Corporate Tax Breaks and Executive Compensation

Eric Ohrn
Grinnell College

University of Munich
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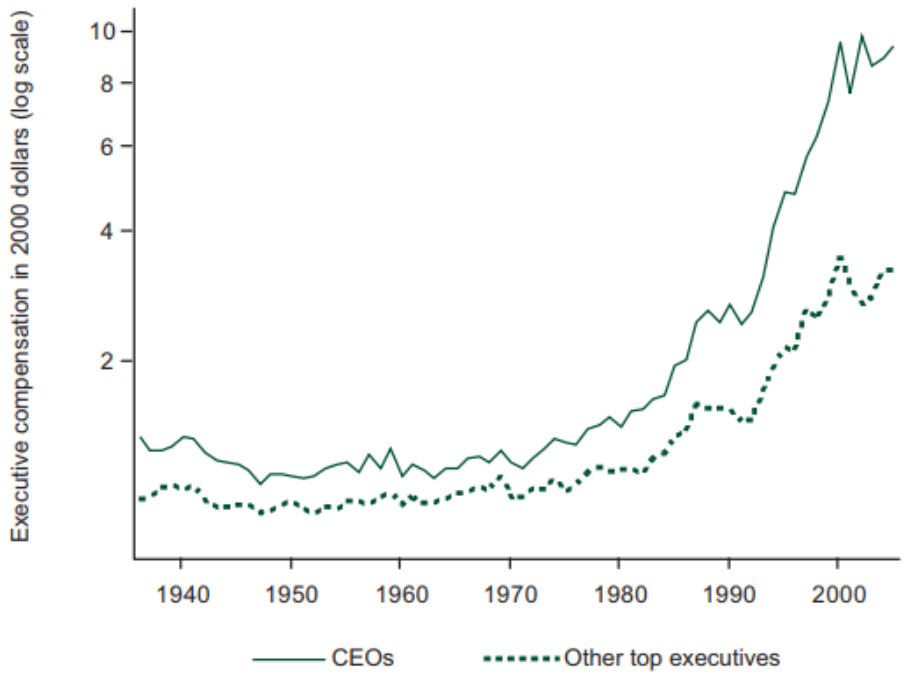
Motivation

- Over the past 30 years, there has been a substantial rise in CEO and executive compensation around the world.
- The rise has been particularly spectacular at publicly traded US firms.

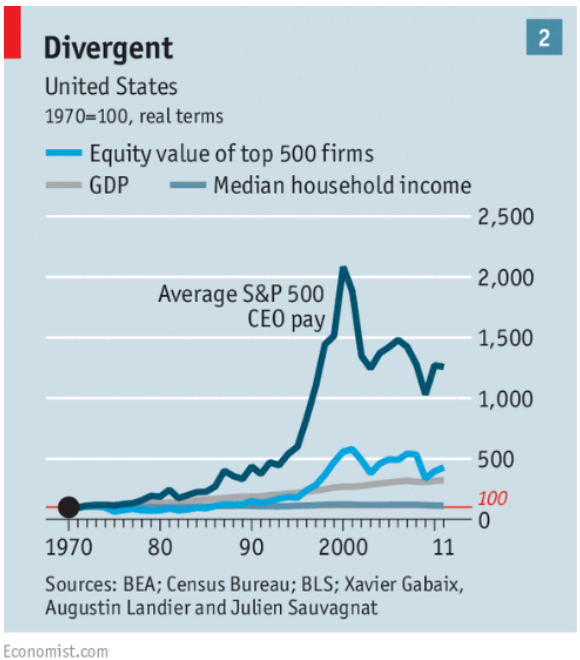
  From Frydman and Jenter (2010):

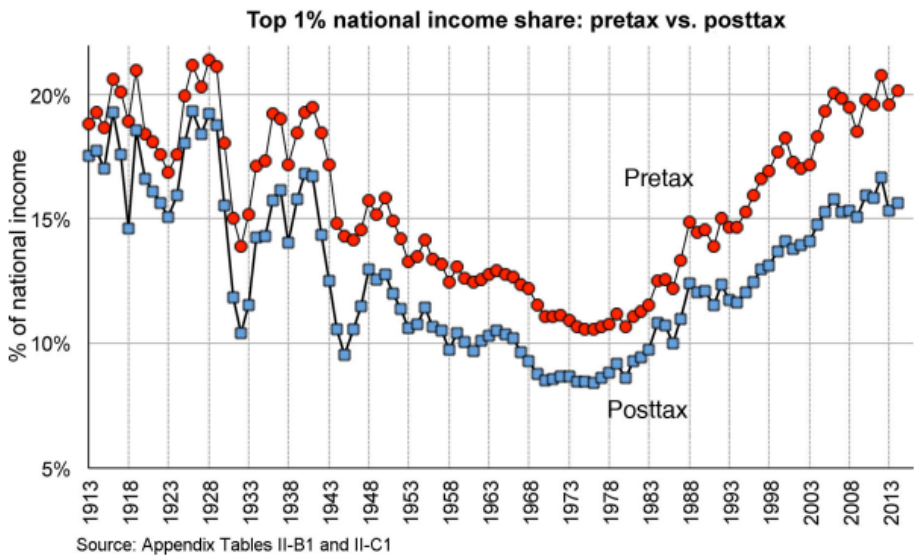


- 1980–2010: 9x increase in CEO pay, 5x increase in pay for other top executives

Motivation

- This rise in CEO and executive compensation has been disproportionate relative to wages, GDP, and firm value.
- The disconnect suggests a connection to the well-documented increase in US income inequality (Piketty, Saez and Zucman (2017), Smith, Zidar, Zwick et al. (2020)).

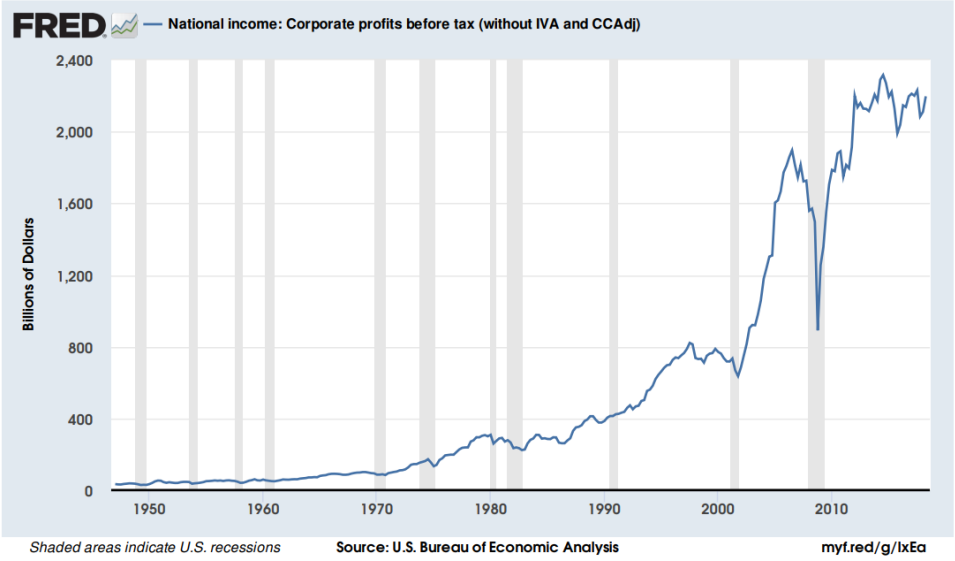




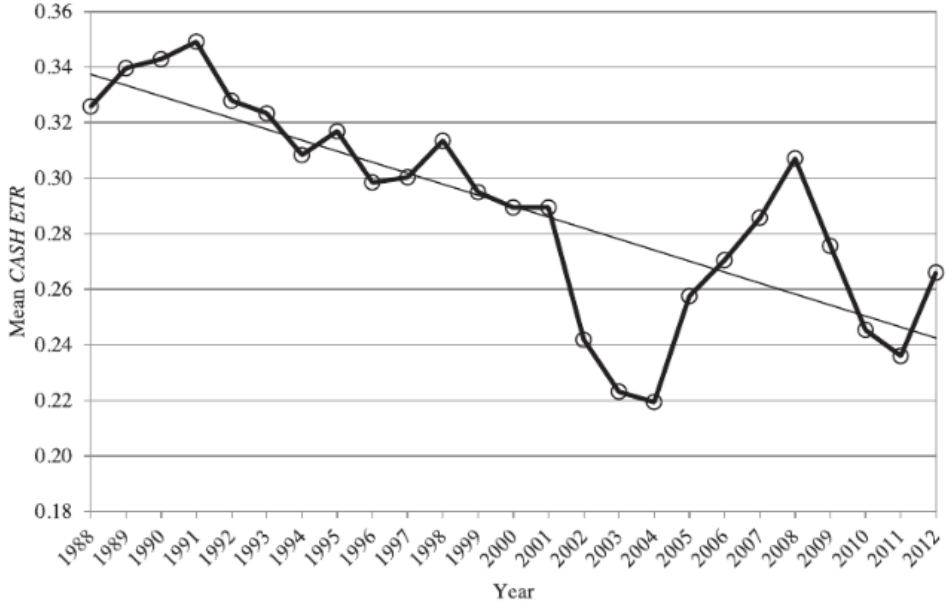
Motivation

Meanwhile...

- In the presence of increasing pretax corporate profits in the US (FRED),



- Effective corporate tax rates have significantly decreased (Dyreng, Hanlon, Maydew and Thornock (2017)).



Introduction

These trends motivate **an obvious and important, but unaddressed question:**

Do corporate tax breaks affect executive compensation?

... and perhaps income inequality?

Corporate tax breaks mechanically increase after-tax revenues / cash flows.

After-tax revenues can be used to increase executive compensation via either

- an efficient market for managerial talent
- or rent capture by executives.

Especially important for policy makers who, ostensibly, design corporate tax breaks to induce a desired behavior (i.e. capital investment, green energies, hiring)

... rather than to pad the pockets of executives.

Answers to this question are also timely as the **Tax Cuts and Jobs Act of 2017** has accelerated the decreasing effective corporate tax rate trend in the US and increased tax rate competition worldwide.

Introduction

In **this study**, I address these questions using

- quasi-experimental variation in two recent US federal corporate tax expenditures
  - ("breaks")
- modified difference-in-differences framework

to measure the effect of corporate taxation on the compensation packages of executives at large, publicly traded corporations.

Headline Findings: Corporate tax breaks increase executive compensation

1. a one percentage point decrease in the present value cost of new investments due to **bonus depreciation** increases executive compensation by 4.4%
2. a one percentage point reduction in effective corporate income tax rates due to the **Domestic Production Activities Deduction** (DPAD) increases pay by 3.3%

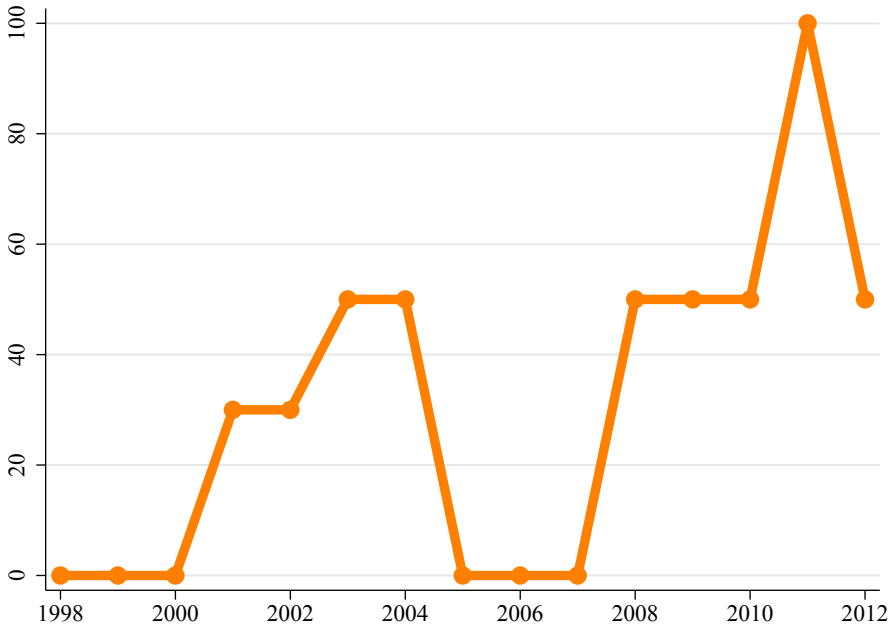
These estimates imply that at a large publicly traded firms, **every dollar of cash flows generated by the tax breaks increases the compensation of the firm's five highest paid executives by 16 to 18 cents.**

The Tax Breaks

Bonus Depreciation

- Typically, MACRS defines the allowable deductions generated by a new capital expenditure in each year
- Bonus depreciation allows a "bonus" percentage of investment costs to be deducted from taxable income in the first year
- Decreases the present value cost of investment by giving firms cash now as opposed to later
- Longer-lived assets benefit most from the policy→ industries that invest in longer-lived assets, on average, benefit more from the policy
- Zwick and Mahon (2017): 50% bonus → 2.73% decreases in PV cost of investments

Figure: Bonus Depreciation (%) over time



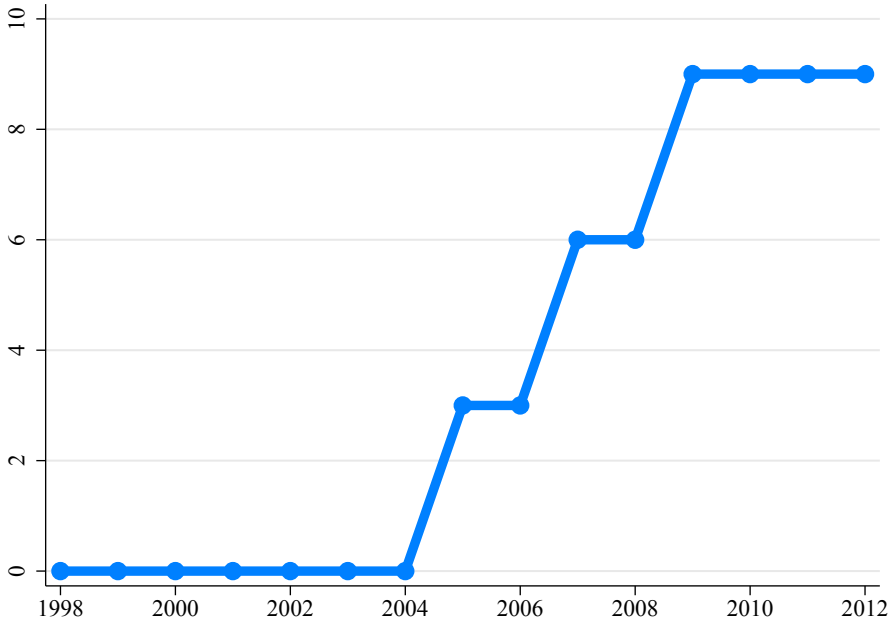
Notes: This figure shows statutory bonus depreciation rates during the years 1998–2012.

Bonus Example

DPAD

- DPAD allows firms to deduct a percentage of income derived from domestic manufacturing activities from their taxable income
- Percentage increased from 3 to 6 to 9% during the years 2005–2009
- At maximum 9% rate, DPAD decreases the effective corporate income tax rate by 3.15 percentage points for a 100% domestic manufacturing firm
- Benefit is larger for firms that derive a higher percentage of income from manufacturing activities
- Ohrn (2018): on average, 9% DPAD → 1.43 percentage point reduction on effective CIT rate

Figure: DPAD Rate (%) over time



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Tax Breaks Legislation

Bonus Depreciation

- From 2002–2012, bonus depreciation was part of 8 different pieces of legislation
- Enacted in piece-meal, usually one year extenders, sometimes retroactive
- Always some uncertainty regarding continuation
- Firms can benefit even when in tax loss positions $\rightarrow$ increases NOLs

DPAD

- Replaced a different policy, the ETI
- Enacted as part of AJCA 2004 with the proposed phase-in schedule that was followed in subsequent years
- Predictable increases in the DPAD deduction rate, more believable after 2005, 2007
- Limited by taxable income so no benefit to loss making firms

Estimation Strategy and Data

Measuring the Tax Breaks

Bonus Depreciation

I follow Zwick and Mahon (2017) and combine

- an industry-level measure of the average depreciation life of new capital assets (from administrative tax data) and
- changes in the generosity of bonus depreciation over time to create

BONUS = percentage point decrease in the PV price of new investment

DPAD

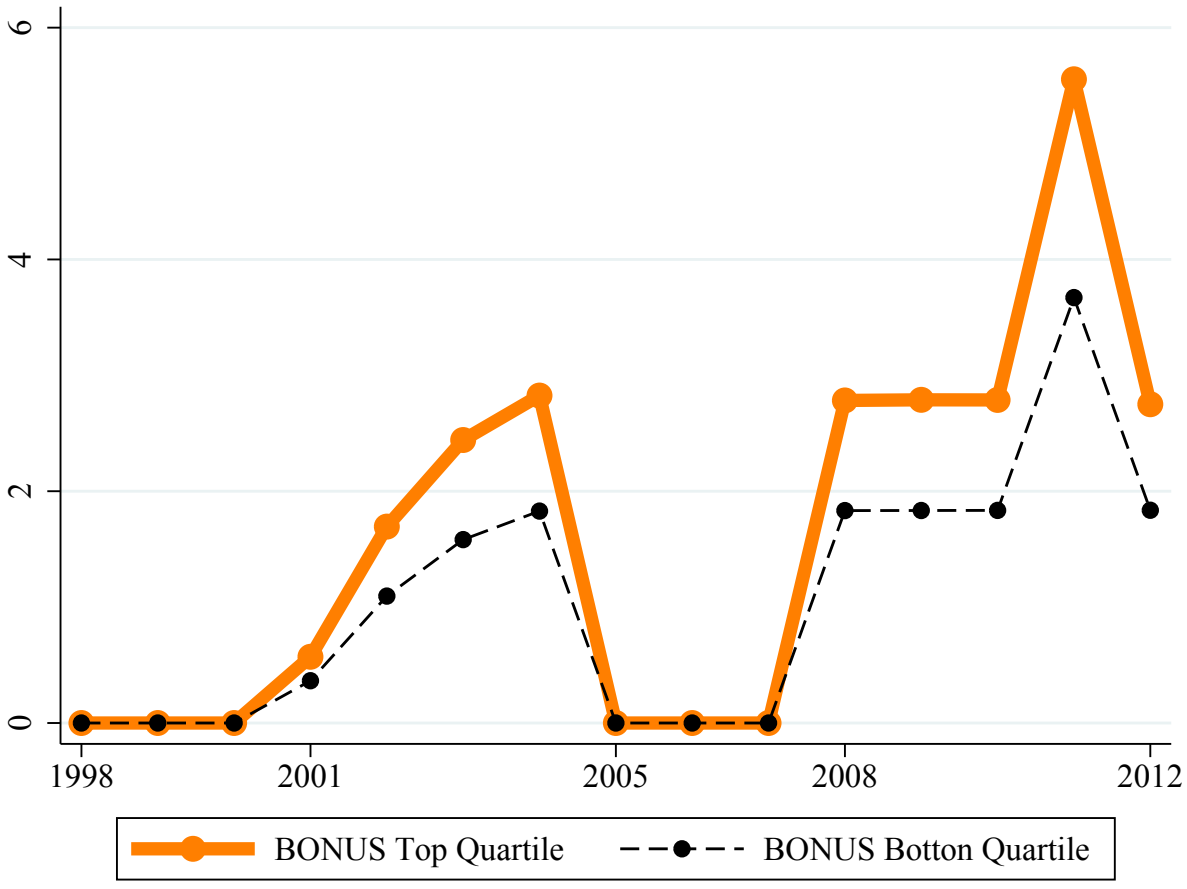
I follow Ohrn (2018) and combine

- Industry-by-size percentage of income that qualifies for the deduction from IRS SOI
- firm-level taxable status (taxable income >0)
- variation in the generosity of the DPAD over time to create

DPAD = percentage point reduction in effective CIT due to the DPAD

Bonus Depreciation

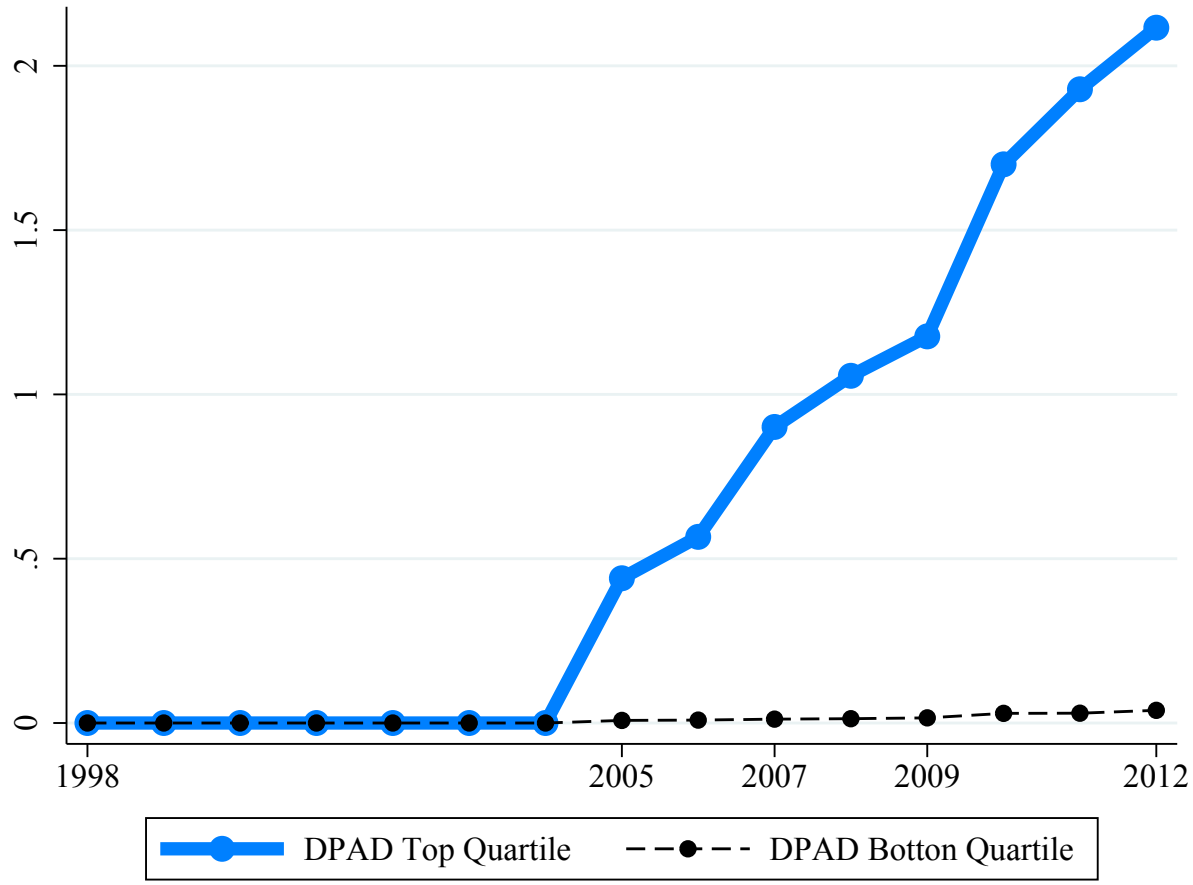
Figure: Quasi-experimental Variation in Bonus Depreciation (%) over time



Notes: This figure displays the percentage point reduction in capital investment costs due to bonus depreciation for the quartile of firms with the longest tax lives relative to firms with the shortest tax lives during the years 1998–2012.

DPAD

Figure: Quasi-experimental Variation in the DPAD (%) over time



Notes: This figure displays the percentage point reduction in the effective corporate income tax rate due to the DPAD for firms in the top quartile of DPAD relative to firms in the bottom quartile of DPAD during the years 1998–2012.

Data Sources

Executive Compensation Data

- Executive compensation data is taken from the Compustat Execucomp database
- Sample is limited to the top five highest paid executives at each firm in each year
- Execucomp includes gender, some data on executive positions, and can be used to construct an experience variable (number of years in Execucomp)

Other Data Sources

- Firm financial statement data from COMPUSTAT in order to control for firm-level determinants of executive pay
- 13f Institutional Holdings data from Reuters to construct the percentage of shares held by the largest institutional investor
- Governance score based on Risk Metrics data following Bebchuk, Cohen and Ferrell (2009)

Final Data Sample

- 15 years; 1998–2012
  - 4 years before bonus depreciation enacted, 4 years after DPAD fully-phased in
- 29,865 executives
- 2,798 firms

Descriptive Statistics

Estimation Strategy

Modified **difference-in-differences** empirical strategy:

$$\text{Ln(Total Comp)}_{i,t} = \beta_0 + \beta_1[\textbf{BONUS}_{j,t-1}] + \beta_2[\textbf{DPAD}_{i,t-1}] + \gamma\mathbf{X}_{i,f,t-1} + \nu_t + \mu_f + \varepsilon_{i,t}$$

- **Ln(Total Comp)**: natural log of total compensation awarded to five highest paid at Execucomp firms
- $\mathbf{X}$: controls which vary by specification and can include other tax policies (ETI), executive experience and gender, firm size, ROA, and R&D, and 2001 or 2004 terciles of firm size, ROA, market-to-book, and pre-period compensation growth interacted with year indicators
- $\nu_t + \mu_f$: year and firm fixed effects
- I follow the executive compensation literature in lagging tax policies and firm controls
- Standard errors are clustered at the industry-level (Bertrand, Duflo and Mullainathan (2004), Cameron and Miller (2015))
- I will perform a series of dynamic analyses in which I will replace the temporal variation each policy's generosity with a series of year indicators to measure how differences between the most and least treated units evolve over time

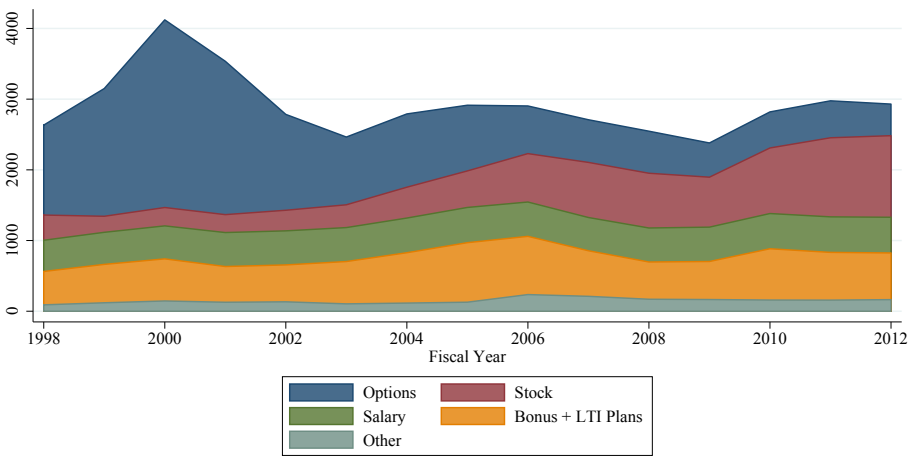
Outcome Variable

Total Compensation Awarded

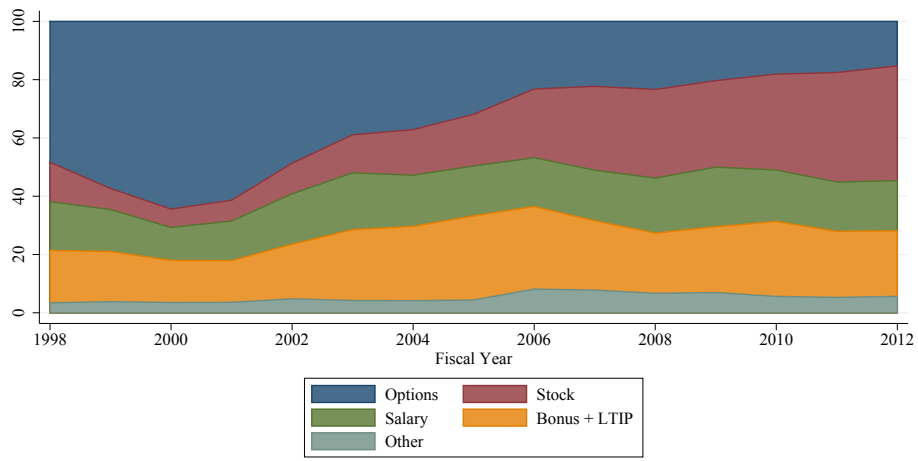
- comprised of an executives salary, bonus, other annual (non-incentive) compensation, total value of restricted stock granted, total value of stock options granted (calculated using the Black Scholes formula), long-term incentive payouts, and all other compensation
- "awarded": options valued at granting date price

Figure: Structure of Executive Compensation for Analysis Sample

Compensation Levels ($1,000s) by Category



Percent of Total Comp by Category



Notes: The left panel of this figure shows the

- average Total Comp fairly stable over the period
- increasing use of restricted stock relative to options after 2000

Baseline Results

Baseline Estimates

Table: Effect of Tax Breaks on Executive Compensation; Baseline Analysis

	(1) Ln(Comp)	(2) Ln(Comp)	(3) Ln(Comp)	(4) Ln(Comp)	(5) Ln(Comp)
Lagged BONUS	0.0300**	0.0301**	0.0381***	0.0443***	0.0435***
	(0.0122)	(0.0123)	(0.0127)	(0.0117)	(0.0114)
Lagged DPAD	0.0387***	0.0390***	0.0390***	0.0333***	0.0324***
	(0.0127)	(0.0117)	(0.0116)	(0.0127)	(0.0123)
Year FE	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓
Tax Controls		✓	✓	✓	✓
Exec Controls			✓	✓	✓
Fize Size Control				✓	✓
ROA, RD Controls					✓
Observations	127256	127256	127256	127256	127256

Notes: This table presents coefficient estimates of the effect of Lagged BONUS and Lagged DPAD on executive compensation. The outcome variable in all specifications is the log of Total Comp Awarded. All specifications include firm and year fixed effects. Specifications (2)–(5) control for the ETI. Specifications (3)–(5) include executive controls for gender and experience. Specifications (4) and (5) include time-varying firm-level controls for lagged log assets. Specification (5) includes time-varying firm-level controls for lagged ROA and lagged R&D expenditure dividend by sales. Standard errors are presented in parentheses and are clustered at the four-digit NAICS level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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Internal Validity Checks

Identification Strategy Scrutiny

Key Threat to Identification:

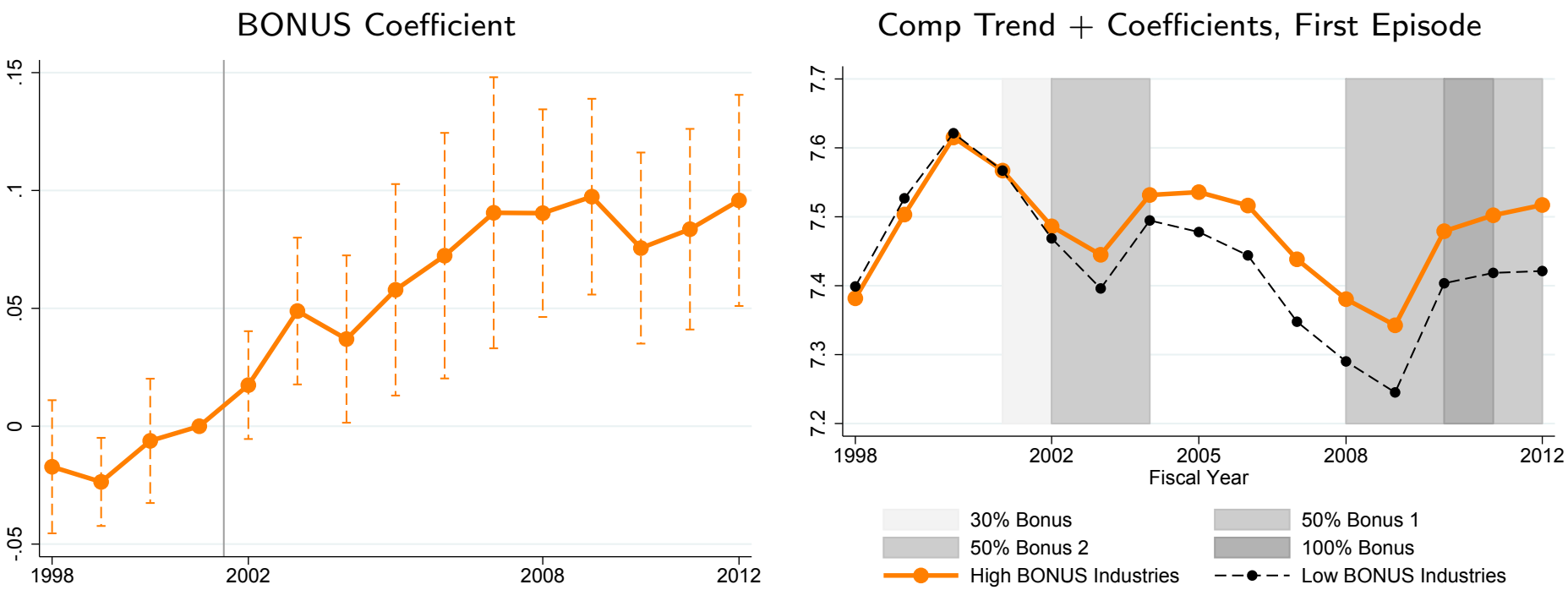
Other industry-by-time shocks affecting executive compensation covary with the policies.

I address this threat by

1. examining dynamic effects of the policies
2. showing results are robust to a number of modeling specifications designed to address key threats
3. performing two placebo tests; one for each policy
   - DPAD Placebo: QPAI% $\times$ Non-taxable
   - BONUS Placebo: Long-duration industries that invest in 5$\times$ more ineligble as eligible capital

Dynamic Difference-in-Differences

Figure: Effect of **Bonus Depreciation** on Executive Compensation



Notes: This figure presents a graphical dynamic analysis of the effect of bonus depreciation on executive compensation. $\beta_{1998} - \beta_{2012}$ with β_{2001} normalized to 0. Vertical bands represent 95% confidence intervals. Panel (b) presents the trend in the Log of Total Comp Awarded and the trend plus the coefficients. These lines represent trends in average executive compensation for Low BONUS (the trend) and High BONUS (the trend plus coefficients) industries.

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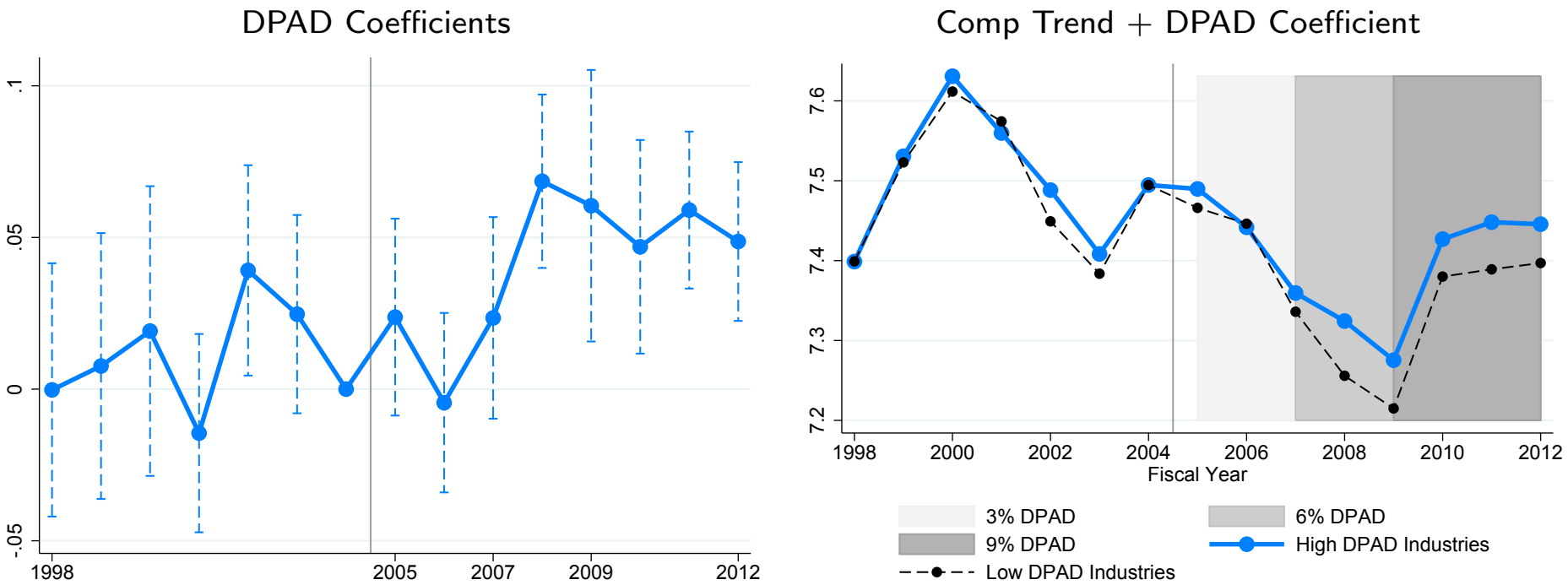

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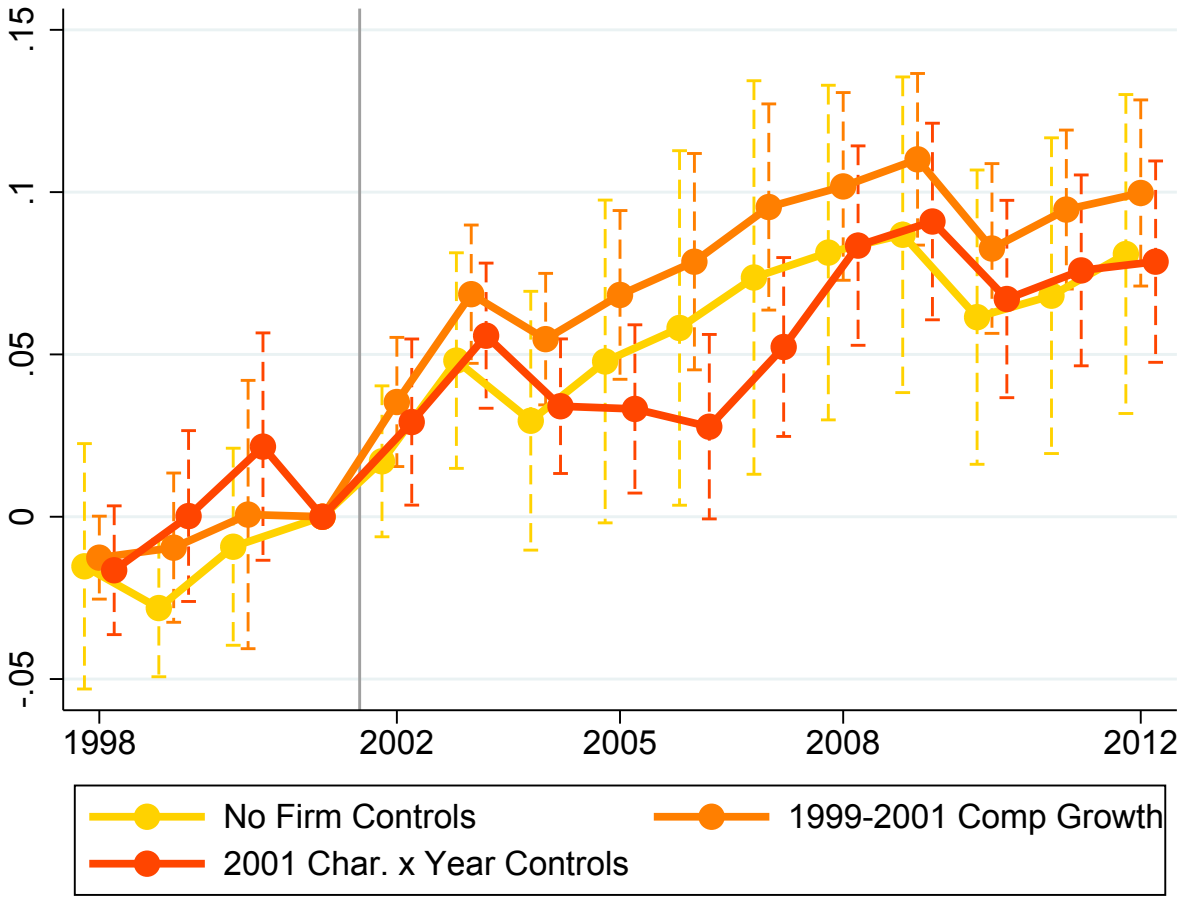

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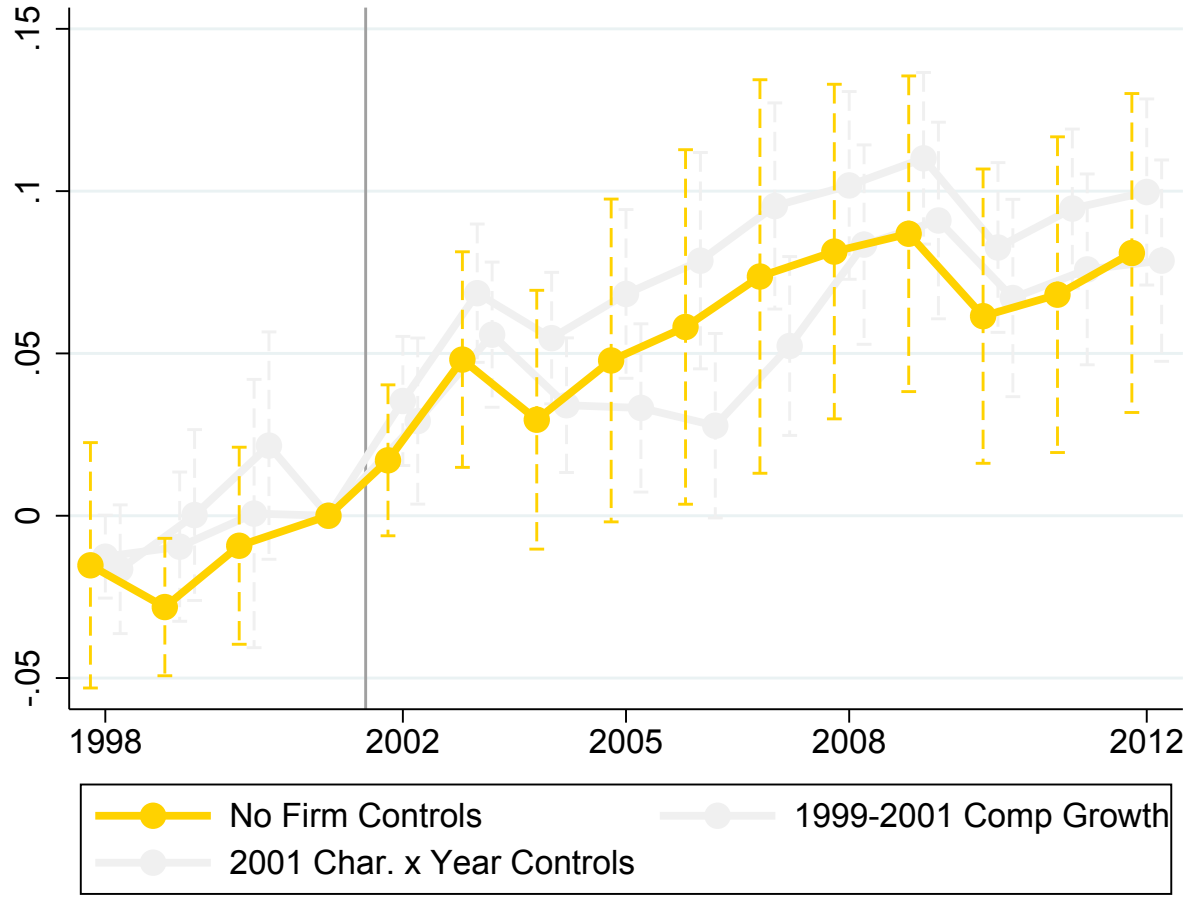

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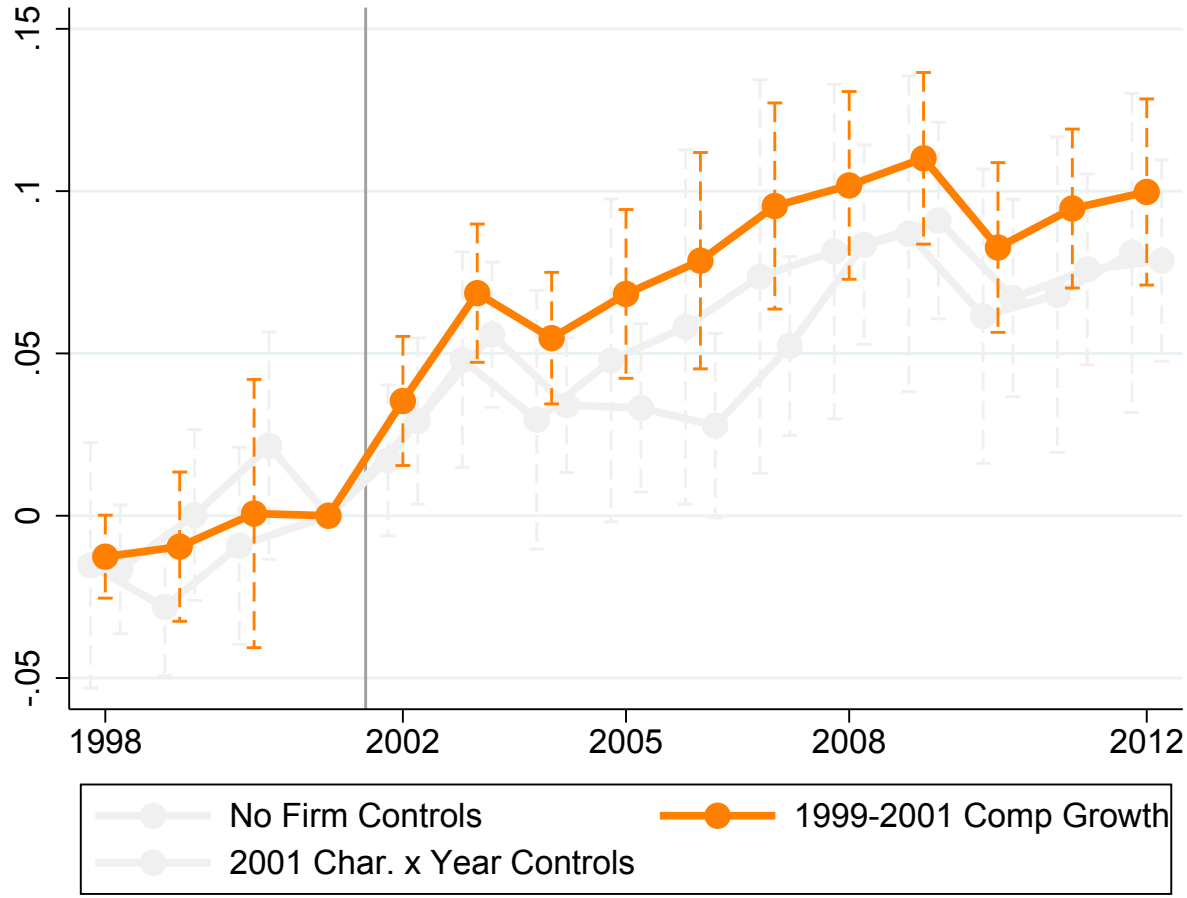

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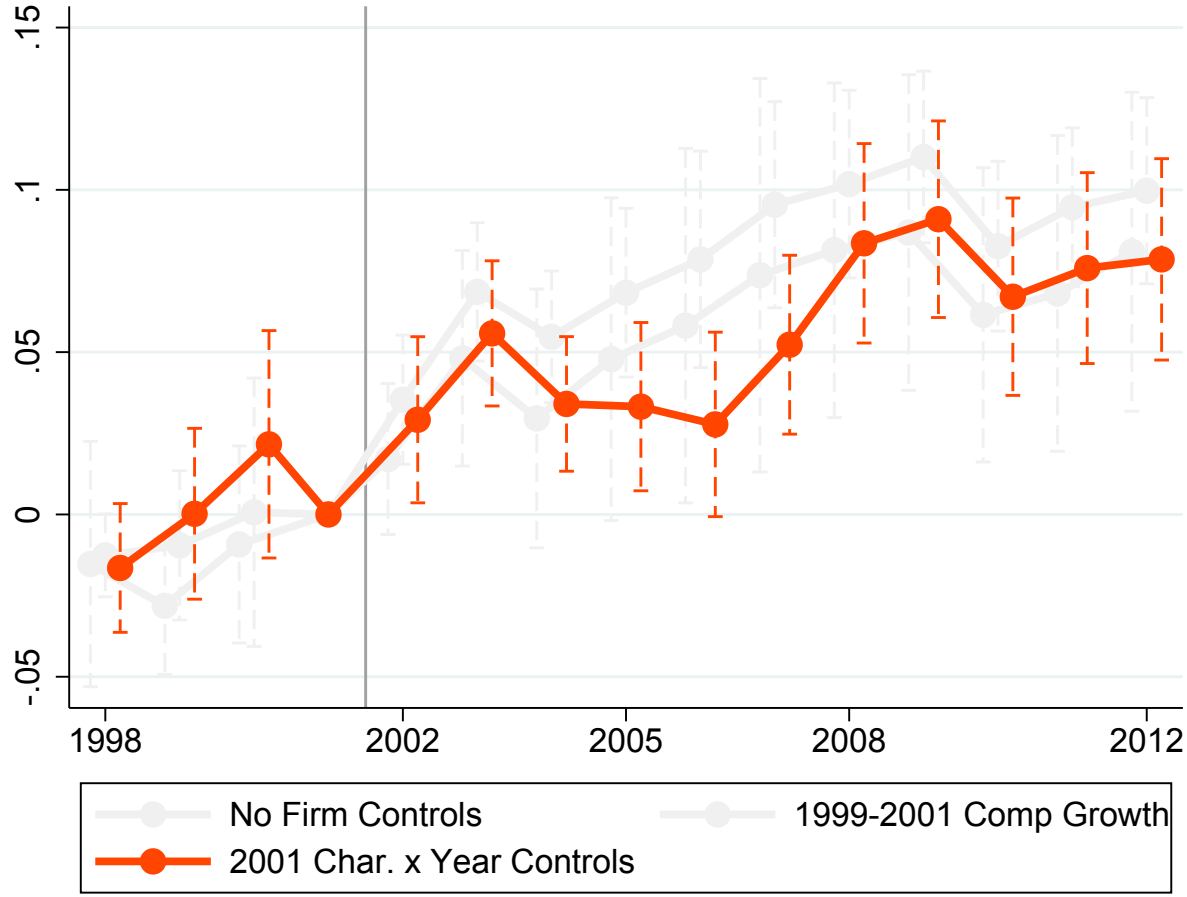

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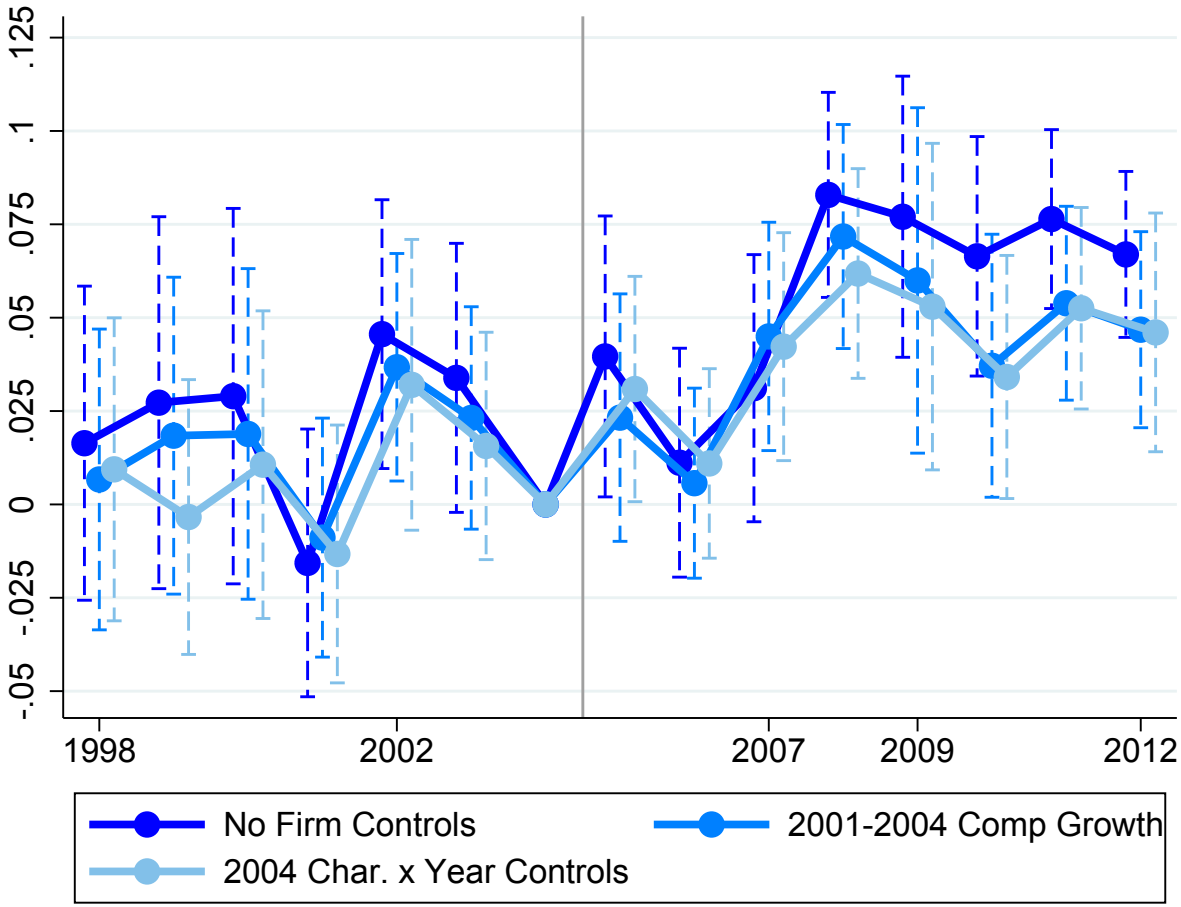

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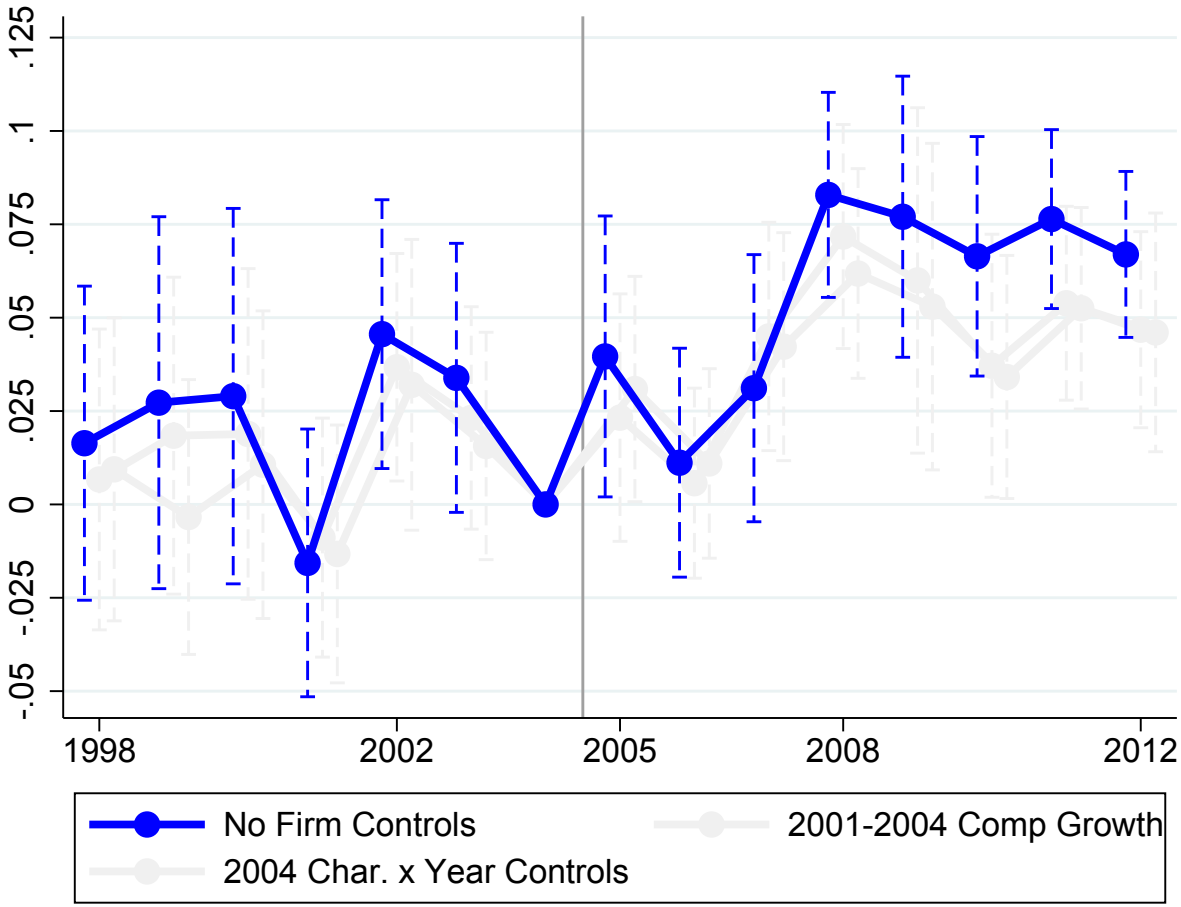

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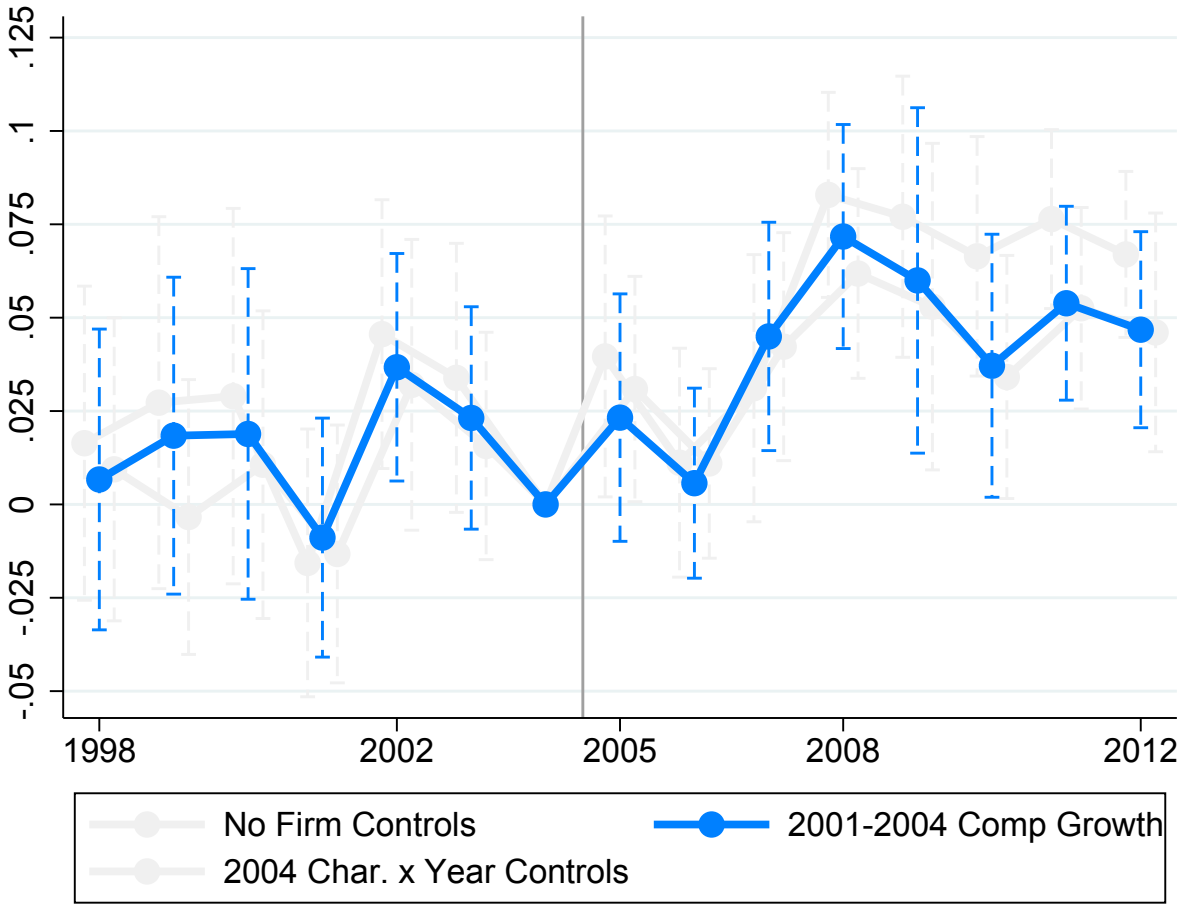

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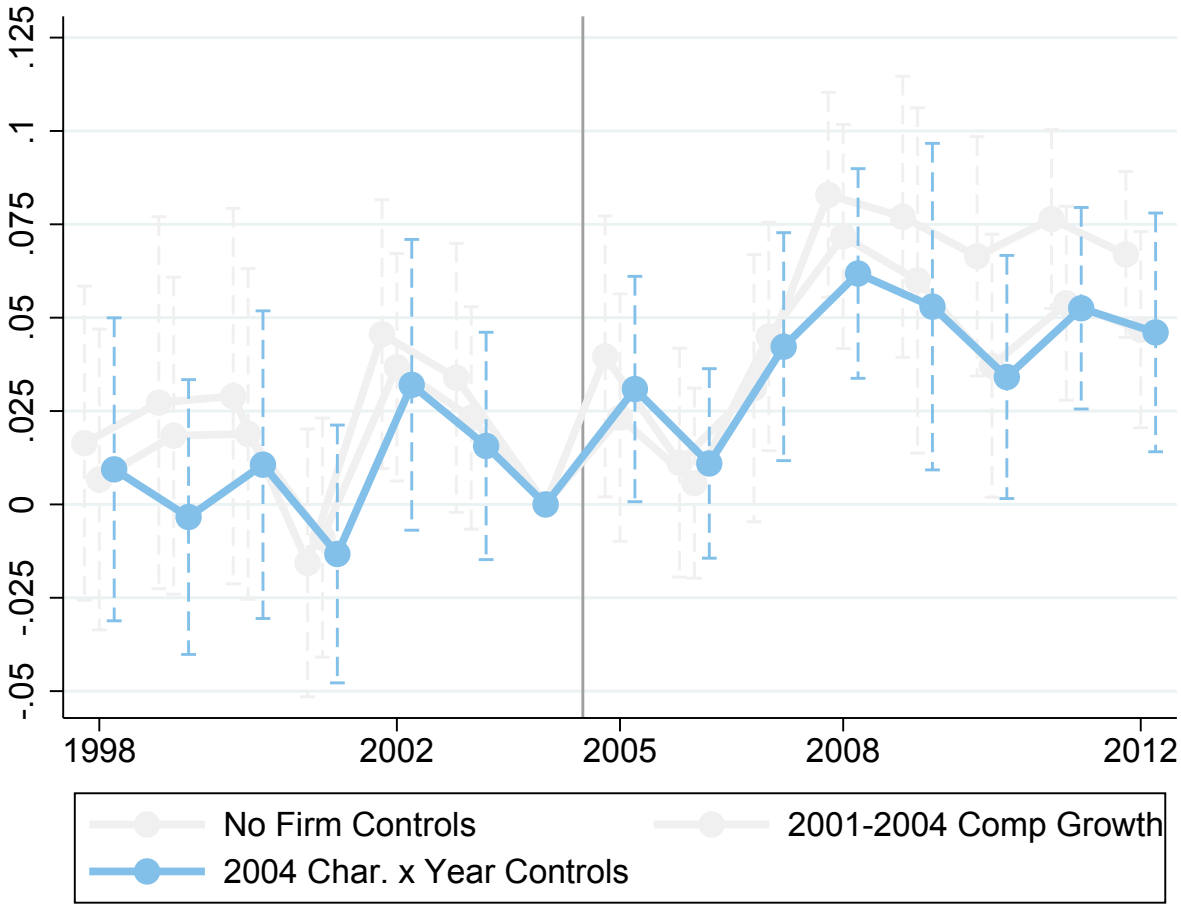

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Robustness of Baseline Estimates to Alternative Specifications

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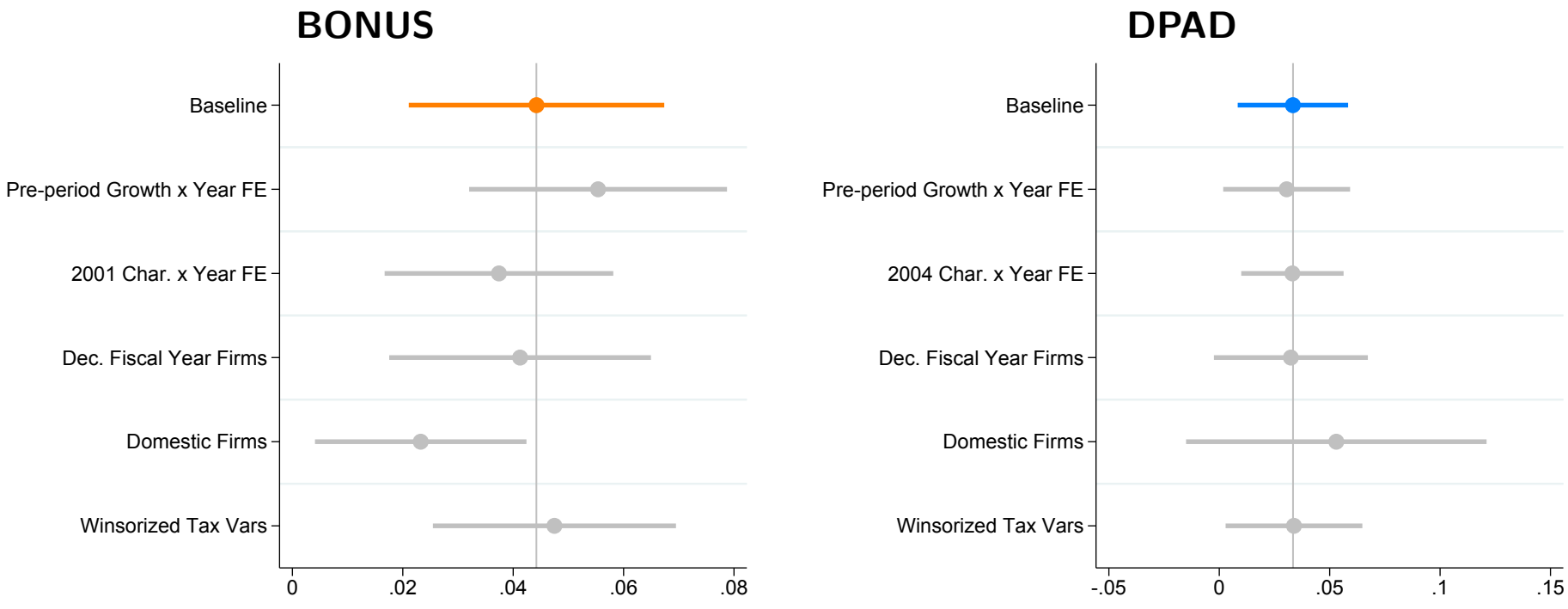

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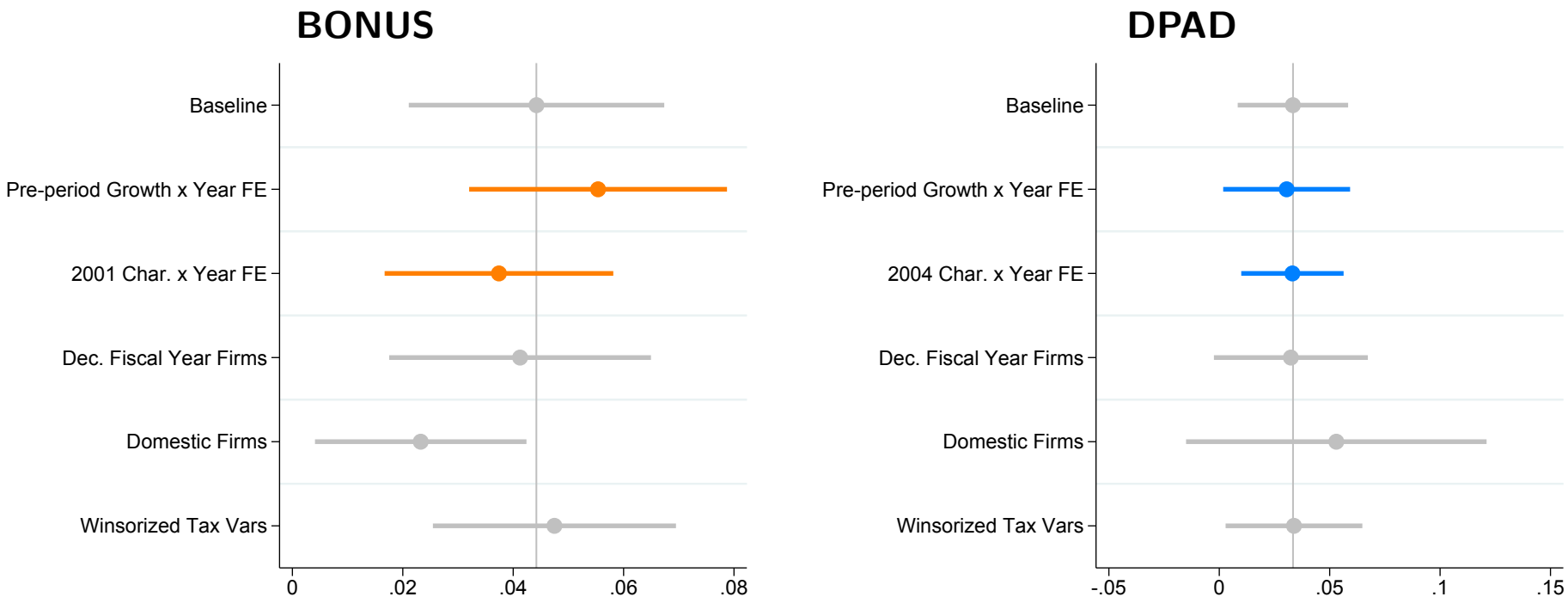

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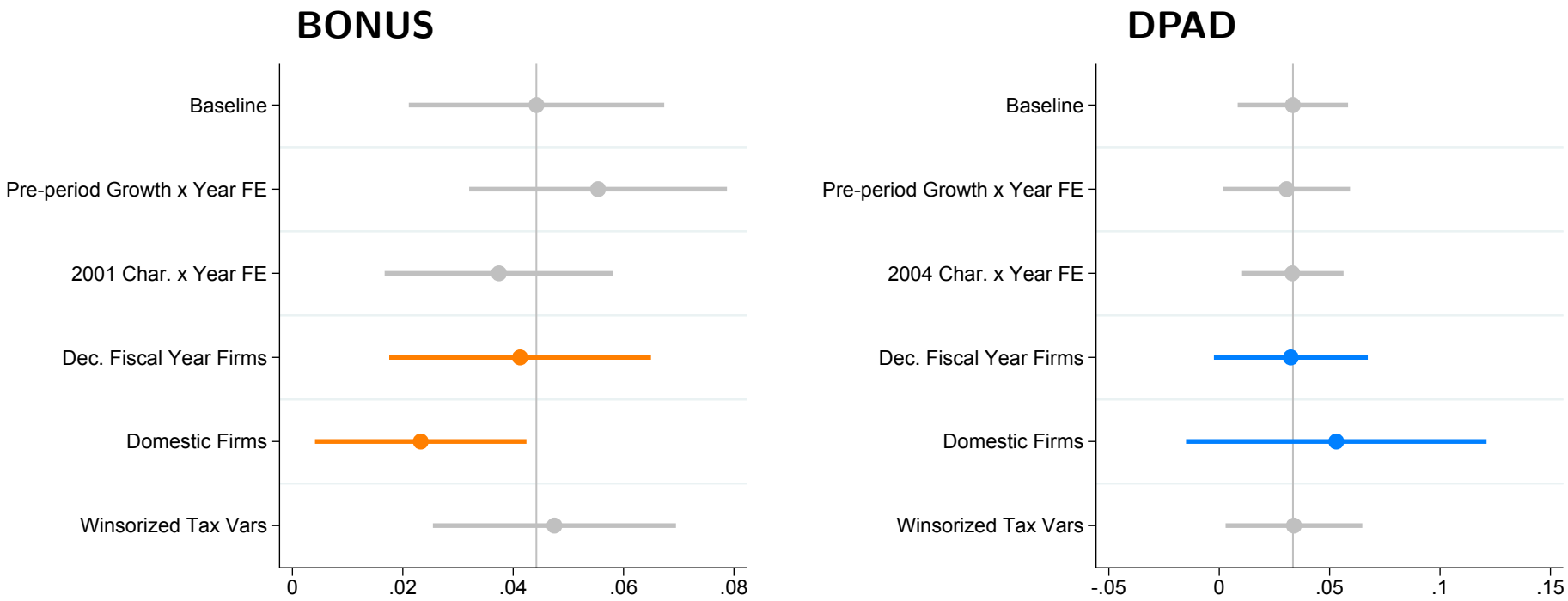

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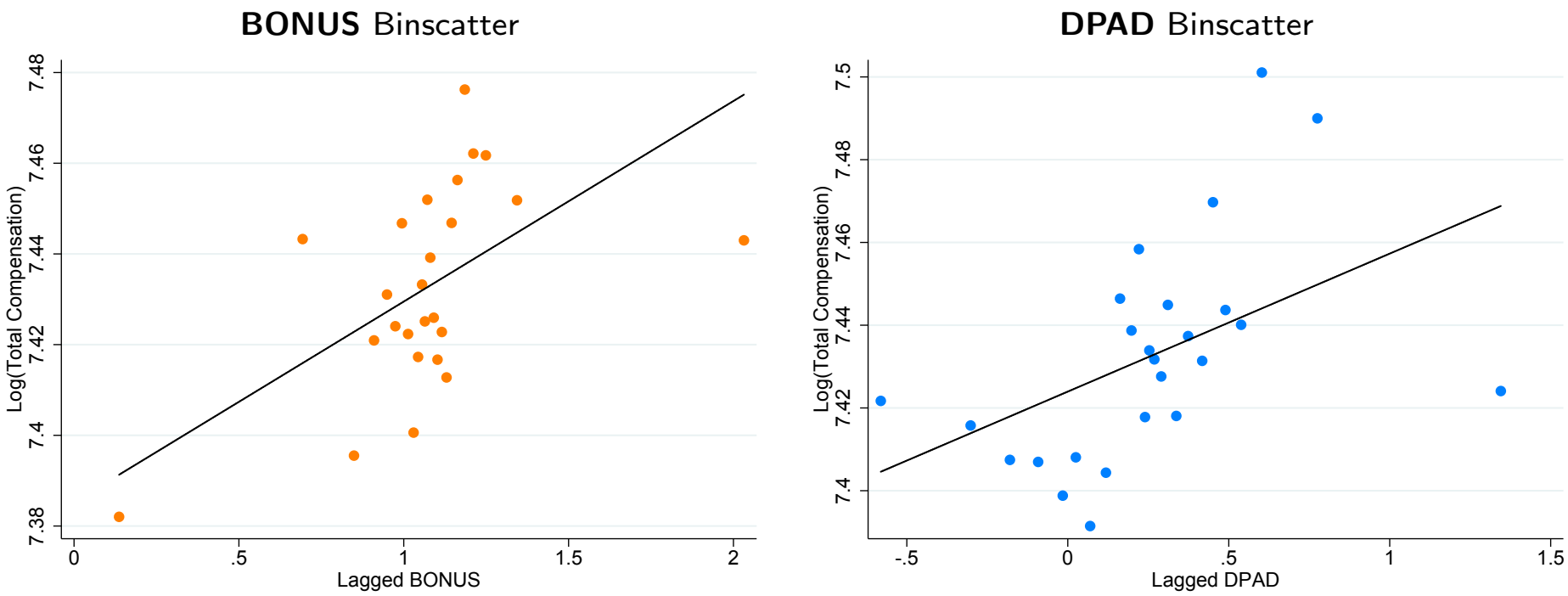
Binscatter

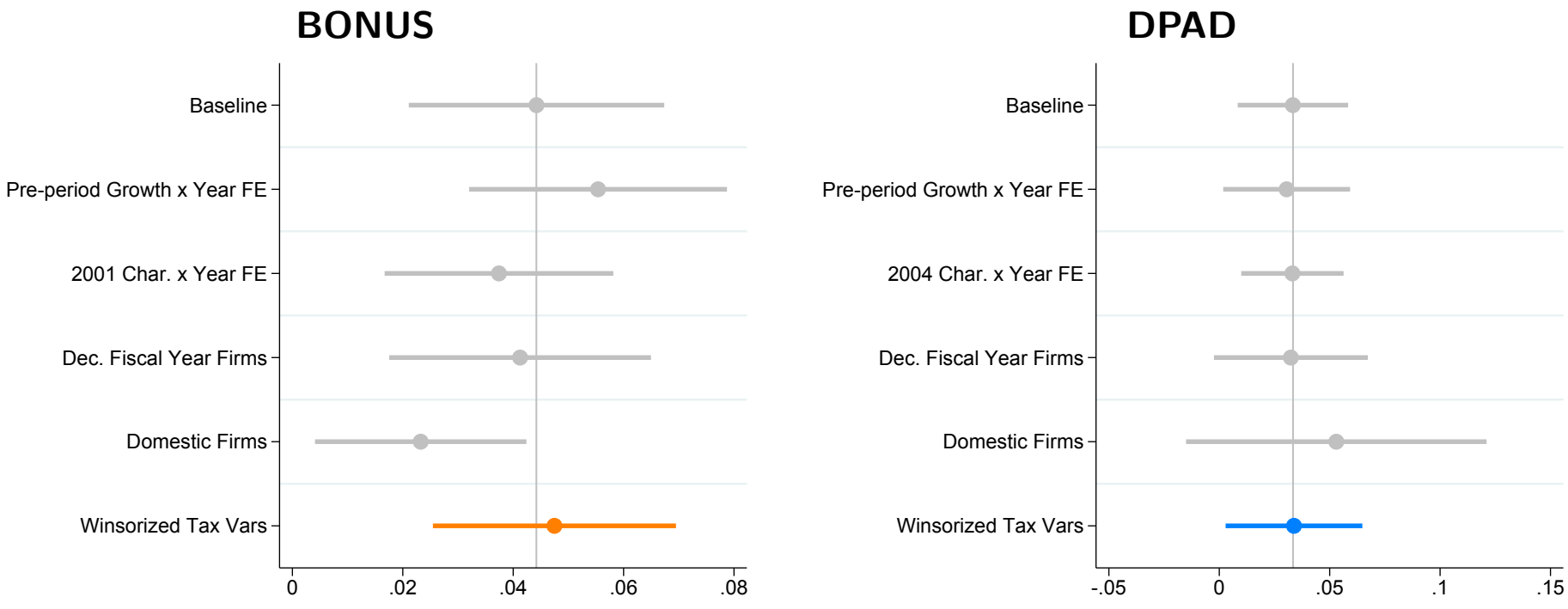
Figure: Binscatter Plots, Effects of Tax Breaks on Executive Compensation



Notes: This figure presents binscatter plots showing the effect of each tax break on Log(Total Comp). Black lines are linear projections based on the underlying data. Binscatter plots are conditional means of the outcome on bins of the tax breaks after conditioning on all controls. Both models include the other tax break, firm and year fixed effects, controls for executive gender and experience and lagged log of firm size.

Robustness of Baseline Estimates to Alternative Specifications

Figure: Robustness to Alternative Specifications



Notes: Panels (A) and (B) show the robustness of of the baseline estimates of Lagged BONUS and Lagged DPAD to alternative specifications. The first row displays baseline estimates. The second row includes terciles of Log(Total Comp) growth during the preperiod interacted with year fixed effects. The third row includes indicators for terciles of lagged ROA, lagged log firm size, and lagged log Market-to-Book interacted with year indicators. The fourth column limits the sample to firms with no pre-tax foreign income. The fifth row includes tax breaks winsorized at the 3rd and 97th percentiles in each year.

Alt. Spec. Table

Placebo Tests

Bonus Depreciation Placebo

- identify "long-lived industries" who investment 5x more in ineligible than eligible capital
  - IP and structures
- Scale variable placebo such that these "long-lived" placebo industries receive average bonus depreciation treament

DPAD Placebo

- Interact industry-by-size variation in the DPAD with an indicator for loss-making
- Estimate the effect of loss making firms generating 100% of income via domestic manufacturing activites against loss-making firms in 0% domestic manufacturing firms

Placebo Tests

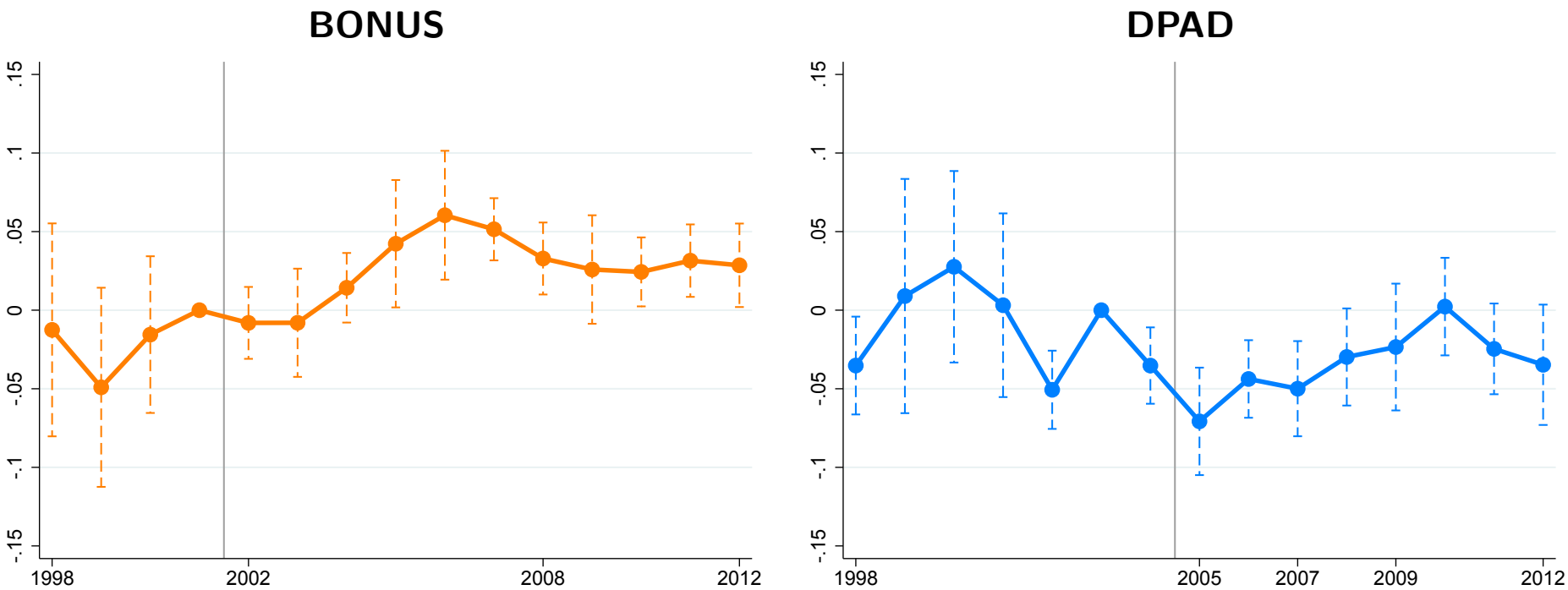
Table: Effect of Placebo Tax Breaks on Executive Compensation

	(1) Ln(Comp)	(2) Ln(Comp)	(3) Ln(Comp)
Lagged BONUS	0.0427***		
	(0.0121)		
Lagged DPAD		0.0342***	
		(0.0130)	
Lagged DPAD Placebo	-0.0268*		-0.0287*
	(0.0143)		(0.0147)
Lagged BONUS Placebo		0.0121	0.00544
		(0.0255)	(0.0260)
Year FE	✓	✓	✓
Firm FE	✓	✓	✓
Preferred Controls	✓	✓	✓
Observations	127256	127256	127256

Notes: This table presents coefficient estimates of the effect of Lagged BONUS, Lagged DPAD, and Lagged BONUS Placebo and Lagged BONUS placebo on the log of Total Comp Awarded. All specifications include firm and year fixed effects, executive controls for, gender and experience and lagged log firm size. Standard errors are presented in parentheses and are clustered at the four-digit NAICS level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Placebo Tests

Figure: Dynamic DD Placebo Tests



Bonus depreciation

- placebo test shows increases in compensation in industries that invest primarily in "long-lived" but ineligible goods do not coincide with bonus depreciation episodes
- $\rightarrow$ growth in executive compensation in "long-lived" industries per se is not responsible for estimated effects on bonus depreciation

DPAD

- placebo test show no increase in compensation for loss-making firms benefiting from DPAD
- $\rightarrow$ compensation is driven by cash flow effects of policy

Exploring Mechanisms

Exploring Mechanisms

Purely Mechanical Effects?

- Break down effects by compensation type (more or less likely to be mechanically influenced)
- Control for contemporary and lagged ROA and stock return (mechanical determinants)

More firepower in the market for executive talent?

- Estimate whether effects are larger for new hires

Rent Capture?

- Estimate whether effects are concentrated among powerful shareholders
  - CEOs, executives also on the board of directors
- Estimate whether effects are mitigated in well-governed firms
  1. firms with less "entrenched" executives (Bebchuk, Cohen and Ferrell (2009))
  2. firms with powerful principals: large institutional shareholders (Chetty and Saez (2005))

Compensation Structure

Table: Effect of Tax Breaks by and on Compensation Structure

	(1) Ln(Current)	(2) Ln(NonCurr)	(3) Current/Total	(4) Ln(Current)	(5) Ln(NonCurr)	(6) Current/Total
Lagged BONUS	0.0377***	0.0150	0.00140	0.0375***	0.0240	-0.000363
	(0.0118)	(0.0291)	(0.00642)	(0.0128)	(0.0303)	(0.00676)
Lagged DPAD	-0.00300	0.0578**	-0.0136***	-0.00535	0.0444*	-0.0118**
	(0.00975)	(0.0235)	(0.00460)	(0.00976)	(0.0243)	(0.00465)
Mech. Controls				✓	✓	✓
Observations	127256	125563	127256	122535	121008	122535

Notes: This table presents coefficient estimates from specifications similar to the preferred baseline with alternative outcomes. The outcome variable in columns (1) and (4) is the log of Total Current Compensation (salary plus bonus). The outcome variable in columns (2) and (5) is the log of Total Non-Current Compensation (total compensation awarded minus salary plus bonus). The outcome variable in columns (3) and (6) is the ratio of Total Current Compensation to Total Compensation Awarded. All specifications include firm and year fixed effects, controls for executive experience and gender, and the log of firm size. Specifications (4)–(6) also include controls for ROA, lagged ROA, stock return, and lagged stock return. Standard errors are presented in parentheses and are clustered at the four-digit naics level. * p <0.10, ** p <0.05, *** p <0.01

- Bonus affects salary and bonus comp, DPAD affects stock-based comp
- Effects consistent with legislation
  - bonus: piecemeal, cash now vs. later
  - DPAD: planned, generates future benefit
- Including Mech. Controls (ROA, Stock Return, and their lags)

  → effects are not purely mechanical

Executive Position Heterogeneity

Table: Heterogeneity in the Effect of Tax Breaks by Executive Position

	(1) Ln(Comp)	(2) Ln(Comp)	(3) Ln(Comp)	(4) Ln(Comp)
Lagged BONUS	0.0457***	0.0390***	0.0424**	0.0250*
	(0.0155)	(0.0134)	(0.0161)	(0.0128)
Lagged DPAD	0.0335*	0.0318**	0.0343**	0.0382***
	(0.0174)	(0.0128)	(0.0161)	(0.0103)
L.BONUS × New Hire	-0.00535			
	(0.00492)			
L.DPAD × New Hire	0.00109			
	(0.0172)			
L.BONUS × CEO		0.0135**		0.00820
		(0.00550)		(0.00637)
L.DPAD × CEO		0.0135		0.00594
		(0.0194)		(0.0191)
L.BONUS × Director			0.0102	0.0160*
			(0.00746)	(0.00842)
L.DPAD × Director			-0.0246*	-0.0255
			(0.0147)	(0.0154)
Observations	127256	127256	127256	127256

Governance Level Heterogeneity

Table: Heterogeneity in the Effect of Tax Breaks by Governance Level

	(1) Ln(Comp)	(2) Ln(Comp)	(3) Ln(Comp)	(4) Ln(Comp)
Lagged BONUS	0.0411***	0.0473***	0.0448***	0.0407***
	(0.0138)	(0.0110)	(0.0144)	(0.0136)
Lagged DPAD	0.0619***	0.0467***	0.0781***	0.0486**
	(0.0193)	(0.0170)	(0.0284)	(0.0202)
L.BONUS × Large Holder	-0.00936		-0.0132	
	(0.00621)		(0.00906)	
L.DPAD × Large Holder	-0.0554***		-0.0390*	
	(0.0169)		(0.0230)	
L.BONUS × Strong Gov		-0.0113	-0.0193**	
		(0.00708)	(0.00787)	
L.DPAD × Strong Gov		-0.0298*	-0.0358	
		(0.0172)	(0.0223)	
BONUS × Combined Gov 33				-0.0232*
				(0.0120)
L.DPAD × Combined Gov 33				-0.0350
				(0.0349)
Observations	68134	59423	36383	36383

Discussion and Implications

Implications

Implied Magnitudes

- Calculate how much of each dollar generated by tax breaks go to top executives
- Relates to incidence of corporate taxes on wages
  (Harberger (1962) ... Fuest, Peichl and Siegloch (2018) ...)

Most Related Findings

- In what ways are these findings similar and different to the most related papers.

Implications for Determinants of Executive Pay

- Shareholder value view vs. rent extraction

Implications for Income Inequality

- Estimate of effects of tax breaks on average workers
- Compare estimates to assess within-firm inequality implications

Implied Magnitudes

Bonus Depreciation

- A one percentage point decrease in PV cost of investment via bonus depreciation raises compensation of the top five highest paid executives by 4.43% or by $593,000.

- Two ways to measure the cash generated by bonus depreciation

  Present Value Cash Flows: Average firm in sample does $314 million in investment per year. A one percentage point reduction in present value costs is equivalent to a $3.14 million present value tax break (this is the correct way to think about the real benefits of the policy).

  Current Cash Flows: 43% average bonus x $314 million x taxable 75% of the time = $101 million in cash flow generated by bonus depreciation for the average firm each year

- One conclusion: increase in top 5 executive compensation is only about 0.6% of current cash flows generated by bonus depreciation.

- A different conclusion: because the policy simply accelerates the cash flows, PV cash flow benefits are much smaller and **at large publicly traded corporations, every dollar of PV cash flows generated by bonus depreciation increases executive compensation of the five highest paid executives at the firm by just under 18.9 cents.**

Implied Magnitudes

DPAD

- A one percentage point decrease in PV cost of investment via bonus depreciation raises compensation of the top five highest paid executives by 3.33% or by $446,000.
- Average firm in sample with positive taxable income reports $297 million in taxable income. A one percentage point reduction yield $2.97 million per firm per year.
- **Every dollar of cash flows generated by the DPAD increases top five compensation by just under 14.9 cents.**

In sum

- Each present value dollar of tax breaks received by a firm increases the pay of the top five highest paid executives at the firm by between 14 and 19 cents.
- This result suggests a large part of the incidence of corporate tax decreases on wages benefits the very highest paid employees.

Determinants of Executive Pay

Two Views (Edmans, Gabaix and Jenter (2017)):

Shareholder Value Contracts are chosen to maximize shareholder value, taking into account competitive market for executives and need to provide adequate incentives (Rosen (1981), Kaplan and Rauh (2009), Kaplan and Rauh (2013)).

Rent Extraction Contracts are set by executives themselves to maximize their own rents (Bertrand and Mullainathan (2001), Bebchuk, Fried and Walker (2002), Bebchuk and Fried (2003)).

Support for Shareholder Value View

- Lower effective corporate tax rates $\rightarrow$ more potential value for executives to create
- Effects do not seems to be concentrated among CEO, executives sitting on board of directors

Support for Rent Extraction View

- Executives did nothing to increase firm performance
- Effects not concentrated among new hires
- Suggsting evidence of mitigation of effects at firms with stronger governance structures
- Asymetric effects of tax increases / decreases

Most Related Papers

Bertrand and Mullainathan (2001)

- show that CEO pay responds positively to luck where luck is defined as
  1. Large movements in oil prices (for oil executives)
  2. Changes in industry-specific exchange rates (for execs in the traded goods sector)
  3. year-to-year differences in mean industry performance
- effects are mitigated at better governed firms
- Davis and Hausman (2018) show oil shocks on energy exec pay 20 years later

Keller and Olney (2017)

- Exogenous export shocks unrelated to managerial decisions increase executive compensation

Similarities

- Luck increases managerial compensation
- Effects mitigated by stronger governance structures

Differences

- Increases are choices made by US federal government
- Federal tax code directly subsidizes exectuive compensation

Effect of Tax Breaks on the Income Inequality

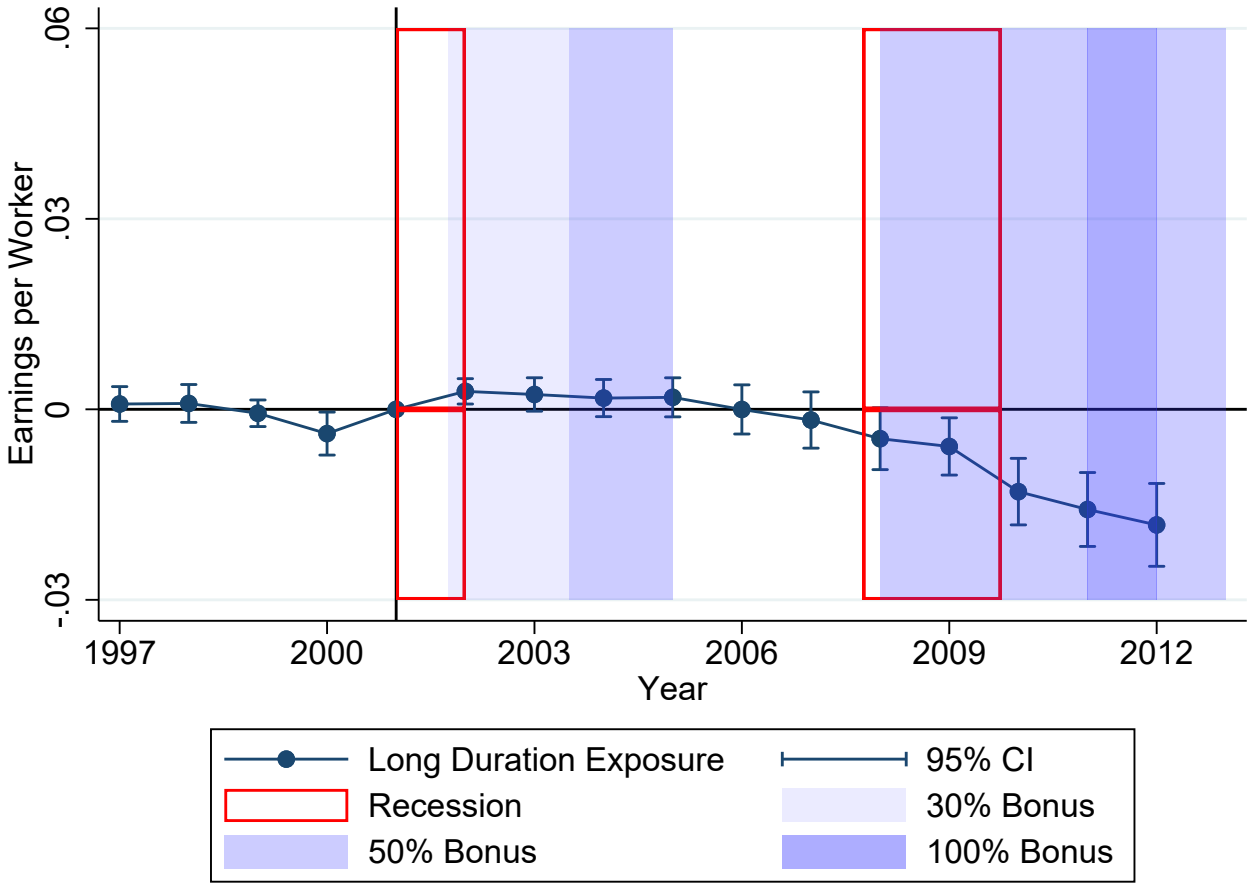
- It is possible that the tax breaks do not affect income inequality; if average worker benefits to the same extent as top 5 highest paid executives.
- Using CPS MORG data and the industry-level variation in each policy, I estimate the effect of tax breaks on earnings, hours, wage, and employment for the average US worker.
- Most conservative estimate suggests **effect of tax breaks on total earnings is more than 4 times larger for top 5 executives than for the average worker**

Table: Effect of Tax Breaks on Average US Wages, Hours, Employment

	(1) Log(Earnings)	(2) Log(Hours)	(3) Log(Wage)	(4) Employed %
BONUS	0.00970**	0.00597***	0.00396	0.00937**
	(0.00486)	(0.00227)	(0.00580)	(0.00471)
DPAD	-0.0000904	0.00320*	-0.00339	0.000916
	(0.00625)	(0.00175)	(0.00569)	(0.00151)
Observations	1283212	1249822	1248136	1772209
Adj. R2	0.322	0.0247	0.258	0.0316
Controls	✓	✓	✓	✓
Hours/Week	≥ 29	≥ 29	≥ 29	
Year FE	✓	✓	✓	✓
Industy FE	✓	✓	✓	✓

Effect of Tax Breaks on the Income Inequality

- In Garrett, Ohrn and Suárez Serrato (2020), we showed local exposure to bonus depreciation also has no positive wage effects.



Effect of Tax Breaks on the Income Inequality

Effect of Tax Breaks on Within-Firm Inequality

Classic Channel

decreases in corporate income taxes
$\rightarrow$ increase the returns to the owners of capital
$\rightarrow$ capital is held disproportionately by the wealthy / high incomes
$\rightarrow$ decreases in corporate income tax increase income / wealth inequality

(Nallareddy, Rouen and Serrato (2018) provides some recent evidence)

A New Channel

decrease in corporate income taxation
$\rightarrow$ increases executive compensation more than average workers
$\rightarrow$ increases income inequality even among workers at the same firms
(similar to Dobridge, Landefeld, and Mortenson (2019))

Concluding Comments

The Present and Future of Executive Compensation and Income Inequality

The Tax Cuts and Jobs Act of 2017

- The two US domestic hallmarks: (1) corporate statutory tax rate cut from 35 to 21% and (2) immediate expensing on all investments through 2022
- The DPAD is equivalent to a statutory tax rate cut for qualified income.
- TCJA's expensing provision is equivalent to 100% bonus depreciation.

Predicting the Present

- The results from this study suggests TCJA is currently exacerbating
  1. increasing trends in executive compensation
  2. increasing trends in income inequality
- To the extent that (1) TCJA puts downward pressure on worldwide corporate tax rates and (2) the mechanisms governing executive compensation in the US are similar in other contexts, TCJA is likely increasing executive compensation and inequality throughout the world.

Thank you for your comments and feedback.

ohrneric@grinnell.edu

www.ericohrn.com

References

Bebchuk, Lucian A., Alma Cohen, and Allen Ferrell. 2009. "What Matters in Corporate Governance." *Review of Financial Studies*, 22(2): 783–827.

Bebchuk, Lucian Arye, and Jesse M Fried. 2003. "Executive compensation as an agency problem." *Journal of economic perspectives*, 17(3): 71–92.

Bebchuk, Lucian Arye, Jesse M Fried, and David I Walker. 2002. "Managerial power and rent extraction in the design of executive compensation." National bureau of economic research.

Bertrand, Marianne, and Sendhil Mullainathan. 2001. "Are CEOs rewarded for luck? The ones without principals are." *The Quarterly Journal of Economics*, 116(3): 901–932.

Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan. 2004. "How Much Should We Trust Differences-In-Differences Estimates?" *The Quarterly Journal of Economics*, 119(1): 249–275.

Chetty, Raj, and Emmanuel Saez. 2005. "Dividend Taxes and Corporate Behavior: Evidence from the 2003 Dividend Tax Cut." *Quarterly Journal of Economics*, 120(3): 791–833.

Davis, Lucas W, and Catherine Hausman. 2018. "Are energy executives rewarded for luck?" National Bureau of Economic Research.

Dyreng, Scott D, Michelle Hanlon, Edward L Maydew, and Jacob R Thornock. 2017. "Changes in corporate effective tax rates over the past 25 years." *Journal of Financial Economics*, 124(3): 441–463.

Edmans, Alex, Xavier Gabaix, and Dirk Jenter. 2017. "Executive compensation: A survey of theory and evidence." National Bureau of Economic Research.

Frydman, Carola, and Dirk Jenter. 2010. "CEO compensation." *Annu. Rev. Financ. Econ.*, 2(1): 75–102.

Fuest, Clemens, Andreas Peichl, and Sebastian Siegloch. 2018. "Do higher corporate taxes reduce wages? Micro evidence from Germany." *American Economic Review*, 108(2): 393–418.

Garrett, Daniel G, Eric Ohrn, and Juan Carlos Suárez Serrato. 2020. "Tax Policy and Local Labor Market Behavior." *American Economic Review: Insights*.

Harberger, Arnold C. 1962. "The Incidence of the Corporation Income Tax." *Journal of Political Economy*, 70(3): 215–240.

Kaplan, Steven N, and Joshua Rauh. 2009. "Wall Street and Main Street: What contributes to the rise in the highest incomes?" *The Review of Financial Studies*, 23(3): 1004–1050.

Kaplan, Steven N, and Joshua Rauh. 2013. "It's the market: The broad-based rise in the return to top talent." *Journal of Economic Perspectives*, 27(3): 35–56.

Keller, Wolfgang, and William W Olney. 2017. "Globalization and executive compensation." National Bureau of Economic Research.

Nallareddy, Suresh, Ethan Rouen, and Juan Carlos Suárez Serrato. 2018. "Corporate Tax Cuts Increase Income Inequality." National Bureau of Economic Research.

Ohrn, Eric. 2018. "The Effect of Corporate Taxation on Investment and Financial Policy: Evidence from the DPAD." *American Economic Journal: Economic Policy*, 10(2): 272–301.

Piketty, Thomas, Emmanuel Saez, and Gabriel Zucman. 2017. "Distributional national accounts: methods and estimates for the United States." *The Quarterly Journal of Economics*, 133(2): 553–609.

Rosen, Sherwin. 1981. "The economics of superstars." *The American economic review*, 71(5): 845–858.

Smith, Matthew, Owen Zidar, Eric Zwick, et al. 2020. "Top Wealth in America: New Estimates and Implications for Taxing the Rich."

Zwick, Eric, and James Mahon. 2017. "Tax Policy and Heterogeneous Investment Behavior." *The American Economic Review*, 107(1): 217–248.

Bonus Depreciation Example

Table: Example of Federal Tax Impact of 50% Bonus

Year	1	2	3	4	5	6	7	8	Total
MACRS Deduction	25	21.43	15.31	10.93	8.75	8.74	8.75	1.09	100
τ_f x Deduction	8.75	7.50	5.36	3.83	3.06	3.06	3.06	0.38	35
PV(τ_f x Deduction)									28.79
50% Bonus Ded.	62.5	10.72	7.65	5.47	4.37	4.37	4.37	0.545	100
τ_f x Deduction	21.88	3.75	2.68	1.91	1.53	1.53	1.53	0.19	35
PV(τ_f x Deduction)									31.89

Notes: This table calculates the present value of federal tax deductions for a $100 investment under both a traditional 7-year accelerated depreciation regime and under a 50% bonus regime. The federal corporate tax rate is assumed to be 35%. The discount rate is assumed to be 10%.

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Descriptive Statistics

Table: Descriptive Statistics

	mean	std dev	25th Percentile	75th Percentile	obs
Policy Variables					
BONUS	1.232	1.299	0.000	2.010	127,260
DPAD	0.320	0.664	0.000	0.233	127,248
BONUS (50% rate)	2.088	0.544	1.857	2.144	51,368
DPAD (9% rate)	0.904	1.076	0.000	1.893	24,913
Executive Compensation					
Total Comp Awarded	2.726	3.977	0.728	2.936	127,260
Total Comp Realized	2.719	4.563	0.594	2.698	127,260
Total Current	0.769	0.803	0.344	0.868	127,260
Total NonCurrent	1.956	3.528	0.259	2.033	127,260
Executive Controls					
Experience	5.055	3.809	2.000	7.000	127,260
Female	0.062	0.241	0.000	0.000	127,260
Board	0.327	0.469	0.000	1.000	127,260
Firm Controls					
Firm Size	14662.025	93404.529	612.208	6450.916	127,227
ROA	0.022	0.212	0.009	0.073	127,204
R&D Expenditure	106.947	548.425	0.000	30.616	127,260

back

Alternative Specifications

Table: Effect of Tax Breaks on Executive Compensation; Alternative Specifications

	(1) Ln(Comp)	(2) Ln(Comp)	(3) Ln(Comp)	(4) Ln(Comp)	(5) Ln(Comp)
Lagged BONUS	0.0554***	0.0374***	0.0412***	0.0232**	0.0475***
	(0.0118)	(0.0105)	(0.0119)	(0.00960)	(0.0110)
Lagged DPAD	0.0306**	0.0331***	0.0324*	0.0530	0.0338**
	(0.0146)	(0.0117)	(0.0175)	(0.0341)	(0.0155)
Year FE	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓
2004 Char. x Year FE Controls	✓				
Growth Trend x Year FE		✓			
Dec FY			✓		
Domestic Firms				✓	
Trimmed Tax Breaks					✓
Observations	84817	105261	87727	43496	123683

Notes: This table presents coefficient estimates of the effect of Lagged BONUS and Lagged DPAD on executive compensation. The outcome variable in all specifications is the log of Total Comp Awarded. All specifications include firm and year fixed effects as well as controls for gender and experience. All specifications other than (1) include controls for log firm size. Specification (1) includes terciles of Log(Total Comp) growth during the preperiod interacted with year fixed effects. Specification (2) includes indicators for terciles of lagged ROA, lagged log firm size, and lagged log Market-to-Book interacted with year indicators. Specification (3) limits the sample to firms with no pre-tax foreign income. Specification (4) limits the sample to firms with December fiscal year ends. Specification (5) includes tax breaks winsorized at the 3rd and 97th percentiles in each year. Standard errors are presented in parentheses and are clustered at the four-digit NAICS level * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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