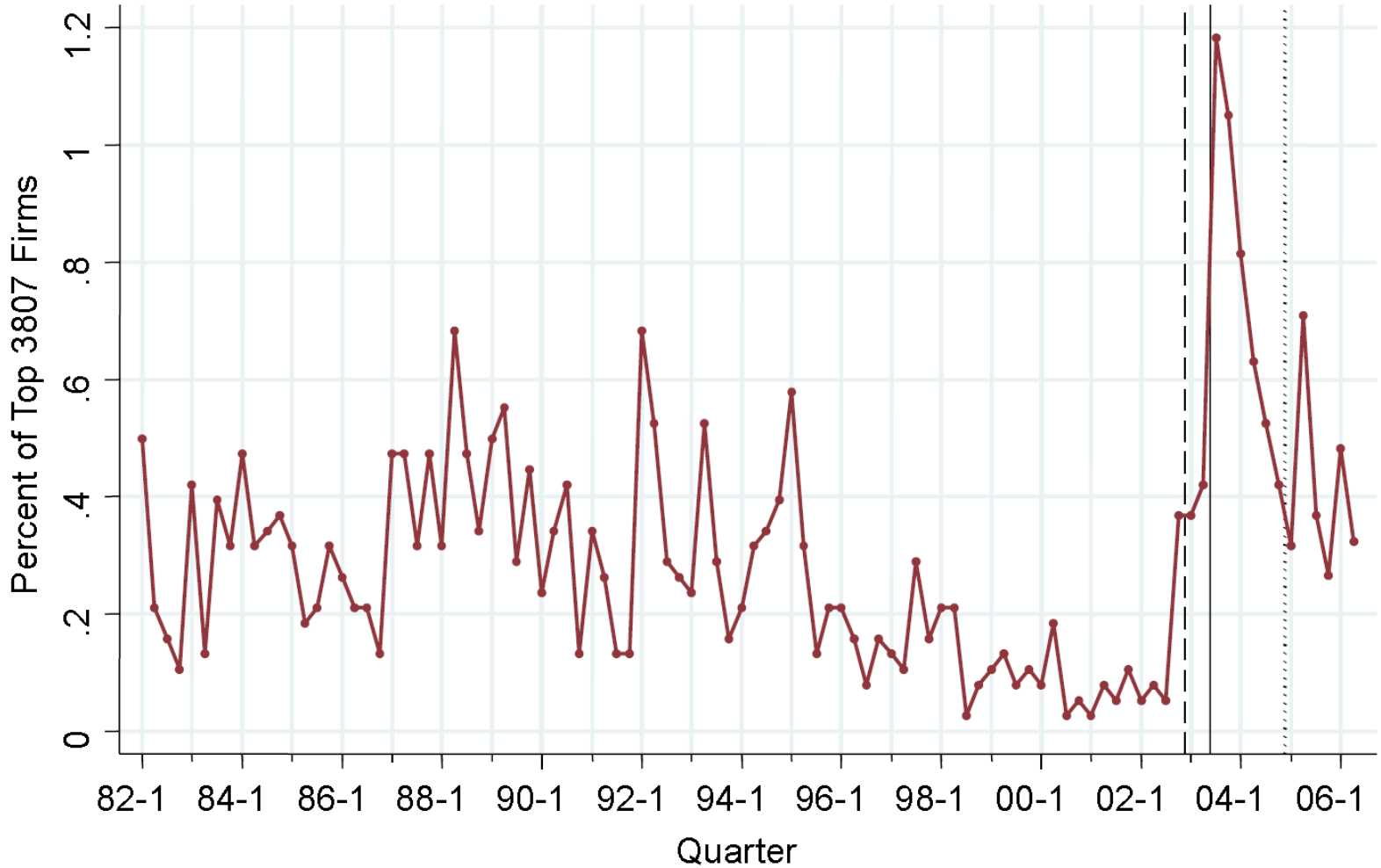
- **Data**
  - Data on dividend payments up to the second quarter of 2004 from the Center for Research in Security Prices (CRSP)
- **Results**
  - Large increase in dividend payouts : + 20% (+$20 bn p.a)
  - It implies an elasticity of regular dividend payments with respect to the marginal tax rate on dividend income of -0.5.
  - Largest response from firms with strong principals whose tax incentives changed (CEO with large dividends payout, large taxable shareholder, etc.)

Figure 24 – Dividend payments : aggregate time series



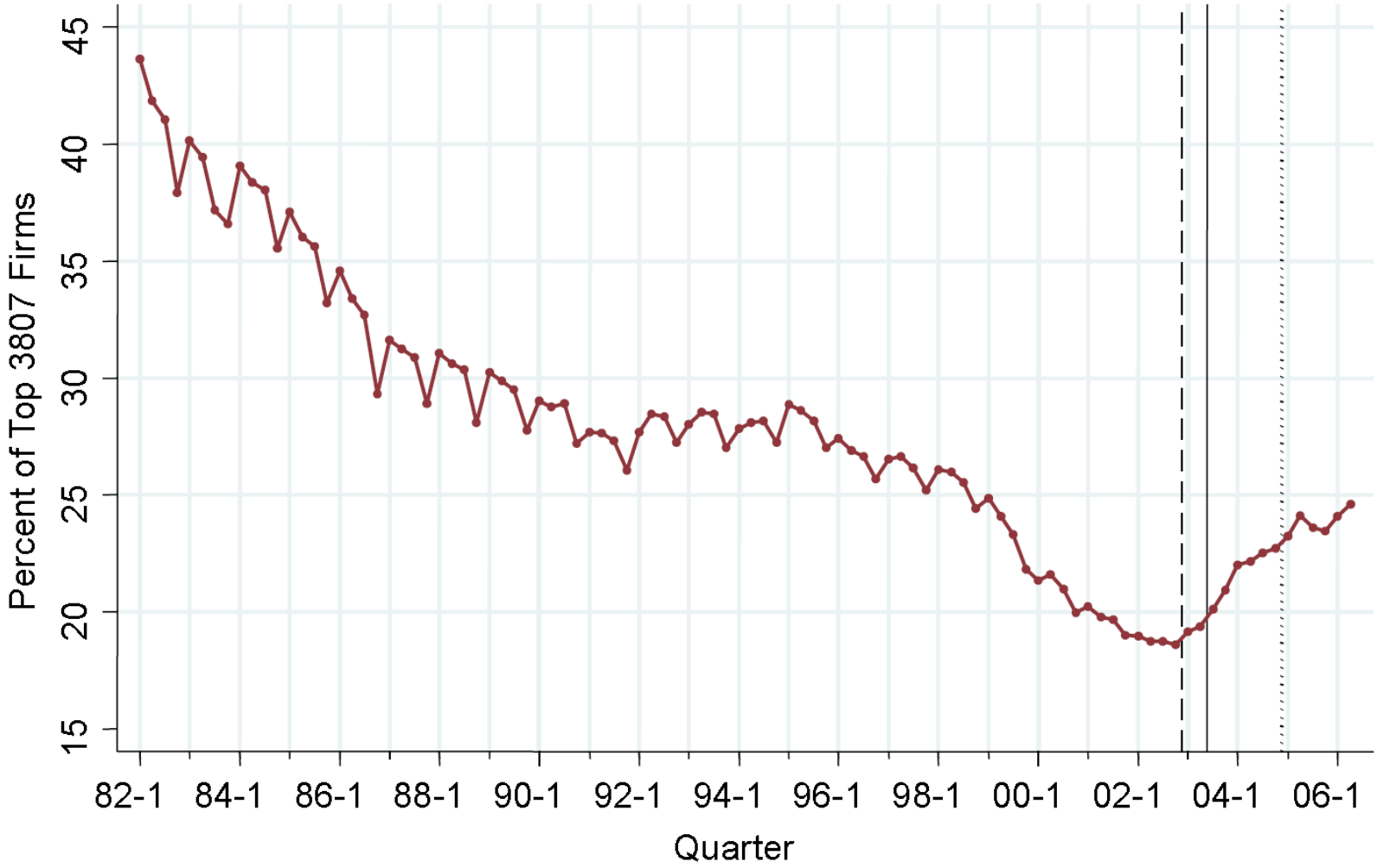
SOURCE : Chetty and Saez (2005), Fig. 1, slides from Chetty 2012.

Figure 25 – Regular dividend initiation time series



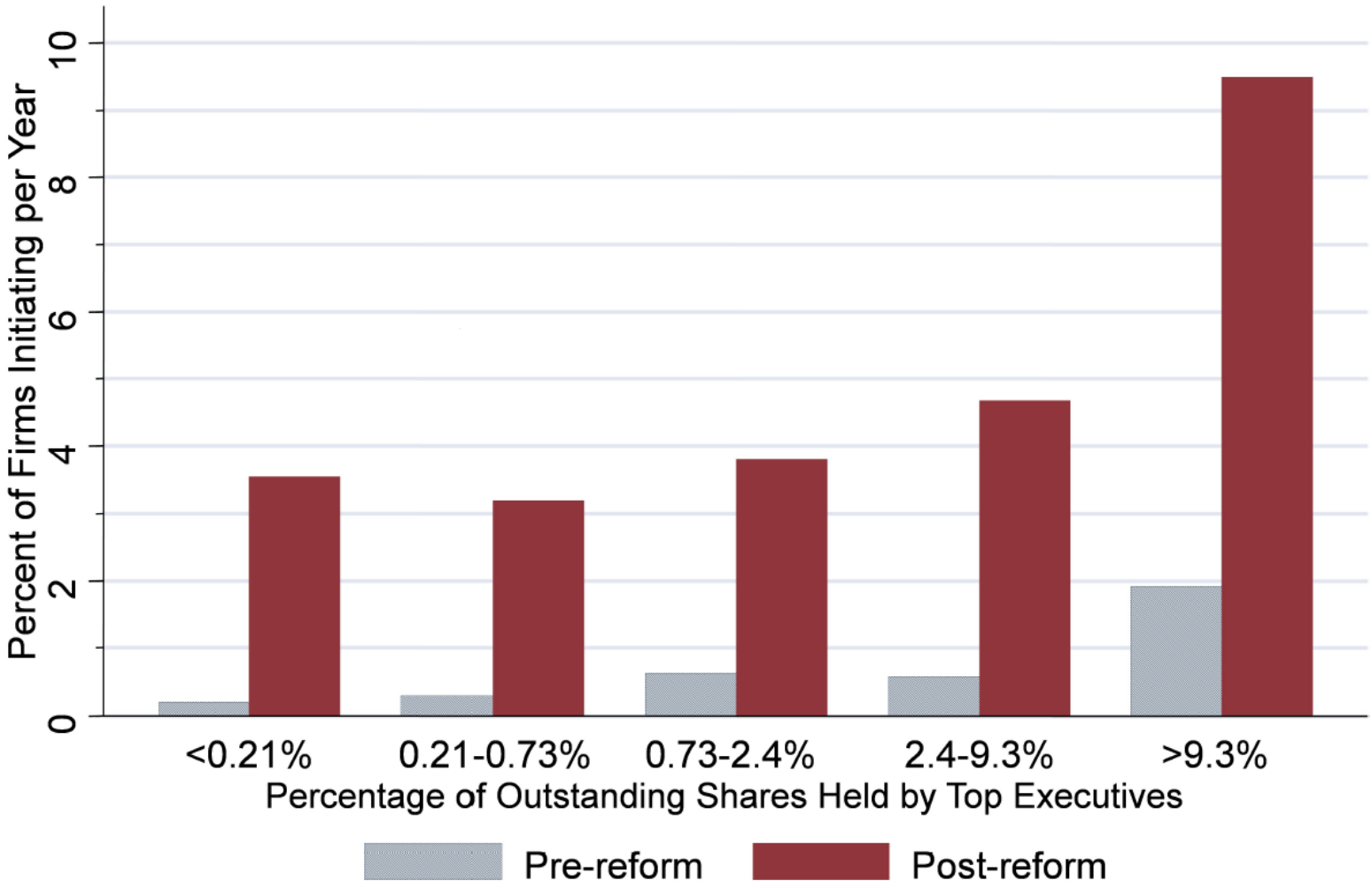
SOURCE : Chetty and Saez (2005), Fig. 2, slides from Chetty 2012.

Figure 26 – Fraction of dividend payers



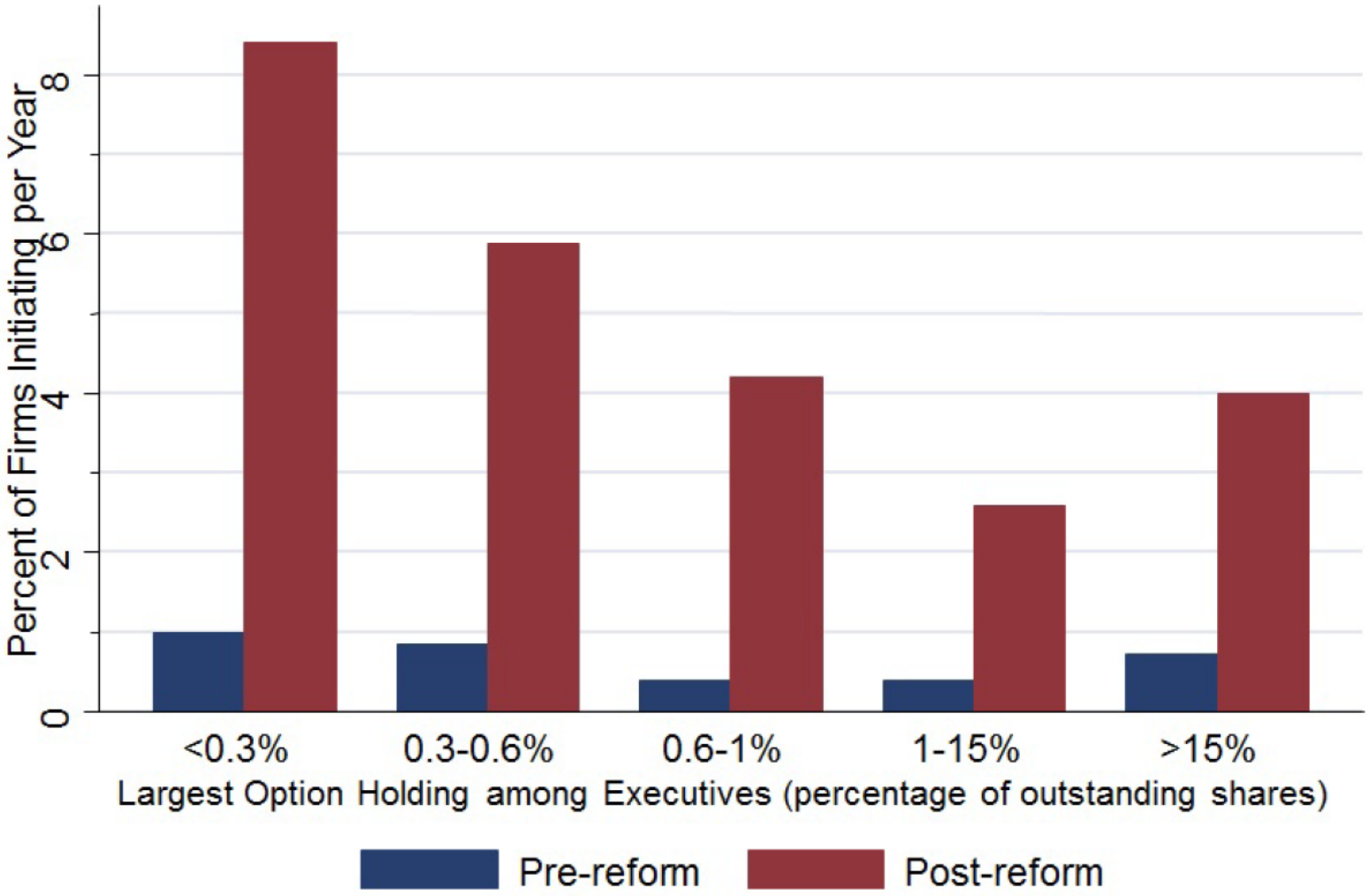
SOURCE : Chetty and Saez (2005), Fig. 3, slides from Chetty 2012.

Figure 27 – Effect of tax cut on initiations by executive shareholding



Source : Chetty and Saez (2005), Fig. 7, slides from Chetty 2012.

Figure 28 – Effect of tax cut on initiations by executive option holding



SOURCE : Chetty and Saez (2005), Fig. 7, slides from Chetty 2012.

Impact of dividend tax cuts

- **Chetty and Saez (2005) : take-away**
  - Significant impact of dividend tax cut on dividends
  - In line with the "old view"
  - But the dividend response appears too fast to be consistent with the old view mechanism
    i.e., savings supply side response $\Rightarrow$ more business activity and higher dividend payments
  - Temporary dividend tax cut could also be in line with new view
  - Chetty-Saez results consistent with positive, negative, or zero effect on investment
- **Supportive of agency models of dividend payout**
  - Suggestive of agency issues matter for dividend behaviours

Yagan (AER, 2015)

- **Main idea**
  - Look at the effect of U.S. dividend tax cut in 2003 on investments
  - Impact on investment would confirm the "old view"

Yagan (AER, 2015)

- **Main idea**
  - Look at the effect of U.S. dividend tax cut in 2003 on investments
  - Impact on investment would confirm the "old view"
- **Results**
  - Zero effect on investment : reject traditional view
  - Zero effect on wages
  - Challenges leading estimates of user cost-of-capital elasticities w.r.t. to investments

Yagan (AER, 2015)

- **Methodology : DiD**
  - DiD using C-corporations vs. S-corporations
  - C-corps : pay CIT, shareholders pay dividend taxes, capital gains taxes on qualified share buybacks
  - S-corps : same legal structure but taxable income flows through shareholders individual tax returns (independent on whether it is retained or distributed)

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- **Methodology : DiD**
  - DiD using C-corporations vs. S-corporations
  - C-corps : pay CIT, shareholders pay dividend taxes, capital gains taxes on qualified share buybacks
  - S-corps : same legal structure but taxable income flows through shareholders individual tax returns (independent on whether it is retained or distributed)

- **Identification assumption**
  - C- and S-corps are different : C-corps are much larger
  - For identification : only necessary that both firm types would have followed the same trend absent the reform
  - Check whether proper control groups

Figure 29 – C-corps vs. S-corps : Retail hardware chains

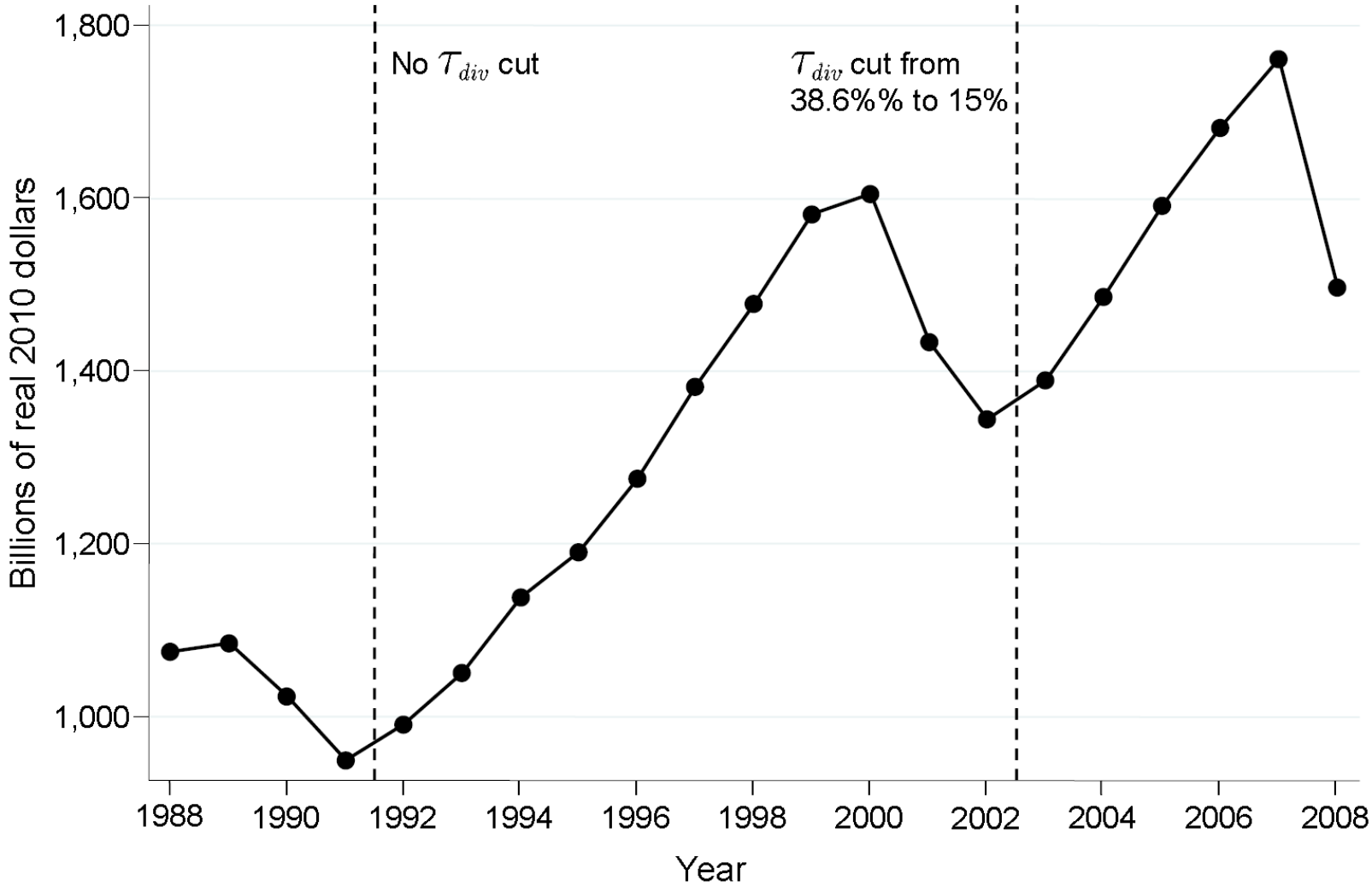
- Largest hardware chain
- C-corporation

- Third-largest hardware chain
- S-corporation

Source : Yagan (2015).

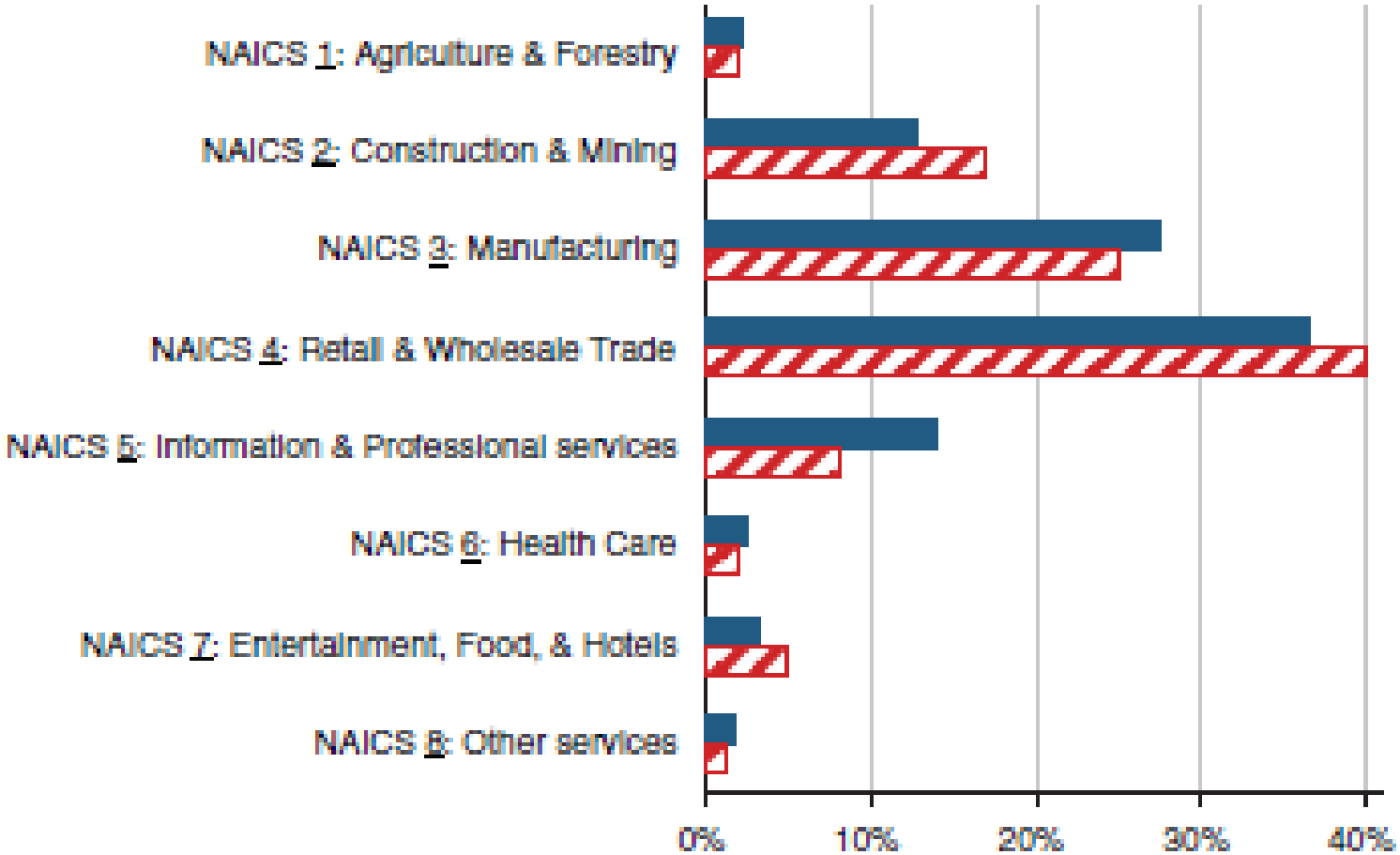
Figure 30 – C-corps vs. S-corps : Retail hardware chains

Figure 31 – U.S. corporate investment in national accounts



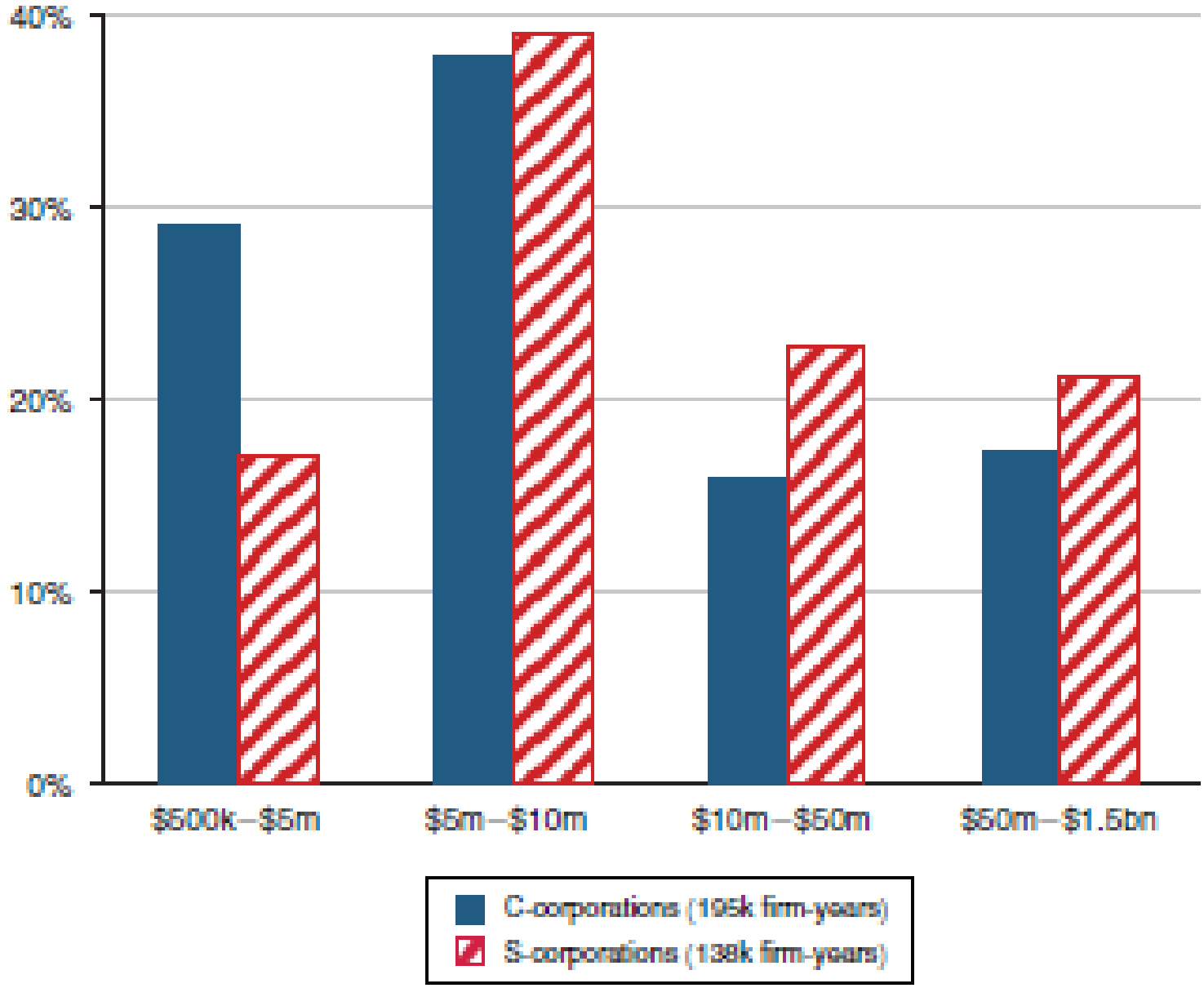
SOURCE : Yagan (2013).

Figure 32 – Control vs. treated : industry



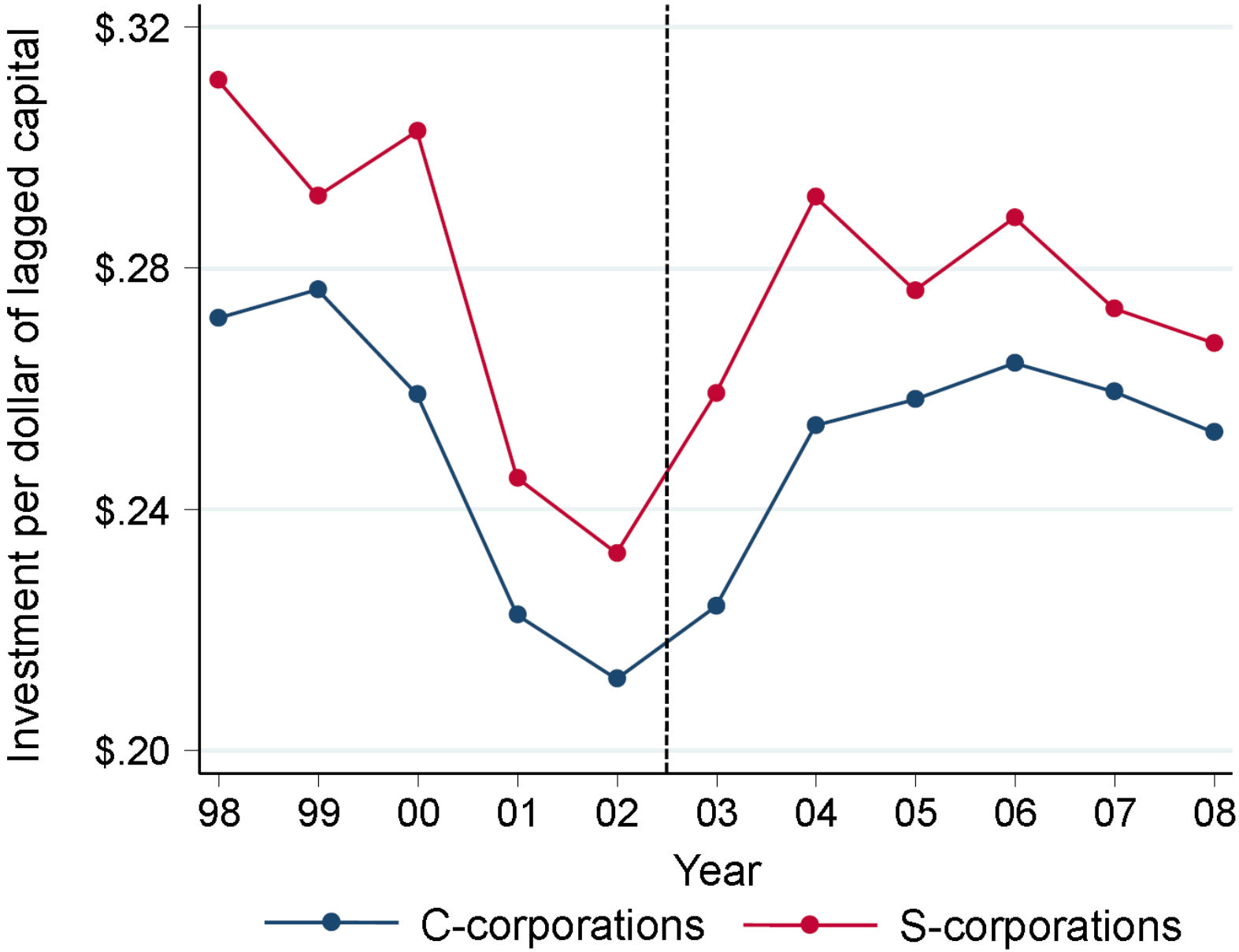
Source : Yagan (2015), Fig. 1.A

Figure 33 – Control vs. treated : size



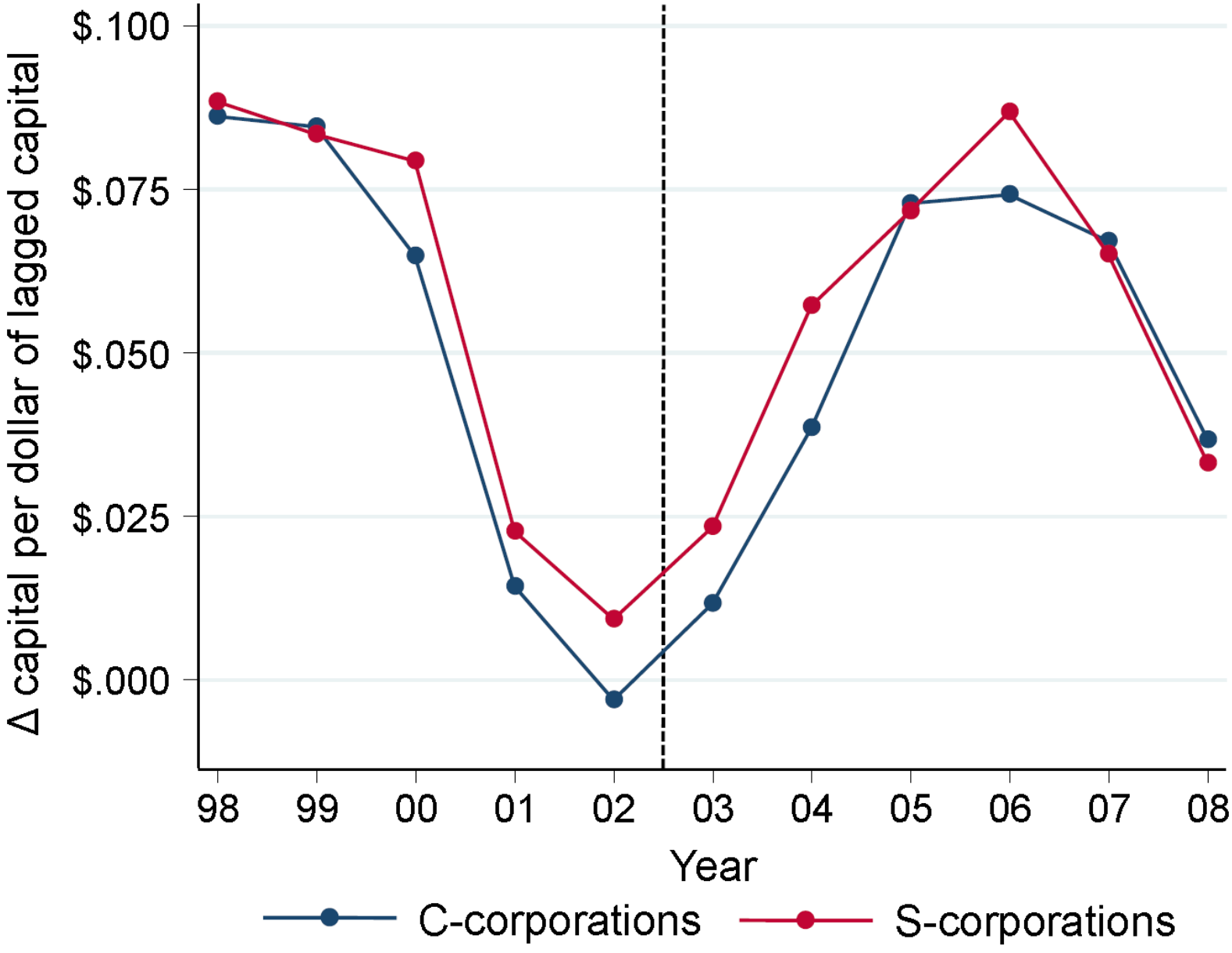
Source : Yagan (2015), Fig. 1.B

Figure 34 – Investment



Source : Yagan (2015), Fig. 2.A

Figure 35 – Net investment



Source : Yagan (2015), Fig. 2.B

Figure 36 – Employee compensation

Source : Yagan (2015), Fig. 2.C

Figure 37 – Effect of dividend tax cut on investment

Dependent variable:	Investment					
Dep. var. winsorized at:	95th percentile			99th percentile		
Panel:	Unbalanced		Balanced	Unbalanced		Balanced
	($ per lagged capital)		($ per 96–97 cap.)	($ per lagged capital)		($ per 96–97 cap.)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Investment						
C-Corp × Post-2003	0.0008	−0.0002	−0.0063	−0.0104	−0.0118	−0.1884
	(0.0044)	(0.0042)	(0.0226)	(0.0068)	(0.0066)	(0.1483)
Lagged controls		X			X	
Firm FE's			X			X
Observations (firm-years)	333,029	333,029	85,624	333,029	333,029	85,624
Clusters (firms)	73,188	73,188	7,784	73,188	73,188	7,784
R^2	0.01	0.07	0.53	0.01	0.05	0.55
Pre-2003 C-corp mean	0.2428	0.2428	0.2939	0.2828	0.2828	0.3682
Pre-2003 C-corp SD	0.2514	0.2514	0.3070	0.4181	0.4181	0.6478
Implied ε wrt $(1 - \tau_{div})$	0.01	0.00	−0.05	−0.09	−0.10	−1.18
	[−0.08, 0.09]	[−0.08, 0.08]	[−0.4, 0.3]	[−0.19, 0.02]	[−0.2, 0.01]	[−3.01, 0.64]

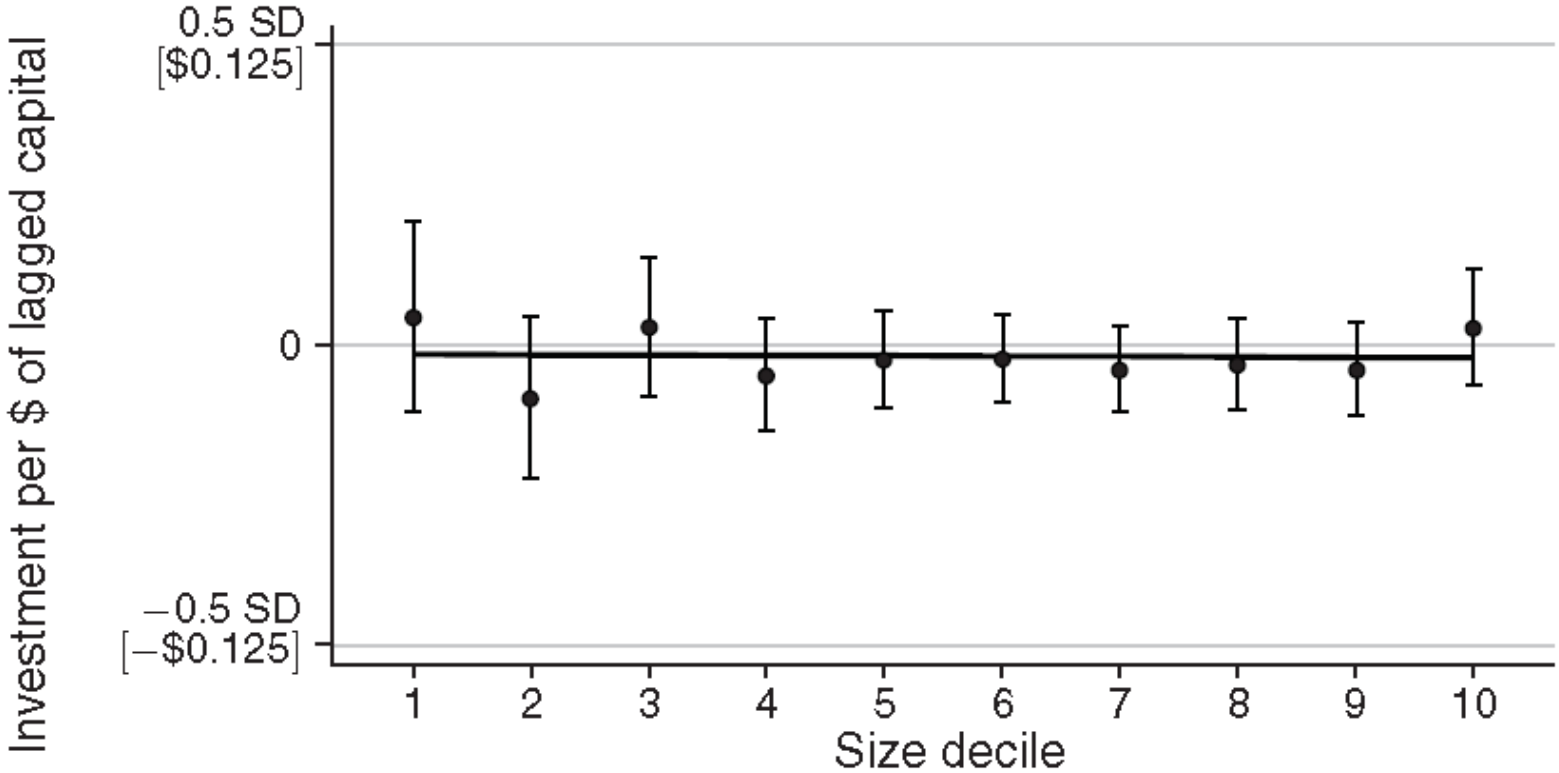
SOURCE : Yagan (2015), Tab. 2.A

Figure 38 – Effect on net investment and employee compensation

Dependent variable:	Net investment			Employee compensation		
Dep. var. winsorized at:	95th percentile					
Panel:	Unbalanced		Balanced	Unbalanced		Balanced
	($ per lagged capital)		($ per 96–97 cap.)	($ per lagged revenue)		($ per 96–97 rev.)
	(7)	(8)	(9)	(10)	(11)	(12)
B. Net investment and employee compensation						
C-Corp × Post-2003	0.0048	0.0042	−0.0110	−0.0013	−0.0013	0.0083
	(0.0041)	(0.0039)	(0.0116)	(0.0025)	(0.0020)	(0.0062)
Lagged controls		X			X	
Firm FE's			X			X
Observations (firm-years)	333,029	333,029	85,624	333,029	333,029	85,624
Clusters (firms)	73,188	73,188	7,784	73,188	73,188	7,784
R^2	0.01	0.04	0.20	0.00	0.37	0.87
Pre-2003 C-corp mean	0.0421	0.0421	0.0885	0.1647	0.1647	0.1727
Pre-2003 C-corp SD	0.2541	0.2541	0.2732	0.1415	0.1415	0.1450
Implied ε wrt $(1 - \tau_{div})$	0.26	0.23	−0.29	−0.02	−0.02	0.11
	[−0.18, 0.71]	[−0.19, 0.66]	[−0.88, 0.3]	[−0.09, 0.05]	[−0.07, 0.04]	[−0.05, 0.27]

SOURCE : Yagan (2015), Tab. 2.B

Figure 39 – Effect on investment by size decile



Source : Yagan (2015), Fig. 3.A

Yagan (AER, 2015)

- **Results**
  - 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 (AER, 2015)

- **Results**
  - 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)

- **Possible interpretations**
  1. New view is correct and most firms fund marginal investments out of retained earnings (e.g., median U.S. firm is 22 years old)
  2. Traditional view is technically correct, but tax code features blocked effects
     - Low expected permanence (originally set to expire in 2009)

Alstadsæter, Jacob and Michaely (JPuBE, 2017)

- **Sweden's 2006 dividend tax cut**
  - Cut of 10 ppt for closely held corporations
  - Cut of 5 ppt for widely help corporations

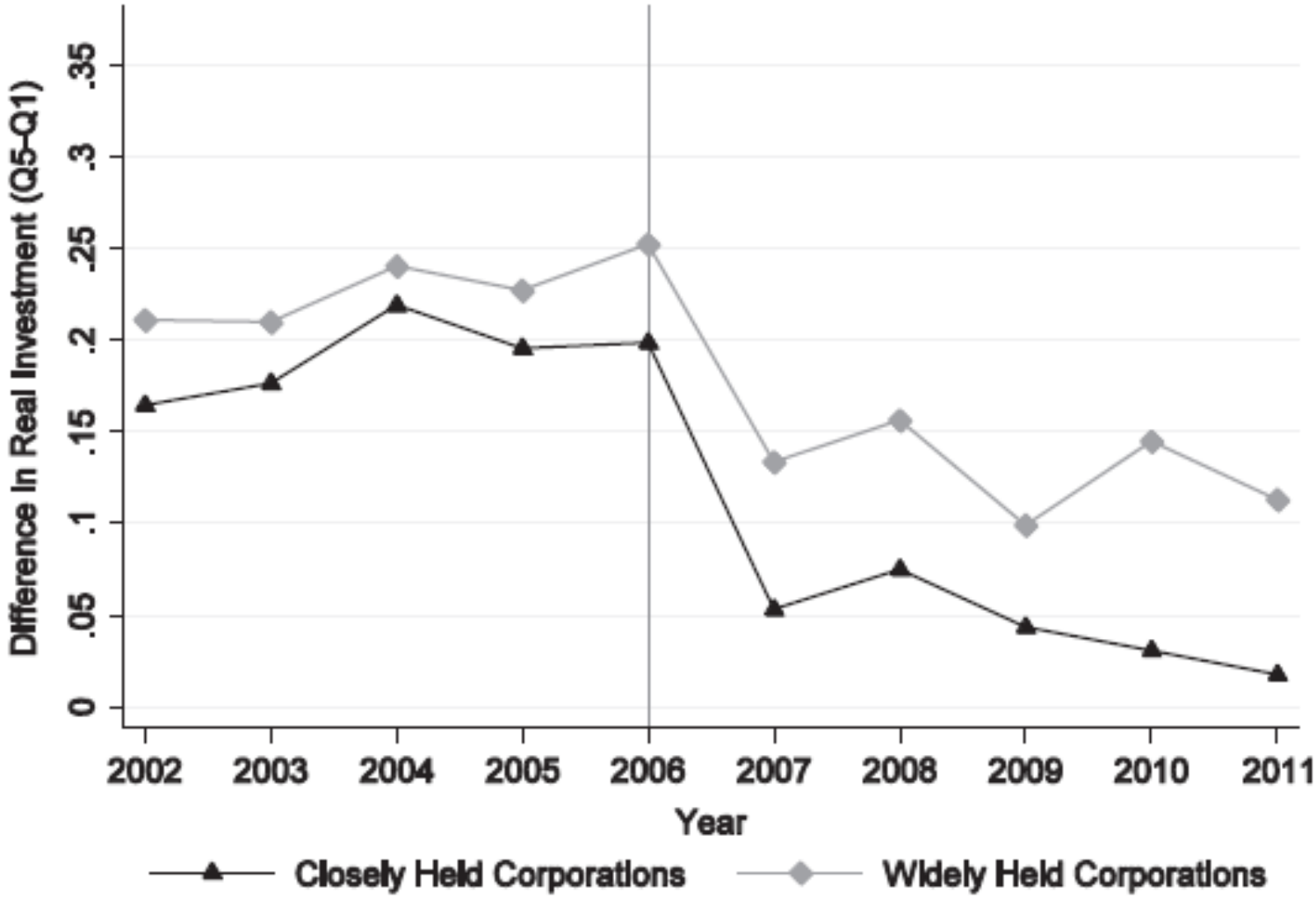
Alstadsæter, Jacob and Michaely (JPuBE, 2017)

- **Sweden's 2006 dividend tax cut**
  - Cut of 10 ppt for closely held corporations
  - Cut of 5 ppt for widely help corporations
- **Empirical strategies**
  1. DiD between cash-constrained firms/cash-rich closely held firms
  2. DiD between cash-constrained firms/cash-rich widely held firms
  3. DDD between DD closely/widely held firms

Alstadsæter, Jacob and Michaely (JPuBE, 2017)

- **Results**
  - Cash-constrained firms increase their investment relative to cash-rich firms
    - closely held : +32% increase in investment
    - widely held : +18% increase
  - No aggregate impact on investment
    - no difference of investment between closely/widely held firms

Figure 40 – Difference in investment between high-cash and low-cash firms, 2002–2011.



Source : Alstadsæter, et al. (2017), Fig. 1.

Figure 41 – Dividend taxes and corporate investment, 2002–2011.

	Pre-Reform 2002–2005	Post-Reform 2006–2011	Time difference for group	Estimates with controls and FE
	(1)	(2)	(3)	(4)
Panel A: closely held corporations—10-percentage-point dividend tax cut				
Cash-poor firms	−0.1287	−0.0624	0.0663***	
			(0.0062)	
Cash-rich firms	0.1150	0.0554	−0.0596***	
			(0.0075)	
Difference cash-poor–cash-rich in *t*	−0.2436***	−0.1178***		
	(0.0070)	(0.0073)		
DD estimate	0.1259***			0.1495***
	(0.0098)			(0.0122)
Panel B: widely held corporations—5-percentage-point dividend tax cut				
Cash-poor firms	−0.1576	−0.1181	0.0395***	
			(0.0091)	
Cash-rich firms	0.1241	0.1024	−0.0217*	
			(0.0125)	
Difference cash-poor–cash-rich in *t*	−0.2817***	−0.2205***		
	(0.0117)	(0.0114)		
DD estimate	0.0612***			0.0833***
	(0.0155)			(0.0257)
Panel C: difference between closely held corporations and widely held corporations				
DDD estimate	0.0647***			0.0602***
	(0.0184)			(0.0220)

SOURCE : Alstadsæter, et al. (2017), Tab. 3.

Figure 42 – Dividend taxes and corporate investment, overall investment effect.

	Baseline result	Quartile split	Tercile split	Top 40% vs. bottom 40%	Median split
*Reform * CHC*	0.0144	0.0148	0.0141	0.0006	0.0006
	(0.0127)	(0.0115)	(0.105)	(0.0095)	(0.0084)
Controls & FE	Yes	Yes	Yes	Yes	Yes
Observations	353,272	451,129	632,682	738,400	943,346
R-squared	0.1968	0.1949	0.2216	0.1943	0.1953

SOURCE : Alstadsæter, et al. (2017), Tab. 4.

Alstadsæter, Jacob and Michaely (JPuBE, 2017)

- **Explanations for this reallocation**
  1. Cash-constrained firms raise more external equity
  2. Higher dividend payouts from cash-rich firms

- **Take-away message**
  - Heterogenous investment response in line with theory from Chetty and Saez (2010)
  - "High dividend taxation appears to lock in funds in cash-rich firms, more so than in cash-constrained firms (...) Dividend taxation effectively creates a wedge between the cost of internal equity and the cost of external equity"
  - "however a dividend tax reduction potentially comes at the cost of income shifting across tax bases"

Bach, Bozio, Guillouzouic, Leroy and Malgouyres (2024)

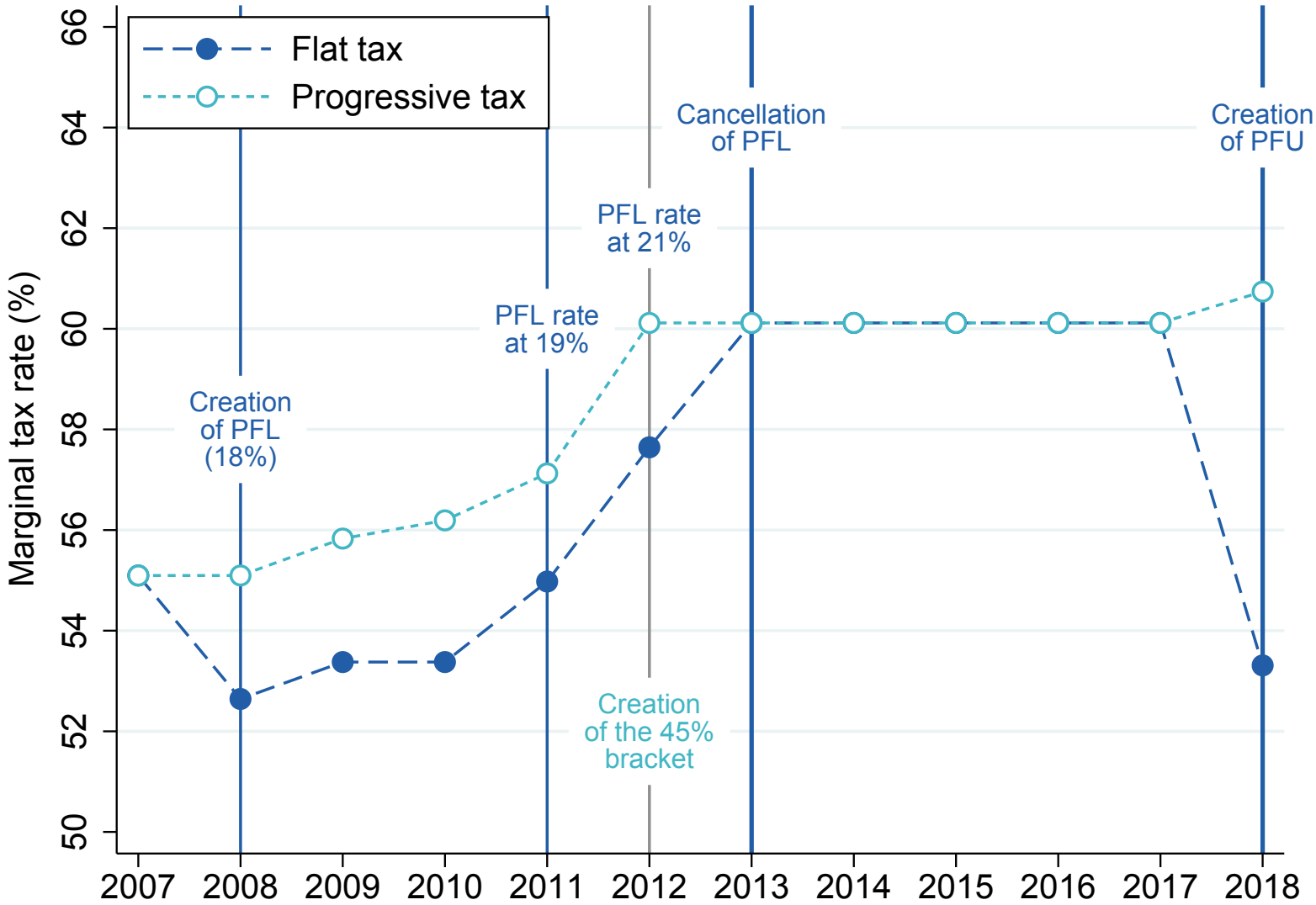
- **We exploit two reforms of dividend taxation in France**
  - A tax *increase* in 2013 (flat-tax cancellation)
  - A tax *decrease* in 2018 (flat-tax creation)
- **We use new, exhaustive and rich administrative data**
  - All households' personal income tax returns
  - All firms' corporate income tax returns
- **Contributions**
  1. Measure both household and firm-level responses
  2. Decompose firm-level responses
  3. Analyze asymmetry of the effect

Dividend taxation in France

- **Dividends are taxed in several steps**
  1. Corporate income tax (*"impôts sur les sociétés"*)
  2. Withholding flat social contributions (*"prélèvements sociaux"*)
  3. Personal income tax (*"impôt sur le revenu"*)

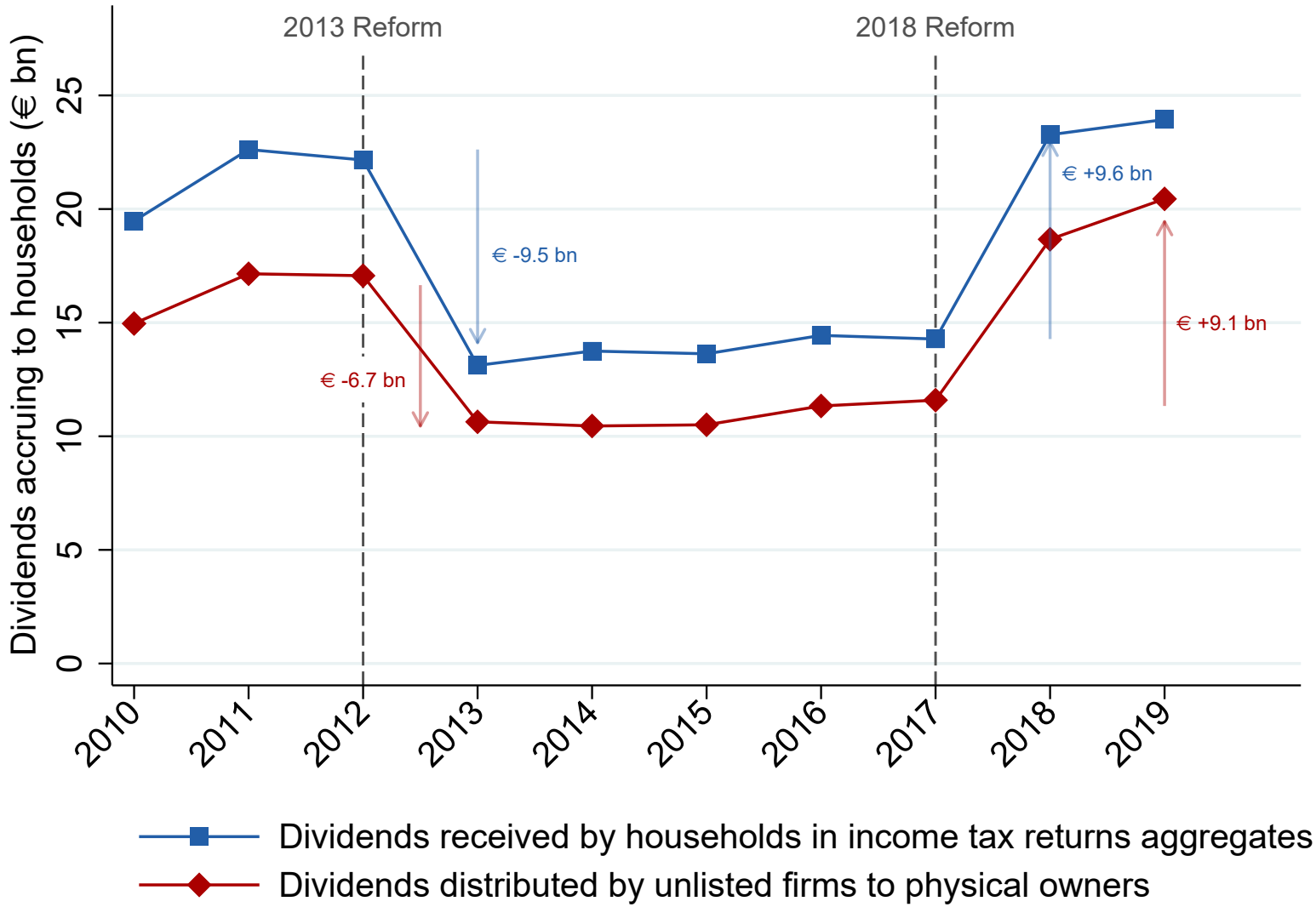
- **Several reforms of the personal income tax part in recent years**
  - From 2008 to 2012, taxpayers had the choice between two tax regimes for dividends
    - The global progressive income tax schedule (*"Barème"*)
    - A specific capital income flat tax (*"PFL"*)
  - In 2013, the flat tax option was removed (*"barèmisation"*)
  - In 2018, a flat tax was reintroduced (*"PFU"*)

Figure 43 – Top marginal tax rate on dividends (CIT included, 2007–2018)



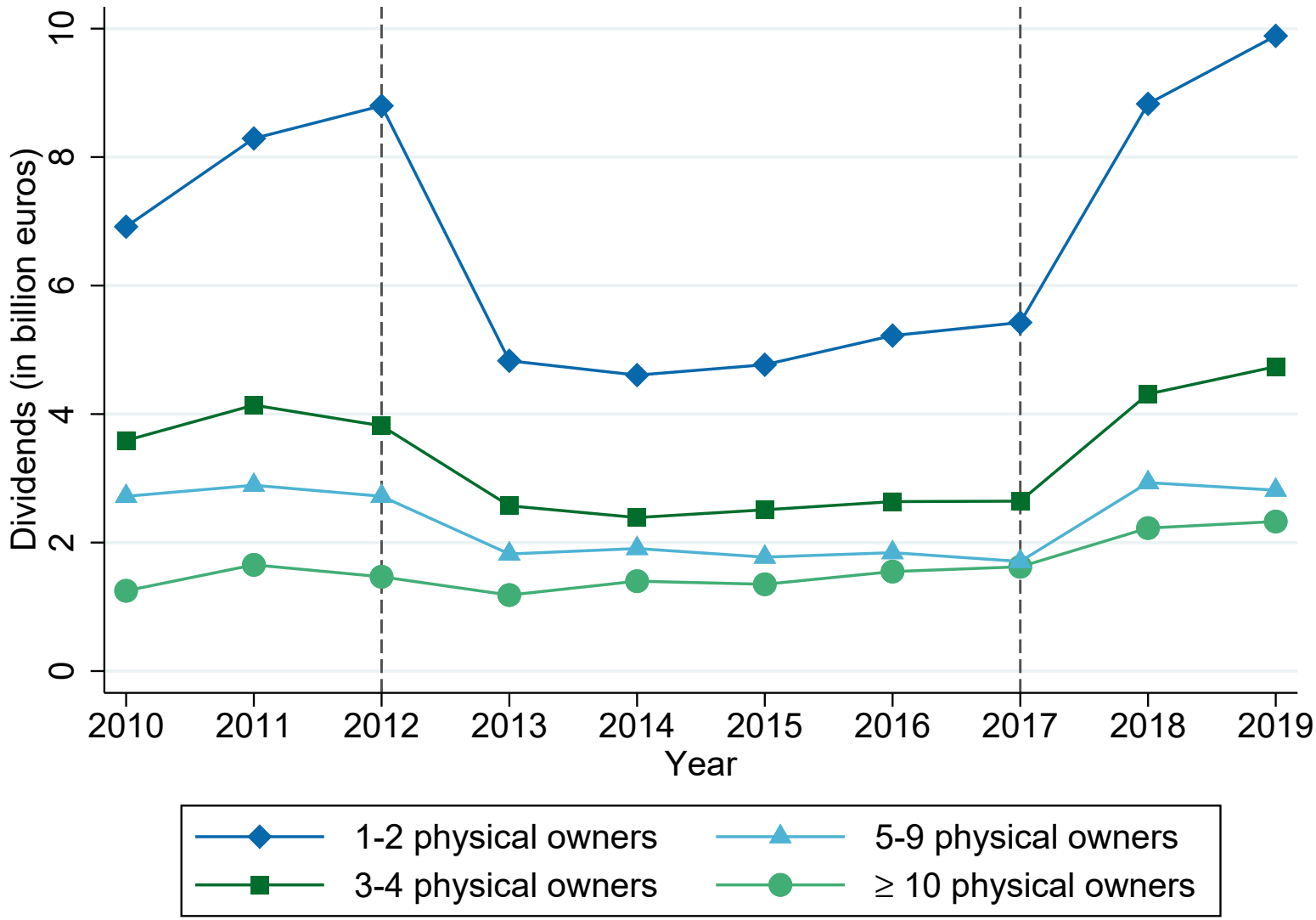
Source : Bach, et al. (2020).

Figure 44 – Aggregate dividends received by households (2000–2019)



Source : Bach, et al. (2021).

Figure 45 – Dividends distributed by unlisted firms, by number of physical owners



Source : Bach, et al. (2021).

Empirical Strategy at household level

- **The identification challenge**
  - Pre-reform taxable income does not capture potential treatment
  - Dividend payout can be triggered by tax reform for households with firm control
  - Low taxable income can be compatible with high exposure to the reform $\Rightarrow$ one should not compare high income vs low income including dividend income pre-reform
- **Defining potentially treated**
  - Pre-reform income should exclude dividends to measure exposure to the reforms
  - Firm ownership is key variable to be potentially exposed to dividend taxation

Empirical Strategy at household level

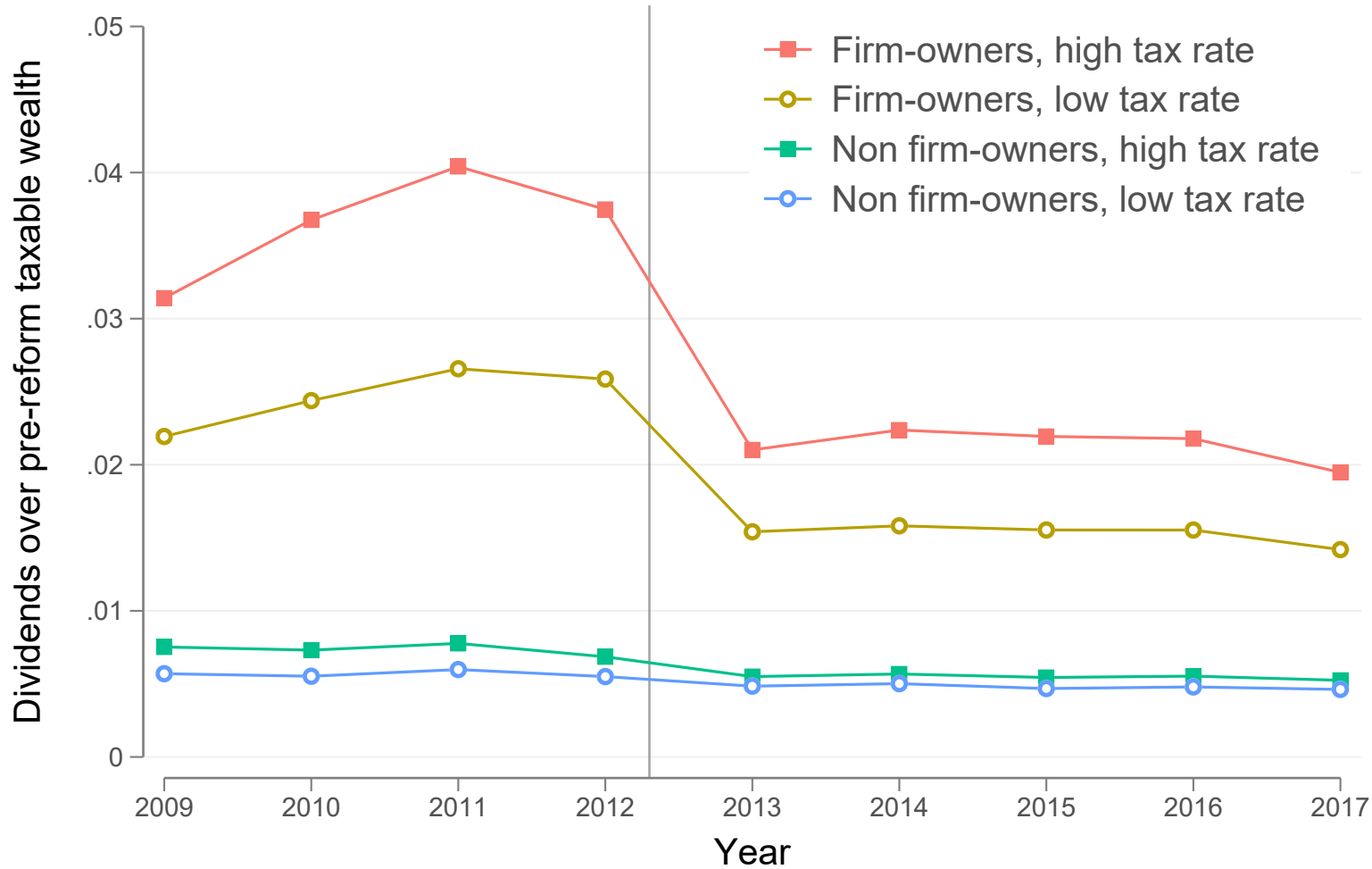
- **Treatment based on tax incentives**
  - We define groups according to pre-reform non-dividend income (earnings + pensions + real-estate income)

    Treated : Households with high marginal income tax rate
    $\hookrightarrow$ affected by flat-tax introduction/removal

    Control : Households with low marginal income tax rate

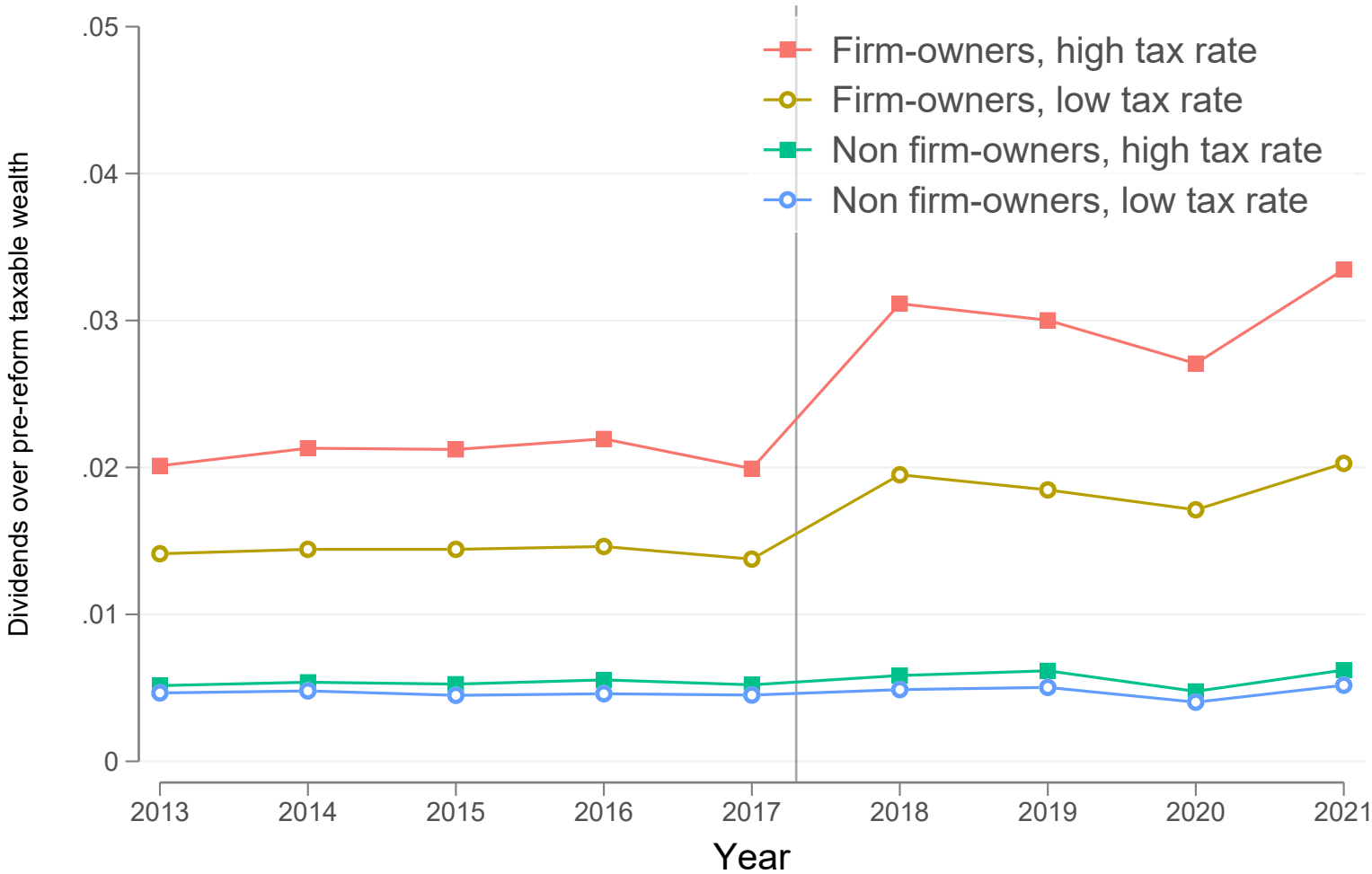
- **Apply separately the identification to firm owner and not owners**

Figure 46 – Effect of 2013 reform on dividends – Raw data



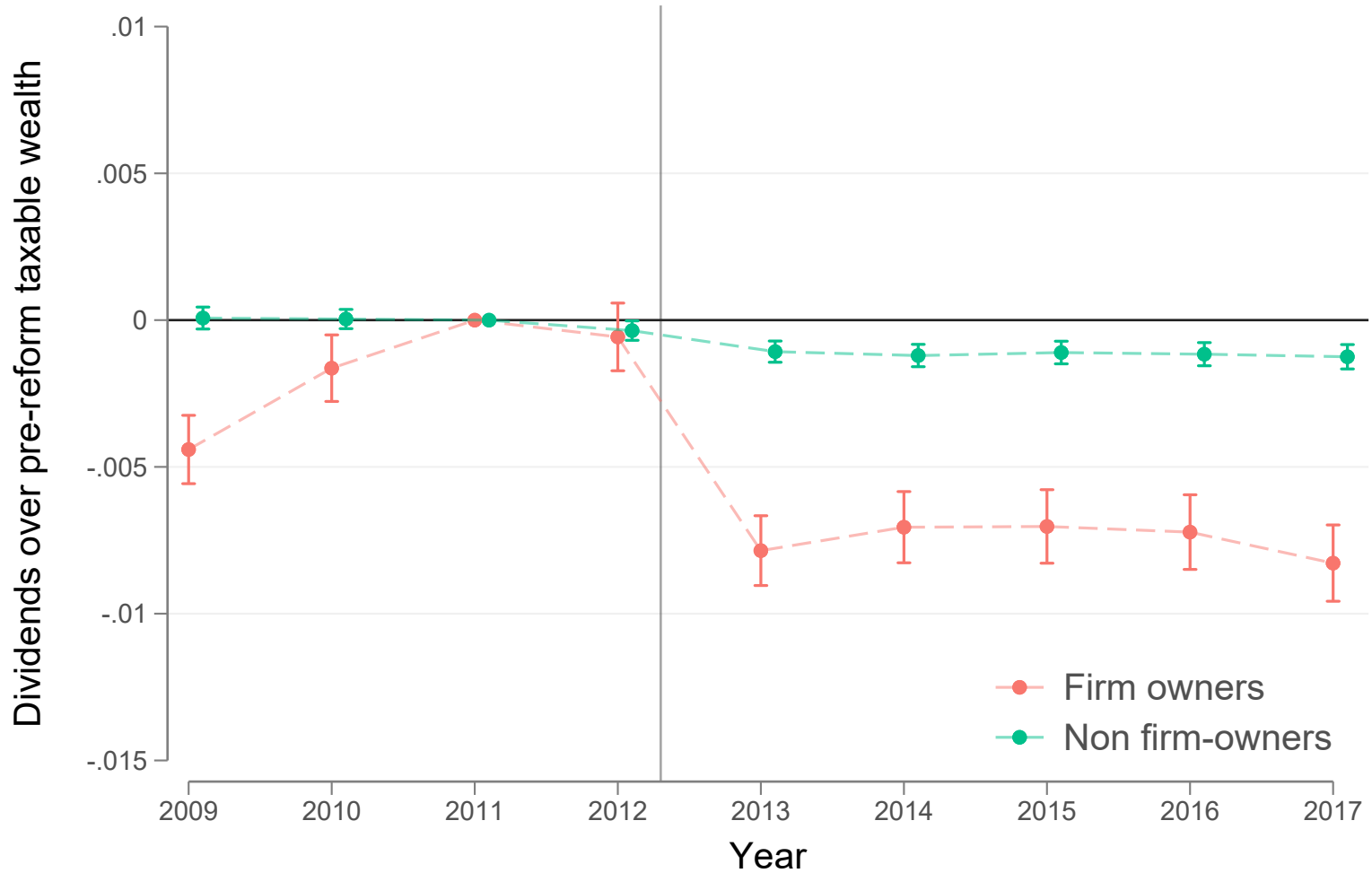
SOURCE : Bach, et al. (2024).

Figure 47 – Effect of 2018 reform on dividends – Raw data



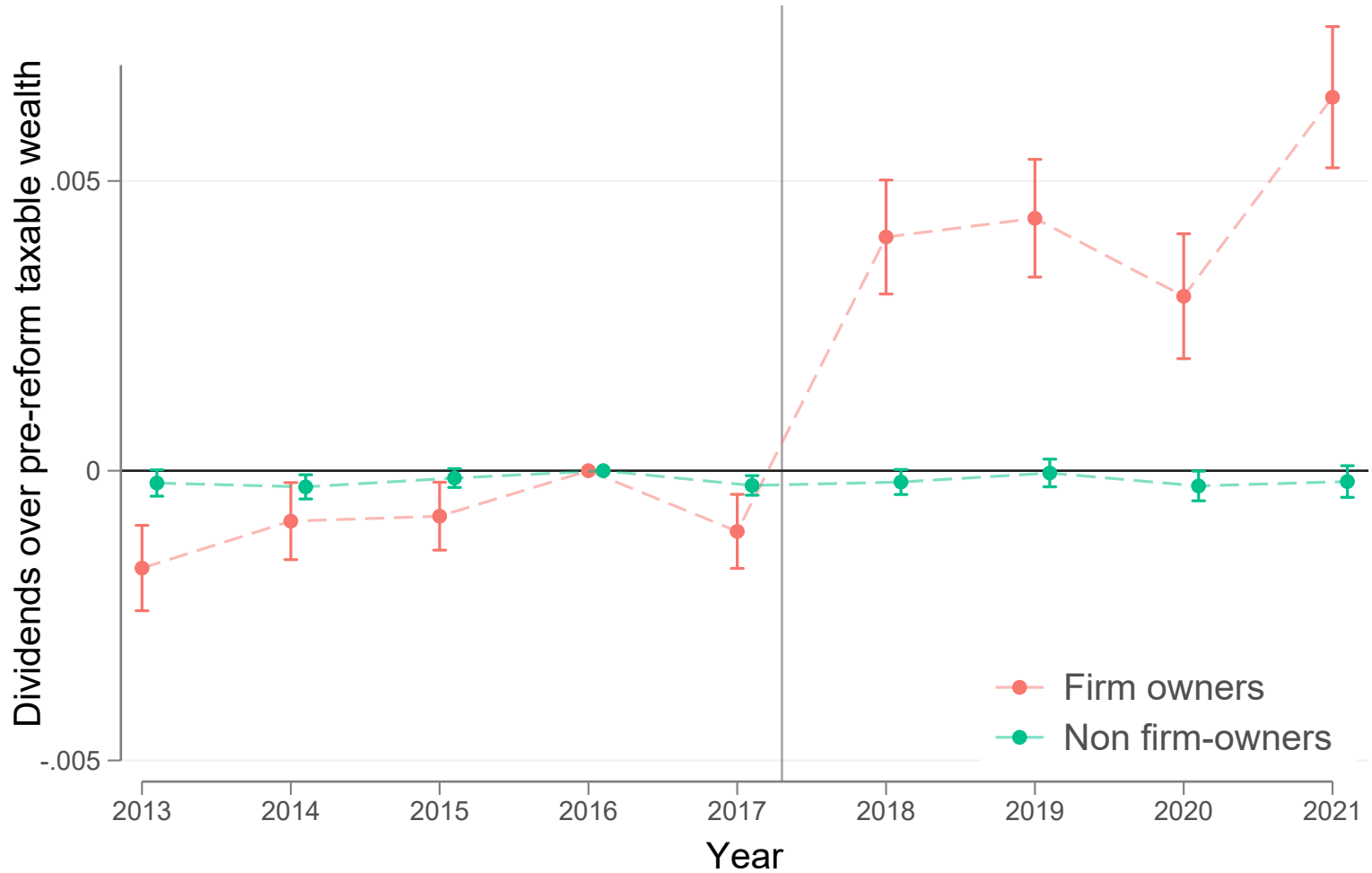
Source : Bach, et al. (2024).

Figure 48 – Effect of 2013 reform on dividends – DiD



Source : Bach, et al. (2024).

Figure 49 – Effect of 2018 reform on dividends – DiD



Source : Bach, et al. (2024).

Household-level responses to dividend taxation

- **Dividend income very elastic but only for shareholders with firm control**
  - Elasticity in 2018 $\simeq$ 0.2-0.3 $\Rightarrow$ for households without firm control
  - Elasticity in 2018 $\simeq$ 2 $\Rightarrow$ for those with firm control
- **How did households respond ?**
  - No sizeable income shifting
  - No portfolio reallocation

  $\Rightarrow$ Look for responses *within* the firm

Empirical Strategy

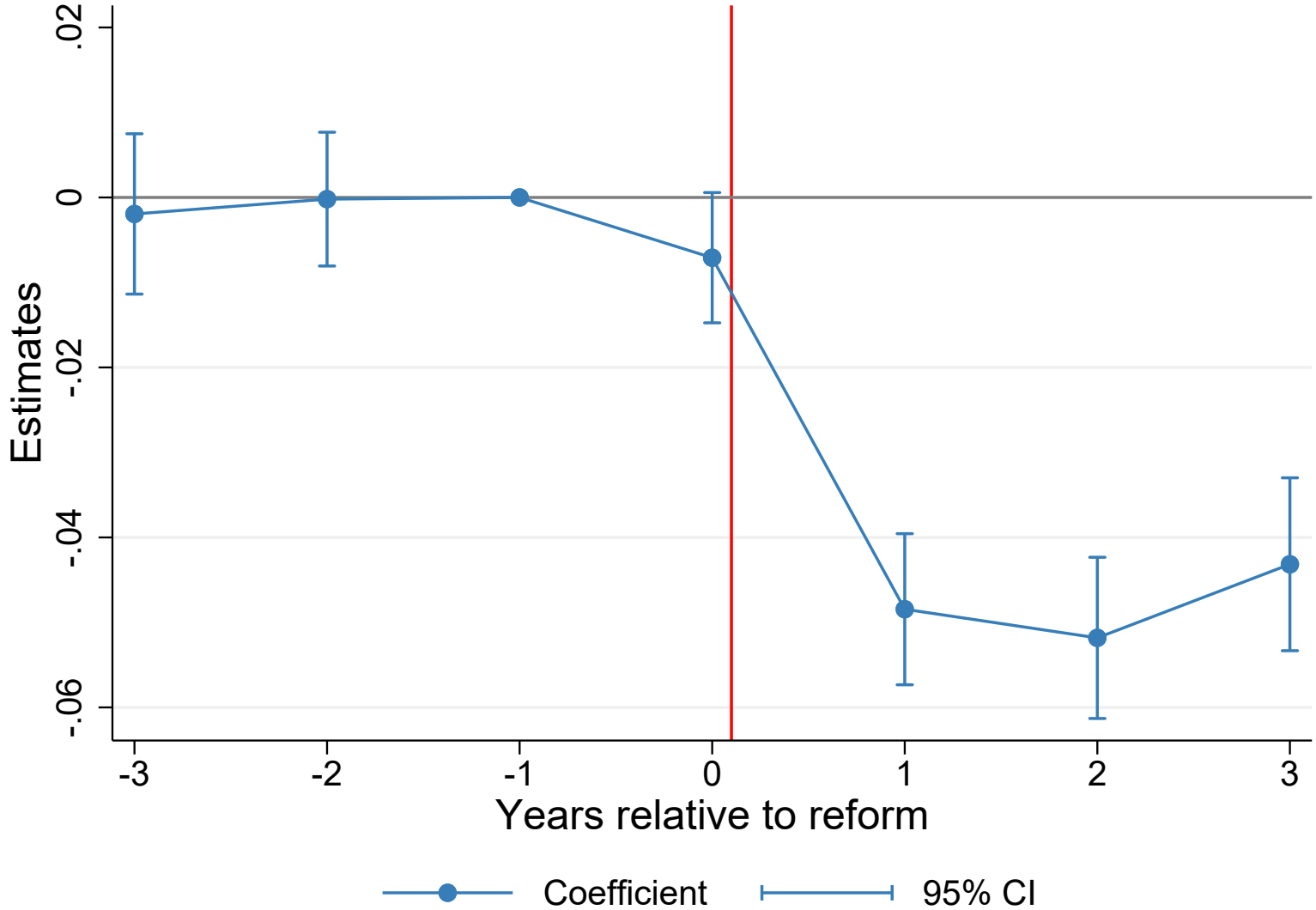
- **Group definition at the firm level**
  - Treated = firms entirely owned by private persons
  - Control = firms owned at least at 50% by legal entities

  $\Rightarrow$ Intent-to-treat estimates : compares firms with *shareholders likely to be affected and able to respond* to ones *unlikely to be affected and unable to respond*.

- **Our estimation sample :**
  - Keeps companies whose financial year closes on Dec. the 31st
  - Excludes listed firms, micro enterprises and SARL with an owner-manager
  - Firms present in 2011 and 2012
  - Sample of 28,182 firms

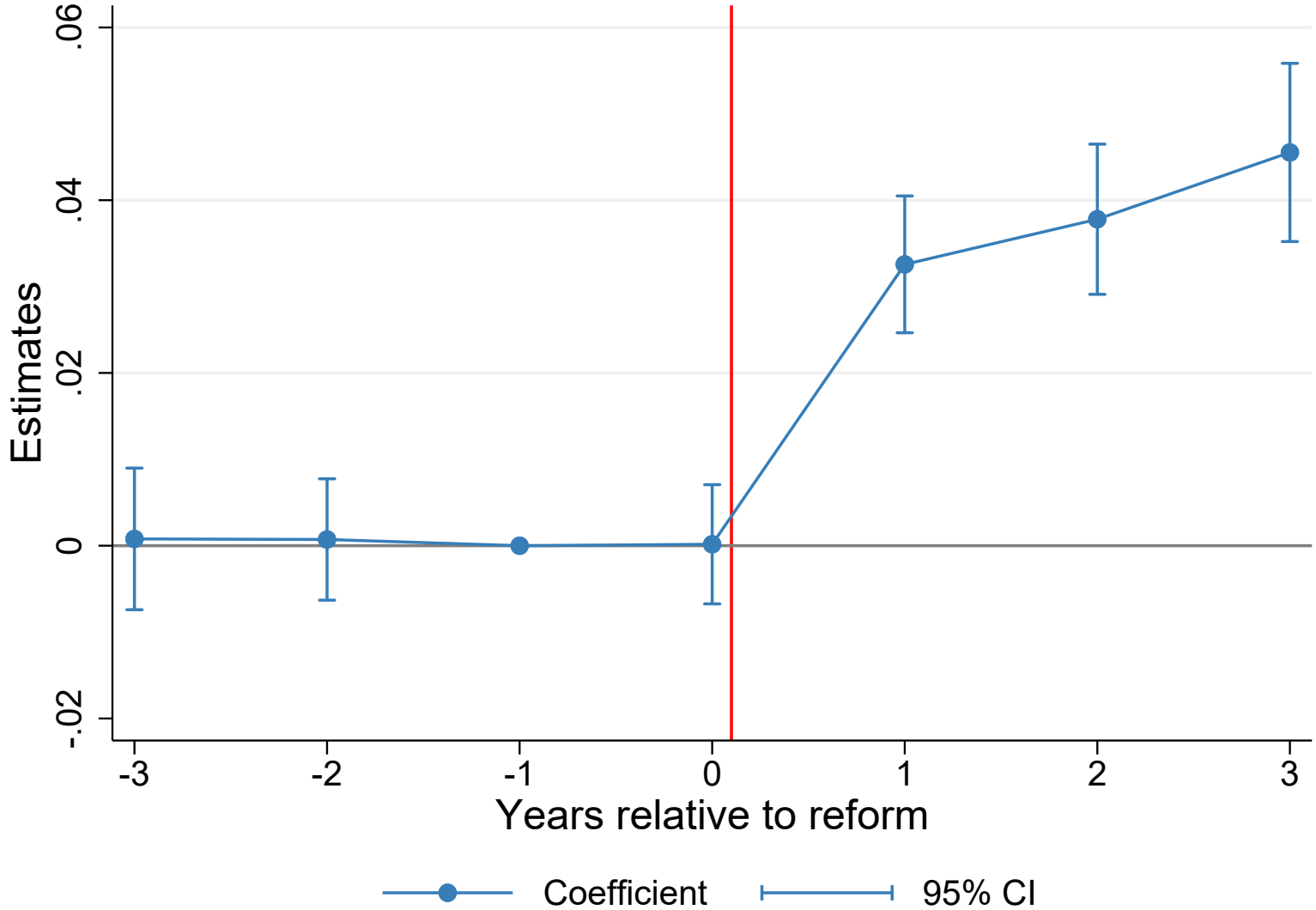
- **Estimate both dynamic and static diff-in-diff coefficients**

Figure 50 – 2013 Reform, DiD estimates (Dividends>0) – SAS firms



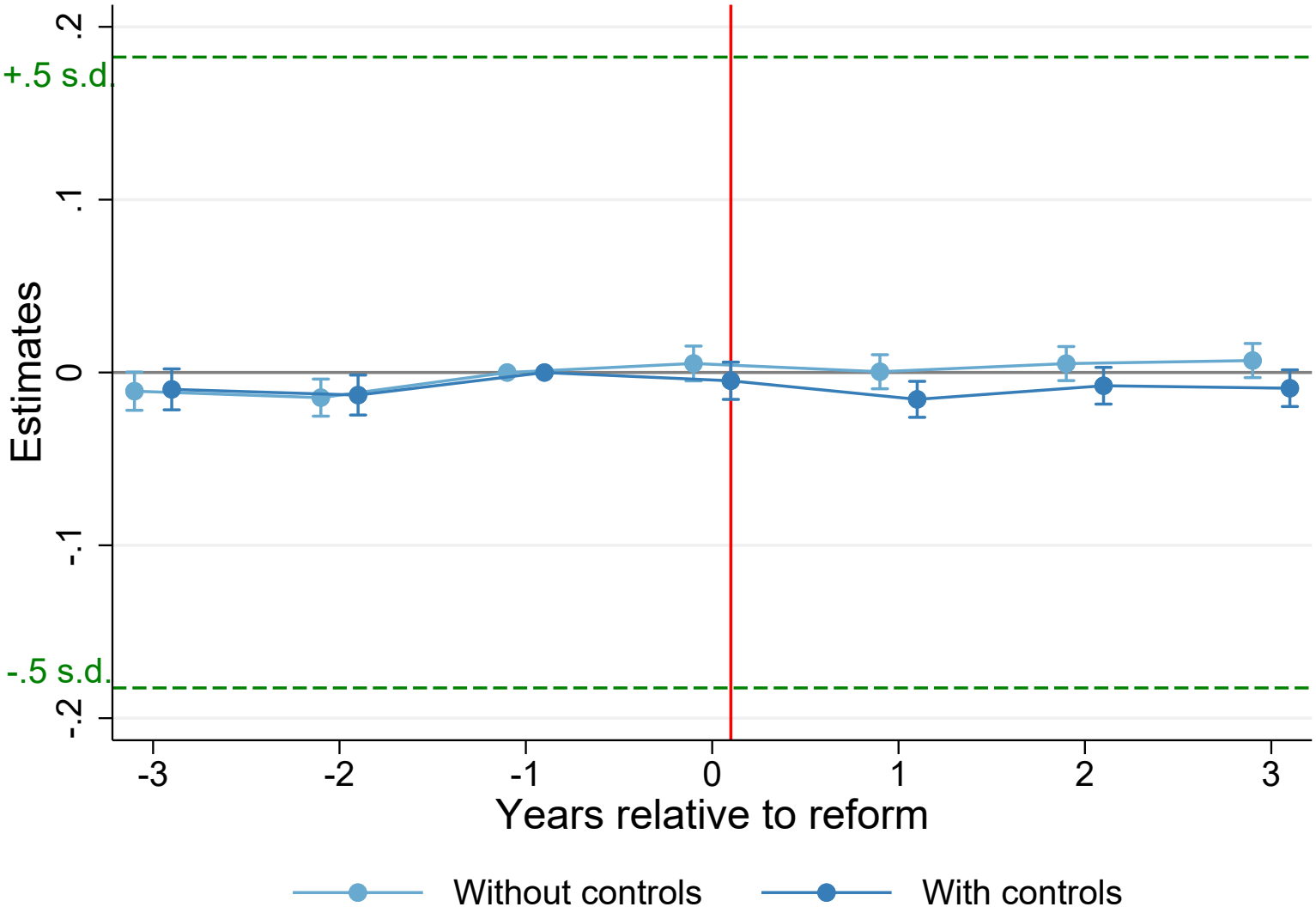
Source : Bach, et al. (2024).

Figure 51 – 2018 Reform, DiD estimates (Dividends>0) – SAS firms



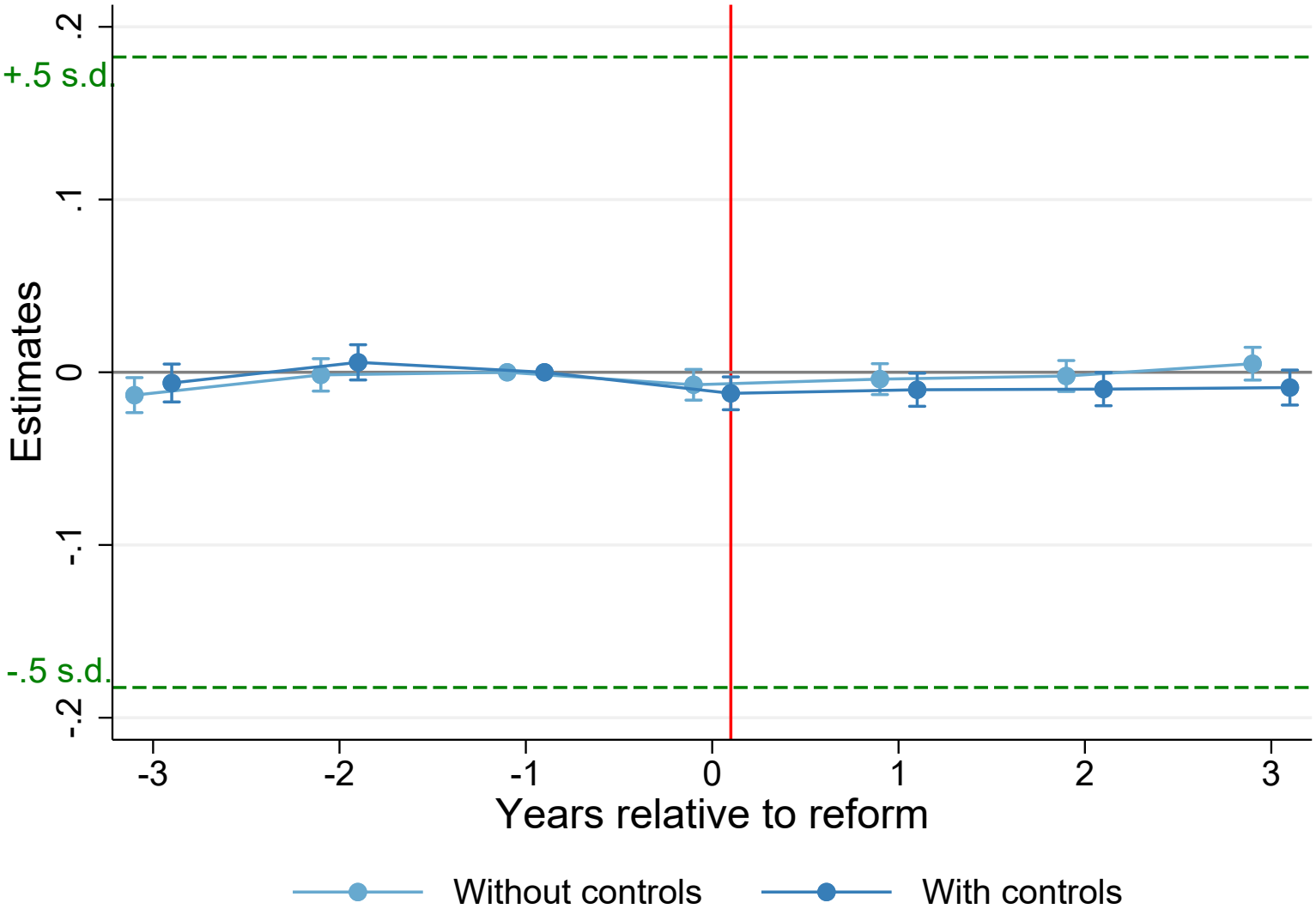
Source : Bach, et al. (2024).

Figure 52 – 2013 Reform, DiD estimates (Investment) – SAS firms



Source : Bach, et al. (2024).

Figure 53 – 2018 Reform, DiD estimates (Investment) – SAS firms



Source : Bach, et al. (2024).

Bach, Bozio, Guillouzouic, Leroy and Malgouyres (2024)

- **Results**
  - Our results confirm high dividend responses w/ little effects on investment
  - Very large tax elasticity of dividends
  - Driven by owner-managers
- **Take-away**
  - Intertemporal shifting using dividends and retained earnings
  - Firms play a role of tax shelter
  - No impact on investment because no impact on user cost of capital

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Appendix : Harberger model

- Full employment condition

$$c_{LX}X + c_{LY}Y = L_0 \tag{1}$$

$$c_{KX}X + c_{KY}Y = K_0 \tag{2}$$

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$$c_{LX}X + c_{LY}Y = L_0 \tag{1}$$

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$$p_X = c_X(r, w) \tag{3}$$

$$p_Y = c_Y(r, w) \tag{4}$$

Appendix : Harberger model

- Full employment condition

$$c_{LX}X + c_{LY}Y = L_0 \tag{1}$$

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$$p_Y = c_Y(r, w) \tag{4}$$

- Demand functions

$$X = X(p_X, p_Y, M) \tag{5}$$

$$Y = Y(p_X, p_Y, M) \tag{6}$$

Appendix : Harberger model

- Full employment condition

$$c_{LX}X + c_{LY}Y = L_0 \tag{1}$$

$$c_{KX}X + c_{KY}Y = K_0 \tag{2}$$

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$$Y = Y(p_X, p_Y, M) \tag{6}$$

- 6 unknowns, 6 equations

Closed economy : Harberger model

1. Changes in demand relates to changes in price ratio

$$\hat{X} - \hat{Y} = -\sigma_D(\hat{p}_X - \hat{p}_Y) \tag{7}$$

- σ_D is the aggregate elasticity of substitution in demands

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2. Changes in relative product prices to changes in factor prices

$$\hat{p}_X - \hat{p}_Y = \theta^*(\hat{w} - \hat{r}) \tag{8}$$

   - θ_{LX} is the share of labour in sector X
   - $\theta^* = \theta_{LX} - \theta_{LY}$ is a measure of factor intensity in terms of factor shares

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   - If X is labour intensive ($\theta^* > 0$) then a rise in the relative factor prices ($\frac{w}{r}$) causes a rise in its relative price ($\frac{p_X}{p_Y}$)

Closed economy : Harberger model

3. Changes in quantities to changes in relative factor prices

$$\lambda^*(\hat{X} - \hat{Y}) = (\hat{w} - \hat{r})(\alpha_X \sigma_X + \alpha_Y \sigma_Y) \tag{9}$$

- σ_X is the elasticity of substitution in sector X
- λ_{LX} is the share of labour force L_0 in sector X
- $\lambda^* = \lambda_{LX} - \lambda_{KX}$ is a measure of factor intensity in terms of physical inputs

Closed economy : Harberger model

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$$\lambda^*(\hat{X} - \hat{Y}) = (\hat{w} - \hat{r})(\alpha_X \sigma_X + \alpha_Y \sigma_Y) \tag{9}$$

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- λ_{LX} is the share of labour force L_0 in sector X
- $\lambda^* = \lambda_{LX} - \lambda_{KX}$ is a measure of factor intensity in terms of physical inputs
- If X is labour intensive ($\lambda^* > 0$) then a rise in output of X relative to Y is associated with a rise in the wage relative to the rate of profit

back