

Firm Responses to Book Income Alternative Minimum Taxes

Jordan Richmond, Princeton University

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Introduction

- In 2018 Amazon had \$10 billion in income, paid 0 taxes
- Deductions and credits meant to incentivize productive economic behavior reduce tax bills, sometimes all the way to 0
- Alternative minimum taxes (AMTs) assign a lower tax rate to a broader tax base that excludes many deductions and credits
 - ▶ Raise revenue from profitable firms
 - ▶ Limit economic incentives
- Renewed interest in using book income as AMT base (Biden tax plan, OECD negotiations for global minimum tax)

Research Question

- How do firms respond to an AMT on book income?
 - ▶ How elastic is a book income tax base?
 - ▶ Do firms manage earnings to avoid an AMT on book income?
 - ▶ Do firms distort production and investment because AMT limits deductions?

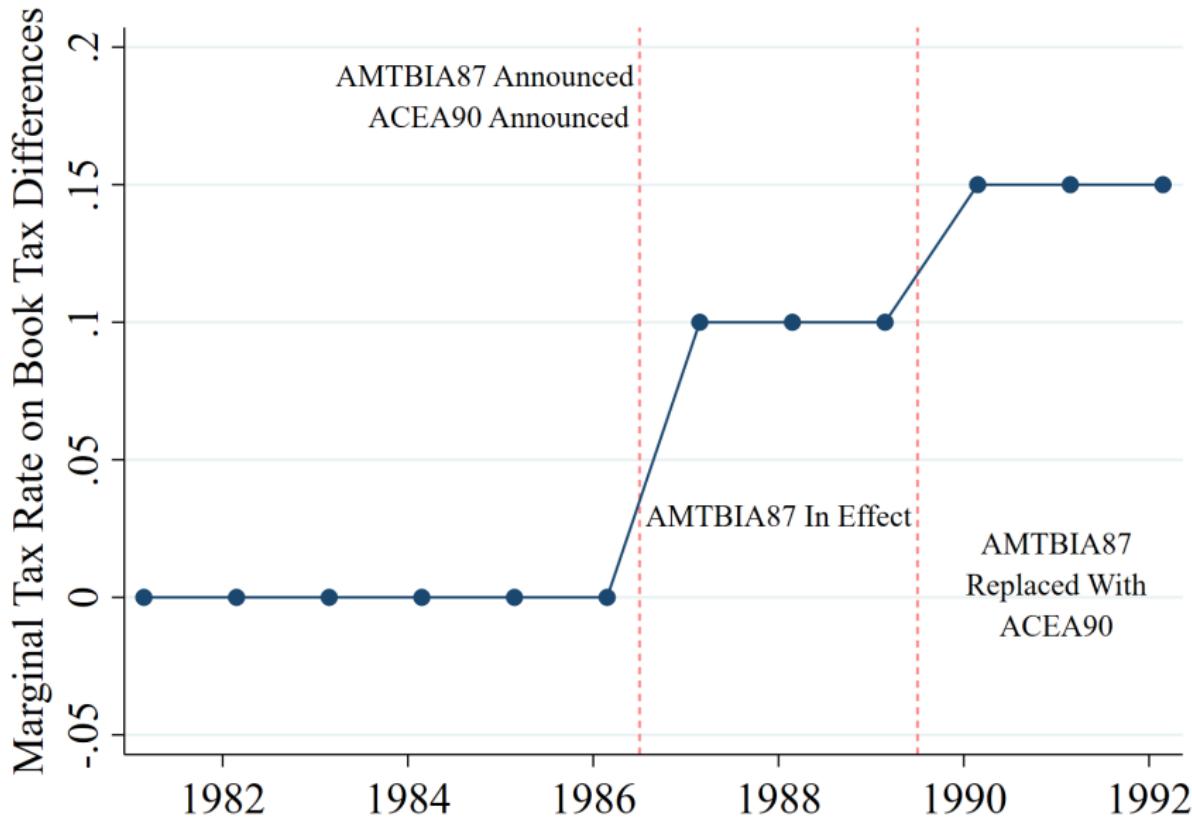
This Paper

- Diff-in-Diff exploiting 1987 introduction of AMT book income adjustment (AMTBIA87)
 - ▶ Use balanced Compustat panel 1983-1992
 - ▶ Compare firms with low effective tax rates (ETRs) that face AMTBIA87 to firms with higher ETRs that do not
 - ▶ Treatment: $ETR < 23\%$, Control: $ETR \geq 23\%$ ▶ Derivation
 - ▶ Average ETR over 1984-86 for firms with persistently low ETRs

Findings

- Book income tax base is not responsive to AMTBIA87, firms do not manage their earnings
 - ▶ $\varepsilon_{BI,TB} \in [-1.20, 1.36]$ and $\varepsilon_{BI,EM} \in [-0.28, 0.32]$
- No evidence that AMTBIA87 causes firms to modify production or investment policies
 - ▶ Investment response per 1% increase in tax rate $\in [-0.29\%, 0.09\%]$
- Revenue scores close to mechanical tax calculations, differ significantly from think-tank estimates

Minimum Tax Policy Timeline



Book Tax Differences

<i>Permanent BTDs</i>	Book Income	Taxable Income
State & Local Taxes	No	Yes
Tax Exempt Income	Yes	No
Fines	Yes	No
Meals & Entertainment	100%	50%
Interest on Govt Bonds	Yes	No
<i>Temporary BTDs</i>	Book Income	Taxable Income
Depreciation	Straight Line	Accelerated
Mark to Market	Yes	No
Rental Income	Smooth	Year of Contract
Bad Debts	Estimated on Issue	When Realized

► Temp BTD Details

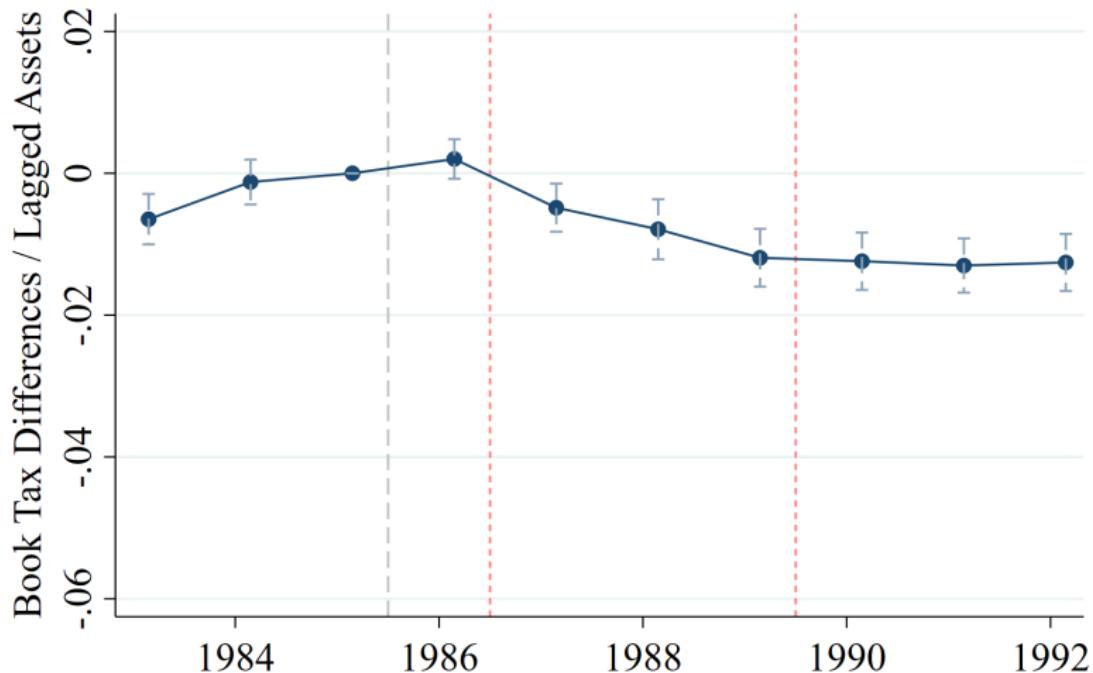
Specification

- Differences in differences setup

$$Y_{it} = \sum_{\tau=1983, \tau \neq 1985}^{1992} (\beta_\tau \cdot Treat_{i\tau}) + \beta_1 X_{it} + \delta_t + \gamma_i + \varepsilon_{it}$$

- $Treat_i = 1$ in post-period if $ETR_{84-86} < 23\%$, 0 otherwise
- $Treat_{i\tau}$ is interaction of $Treat_i$ with year dummies

Book Tax Differences Response



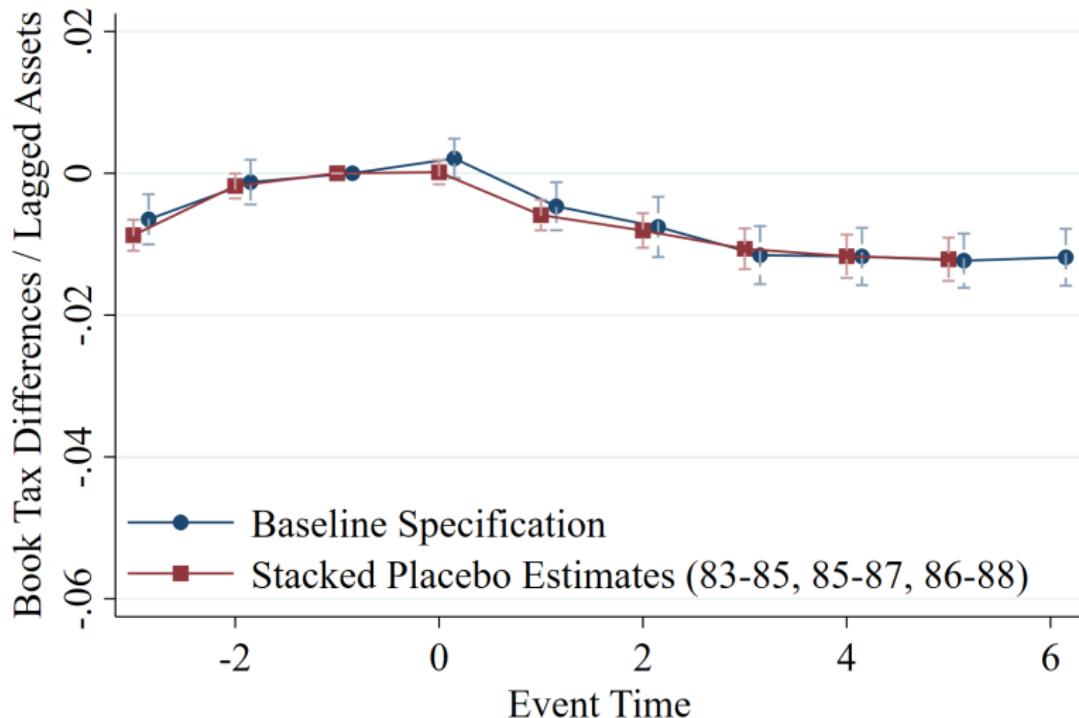
► Temp vs Perm

► Levels

► Scaled by Avg Assets

► Scaled by Tax Liability

Book Tax Differences Mean Reversion



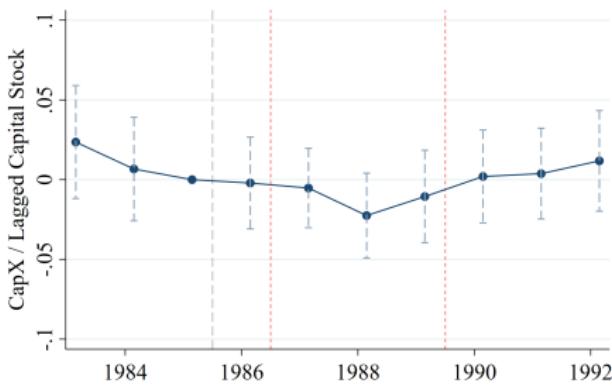
Earnings Management and Investment Responses

- *BTD* measure earnings management **and** tax planning behavior
- Do firms manage their earnings? Use discretionary accruals
 - ▶ Accruals: income for which cash has not yet been exchanged
 - ▶ Residualize on current economic conditions ▶ Construction
- Do firms change investment or production policies?

Earnings Management and Investment Responses



(a) Earnings Management



(b) Investment

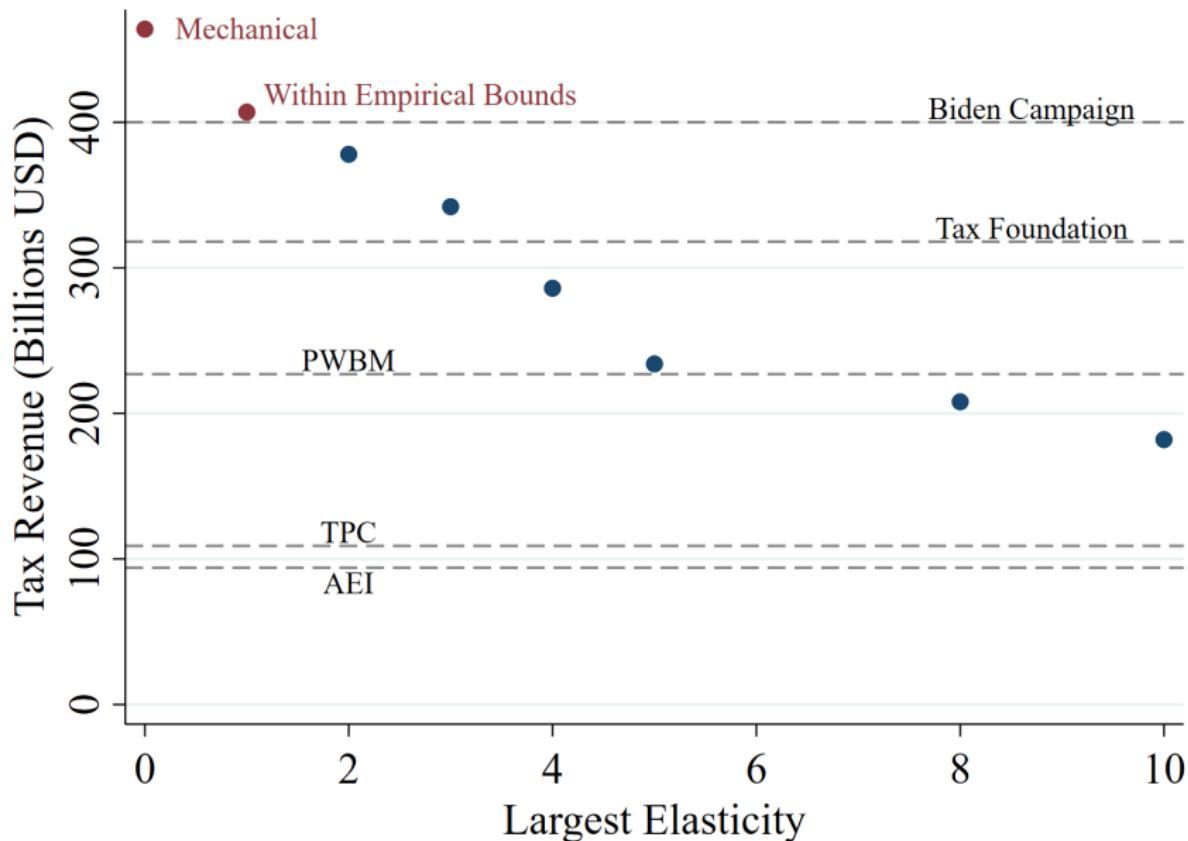
► Levels ► Scaled by Avg Assets ► Scaled by Tax Liability ► Sales ► COGS ► Debt ► Employment

- Reject downwards earnings management $> 1\%$ of lagged assets
- Reject investment declines $> 0.3\%$ per 1% change in the tax rate

Revenue Scores

- Project revenue implications of 1 proposed policy
 - ▶ 15% minimum tax on book income for firms with >\$100M in income
 - ▶ Assume book income elasticities and project revenues over 10 year scoring window ▶ Details

Think-Tank Scores Use Large Elasticities



Conclusion

- Estimate null book income and earnings management responses to AMTBIA87
- Estimate null real responses to AMTBIA87
- Existing revenue scores of proposed book income AMTs use larger elasticities
- These results do not necessarily suggest implementing a book income AMT is good policy
 - ▶ Should the FASB control part of the tax base?
 - ▶ Should we use minimum taxes as a backstop?

Appendix

Robustness

- Different samples, treatment definitions, controls, scalings

- ▶ DA Levels
- ▶ DA by Avg At
- ▶ DA by Lag At
- ▶ DA by Tax Liability
- ▶ BTD Levels
- ▶ BTD by Avg At
- ▶ BTD by Lag At
- ▶ BTD by Tax Liability
- ▶ temp BTD Levels
- ▶ temp BTD by Avg At
- ▶ temp BTD by Lag At
- ▶ temp BTD by Tax Liability
- ▶ perm BTD Levels
- ▶ perm BTD by Avg At
- ▶ perm BTD by Lag At
- ▶ perm BTD by Tax Liability

- Mean reversion

- ▶ DA mean reversion

- Measurement of accruals

- ▶ DA Levels definitions
- ▶ DA by Avg At definitions
- ▶ DA by Lag At definitions
- ▶ DA by Tax Liability definitions

Earnings Management Heterogeneity

- Null earnings management estimates across the firms size distribution

▶ DA Size Quintiles ▶ DA Scaled by Avg Assets Size Quintiles ▶ DA Scaled by Lagged Assets Size Quintiles

- Null earnings management estimates across industries (noisy in levels)

▶ DA Industry ▶ DA Scaled by Avg Assets Industry ▶ DA Scaled by Lagged Assets Industry

Policy

- AMTBIA87 imposed a 10% minimum tax on the difference between book income (BI) and taxable income (TI)
- Rate raised to 15% in 1990 (ACEA90) ▶ Details

Minimum Tax Policy Details

- AMTBIA87 imposed 20% minimum tax on half the difference between book income and taxable income plus depreciation
- Law specifies that AMTBIA87 will be replaced by Adjusted Current Earnings adjustment (ACEA90) in 1990
 - ▶ ACEA90 imposed 20% tax on 75% of difference between ACE and taxable income plus depreciation
 - ▶ ACE uses tax principles to try to construct a measure of income as broad as book income

Constructing Discretionary Accruals

- Total accruals: $TA_t = \Delta A_t - \Delta Liab_t - \Delta Cash_t + \Delta Taxes_t - Dept_t$
- Discretionary accruals: residual of a regression of total accruals on assets, change in sales and PPE. “Jones (1991) Model”

$$\frac{TA_{i,t}}{A_{i,83-86}} = \sum_{j=1}^J \beta_{1,j} \frac{1}{A_{i,83-86}} + \beta_{2,j} \Delta \frac{Sales_{i,t}}{A_{i,83-86}} + \beta_{3,j} \frac{PPE_{i,t}}{A_{i,83-86}} + \psi_j + \varepsilon_{i,t}$$

$$DA_{i,t} = TA_{i,t} - \widehat{TA}_{i,t}$$

- Construct in levels, and scaled by average pre-period assets and lagged assets
- Run regression on all firms in pre-period, make predictions across full time series

Relating ETRs to AMT Liability

$$BIA = 0.5(BI - (TI + TPA))$$

$$AMT = \max\{0.2(TI + TPA + BIA) - \tau TI, 0\}$$

$$\frac{AMT}{BI} = \max\{0.1 + 0.1f + [(0.1 - \tau) - 0.1f] \frac{TI}{BI}, 0\}$$

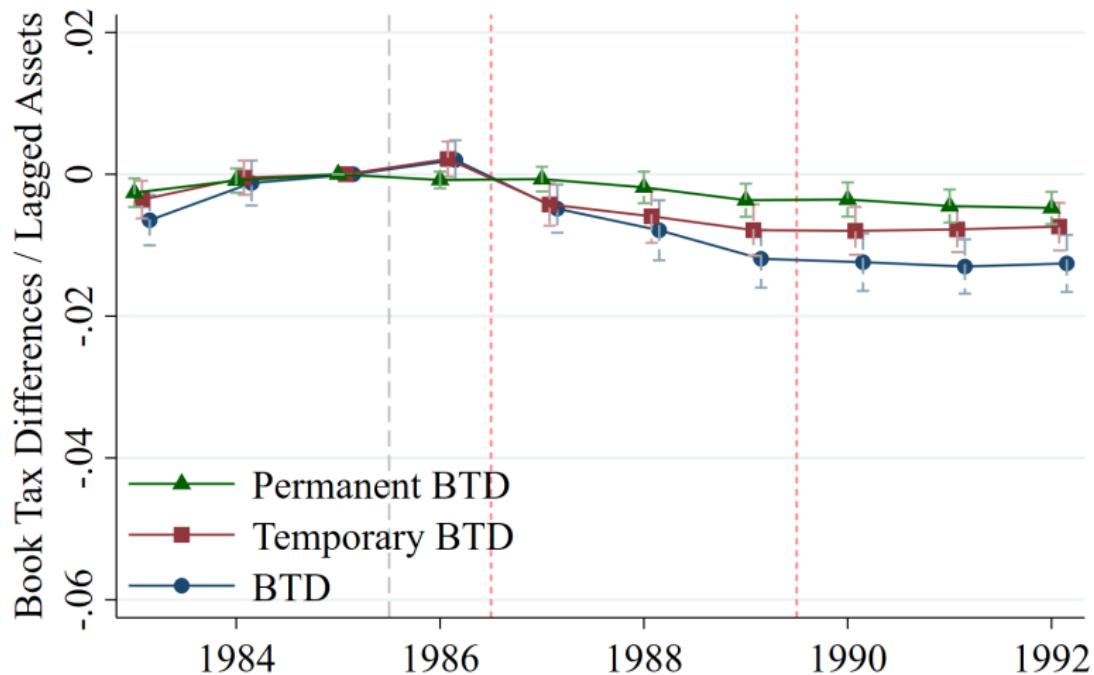
$$\frac{AMT}{BI} = \max\{0.1 + 0.1f - [\frac{\tau - 0.1}{\tau} + \frac{0.1f}{\tau}] ETR, 0\}$$

So a firm has positive AMT liability if

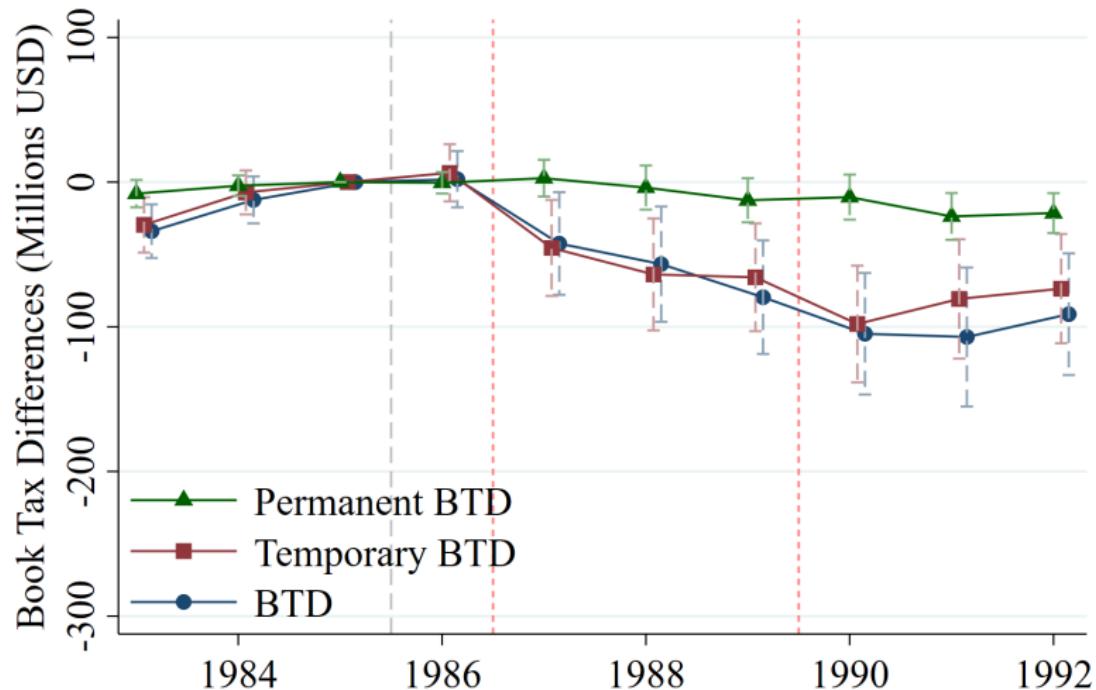
$$ETR_{87} < \frac{\tau_{87}(0.1 + 0.1f)}{(\tau_{87} - 0.1) + 0.1f} = 0.2 \implies ETR_{86} < 0.23$$

► Empirical Strategy

Book Tax Differences Response

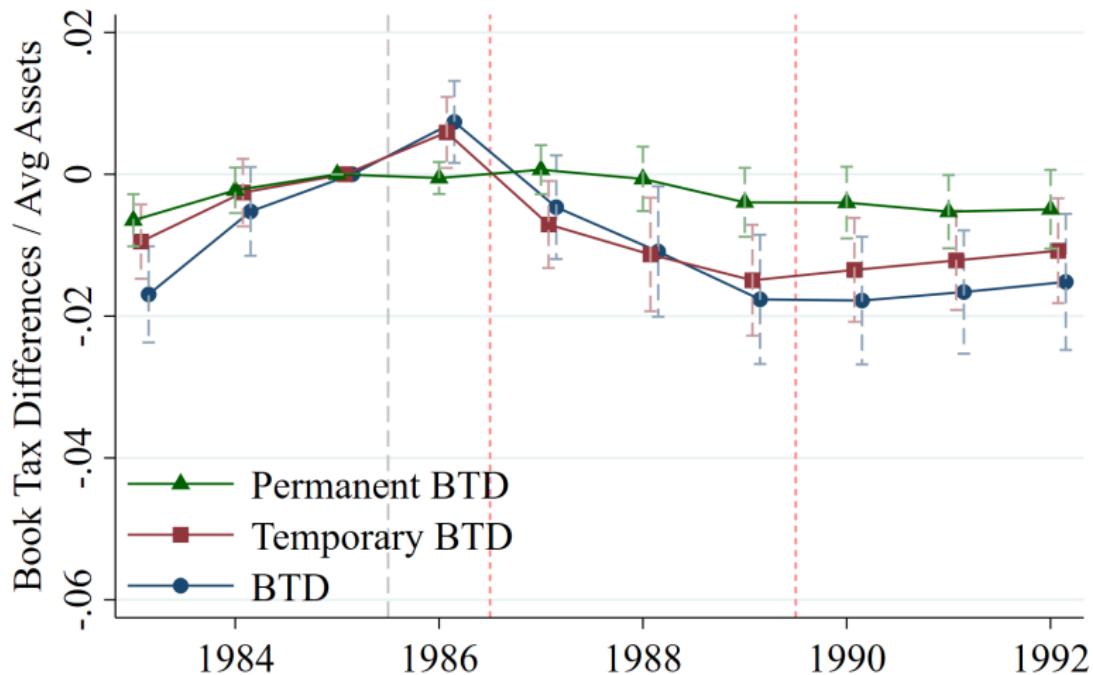


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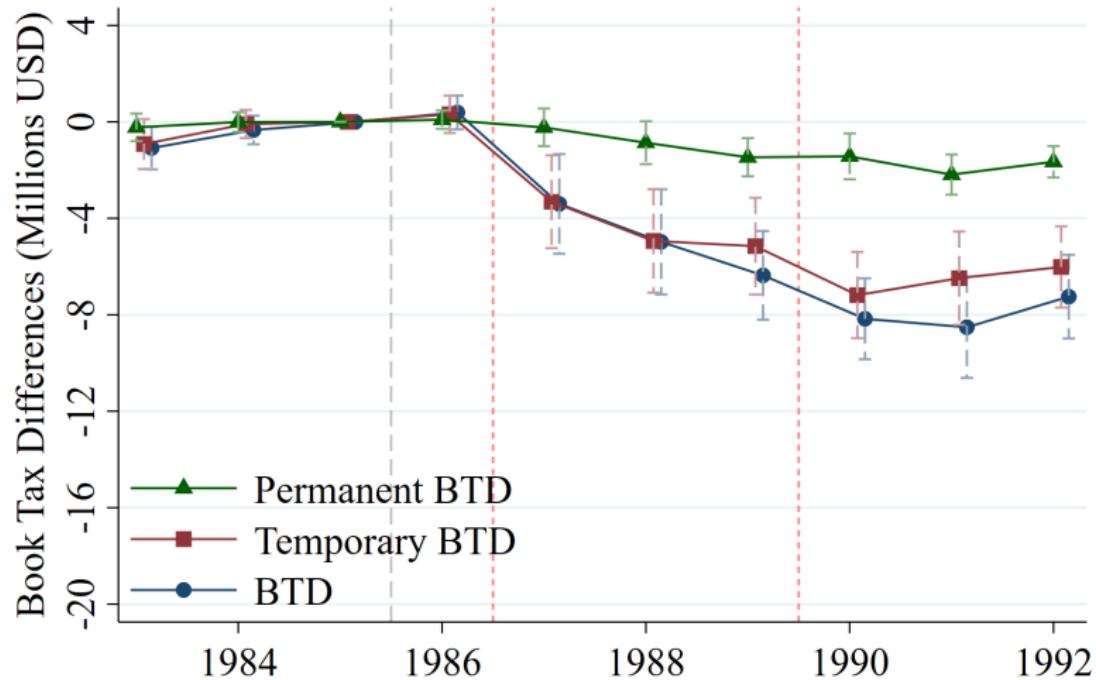
► Scaled by Lagged Assets

Book Tax Differences Response

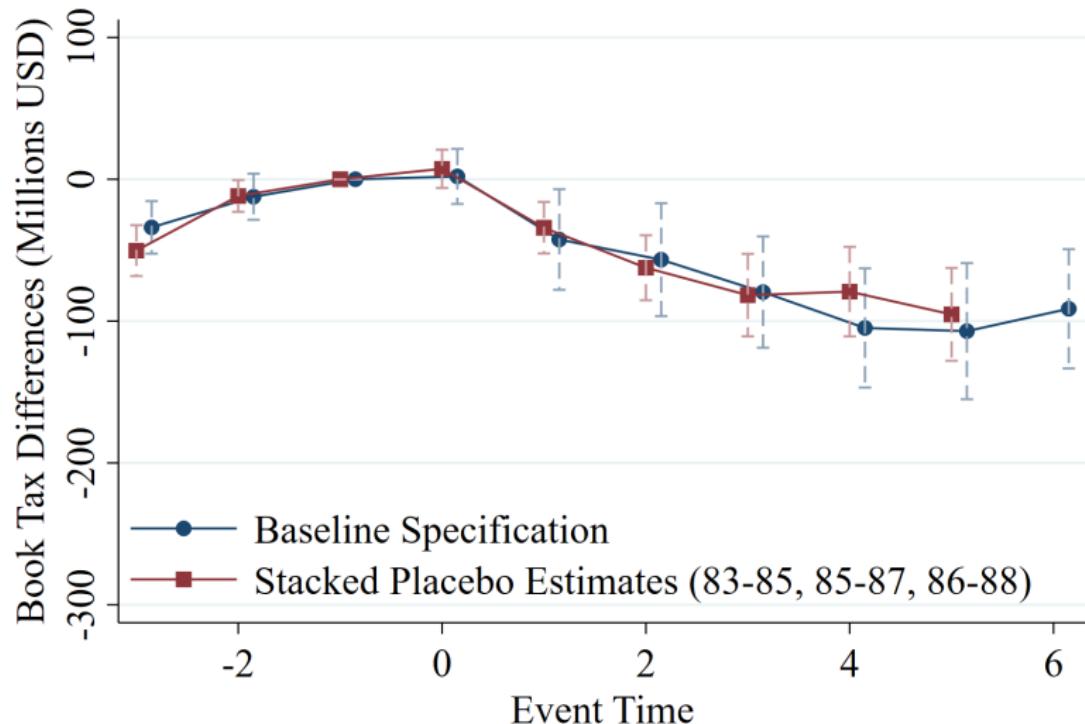


► Scaled by Lagged Assets

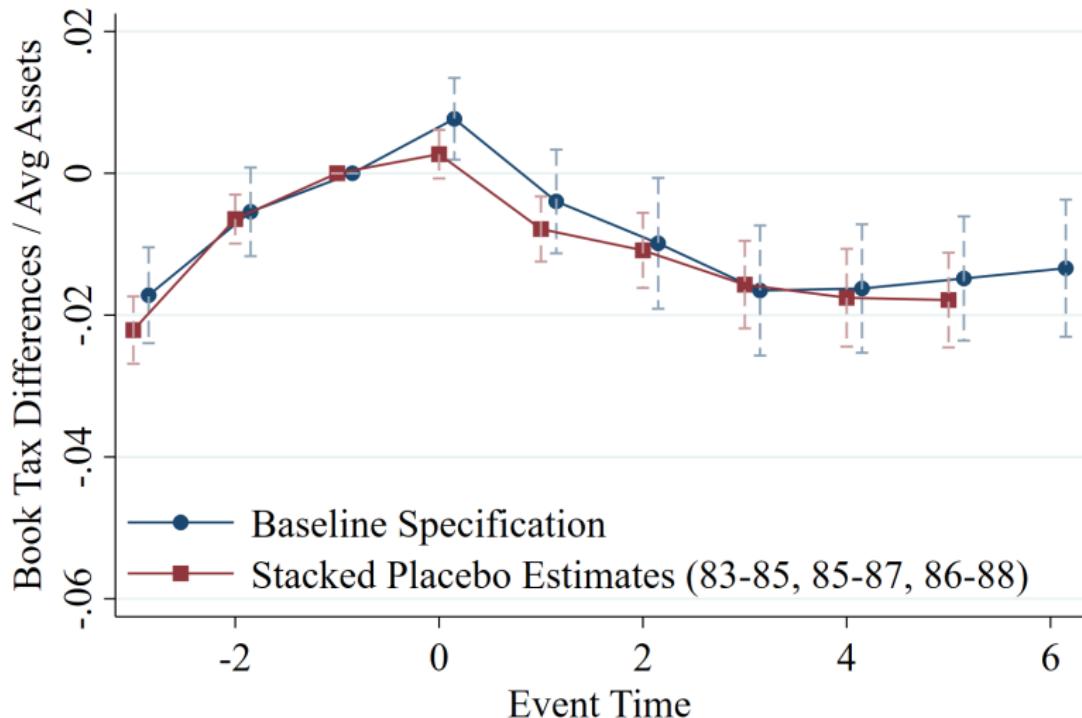
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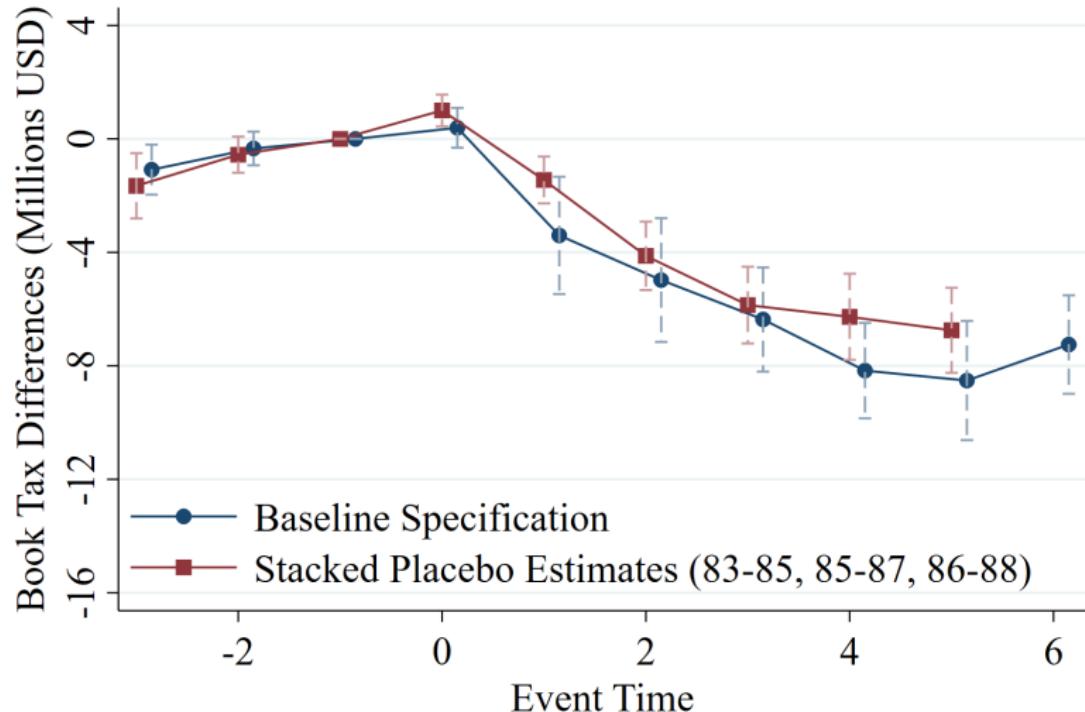
Book Tax Differences Mean Reversion



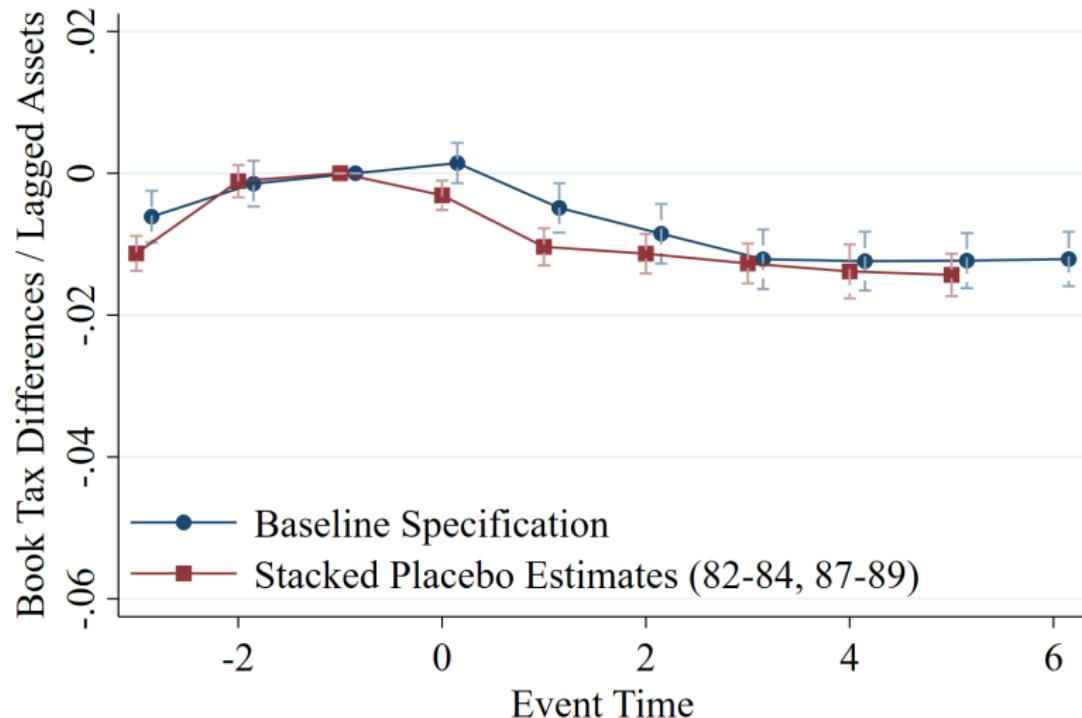
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Book Tax Differences Mean Reversion

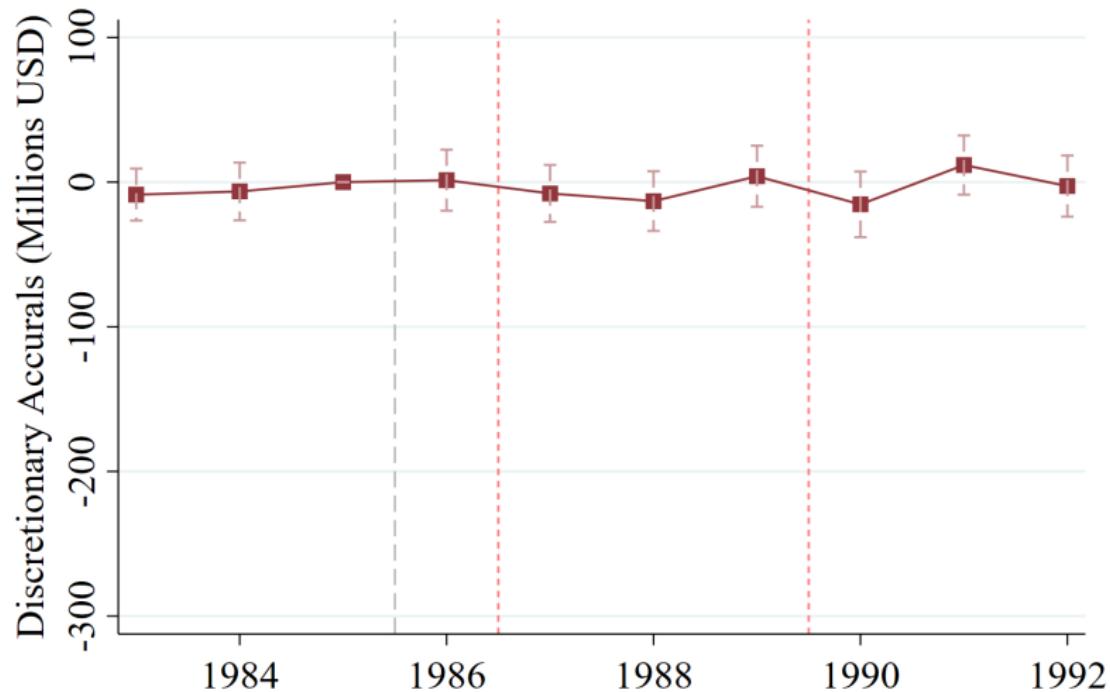


Deferred Tax Expense

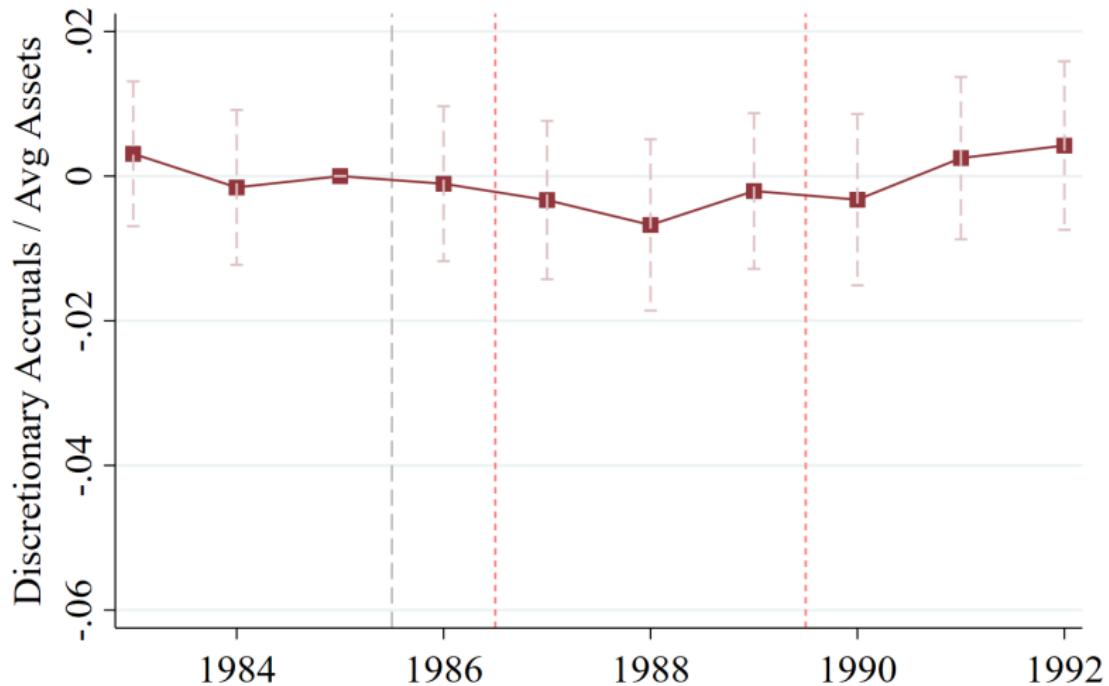
- Firms report BI , current tax expense and deferred tax expense on their financial statements
- $BTD = BI - \widehat{TI}$. I estimate $\widehat{TI} = \text{current tax expense}/\tau$
- Temporary BTD reclassify tax expense from current to deferred
 - ▶ \$100 bonus depreciation in excess of straight line depreciation creates a \$100 BTD and reduces TI by \$100
 - ▶ For accounting purposes, the firm should have owed $\$100\tau$ in current tax expense based on its current period taxable book income
 - ▶ The $\$100\tau$ is recorded as deferred tax expense. It will “come due” in some future period when bonus is less than straight line depreciation

▶ BTD

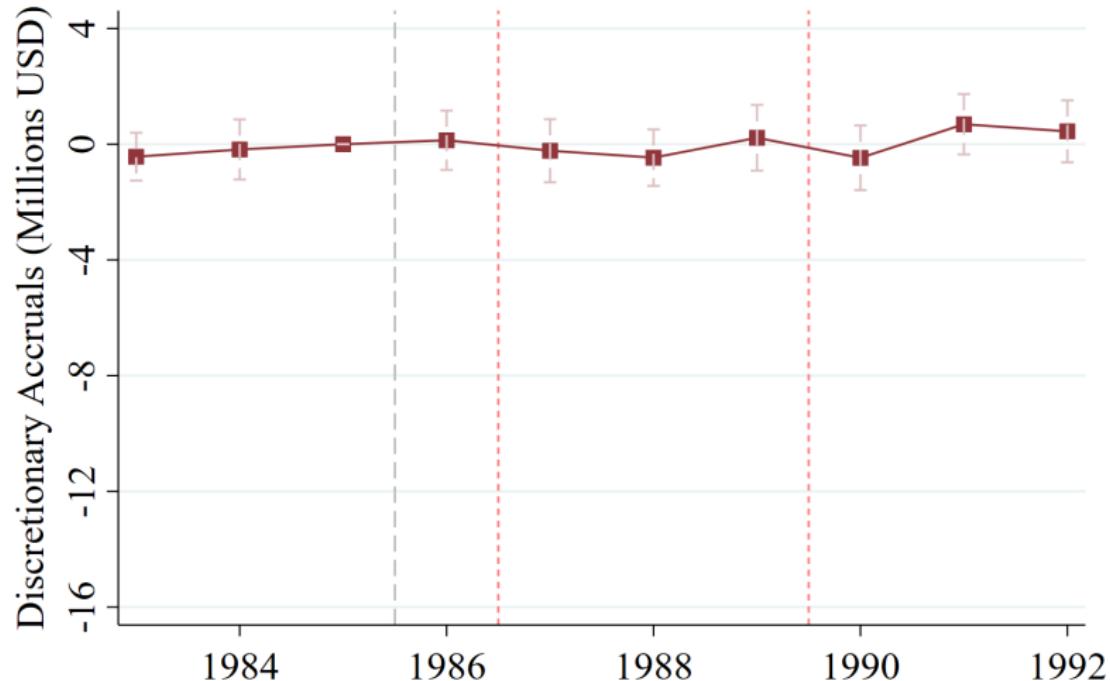
Discretionary Accrual Responses

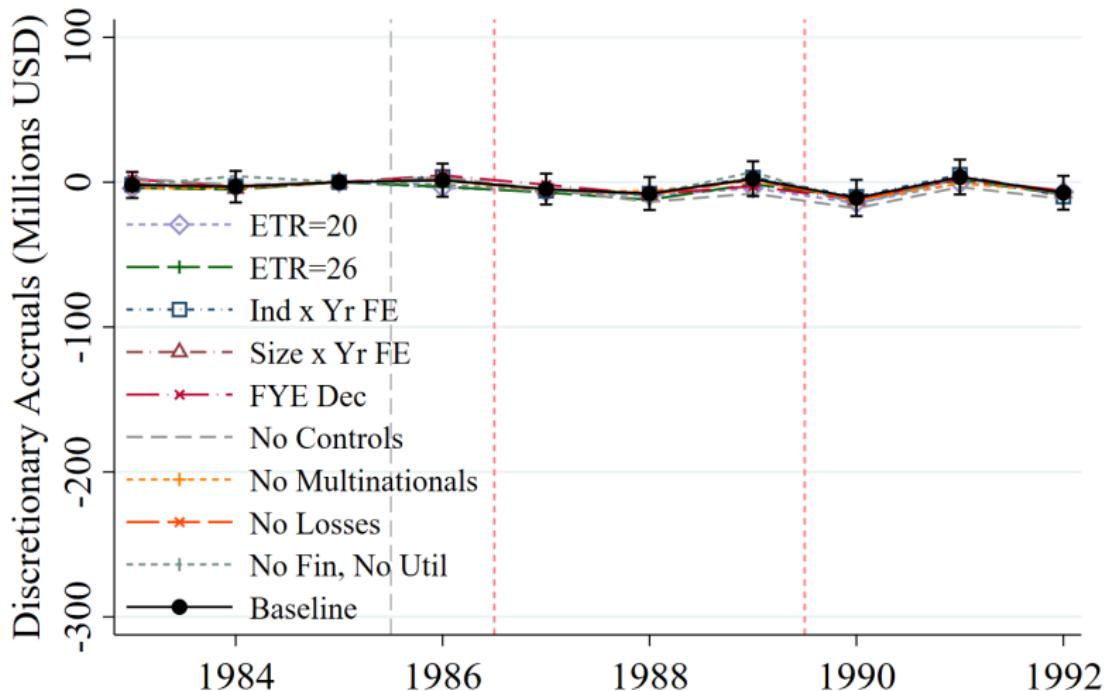


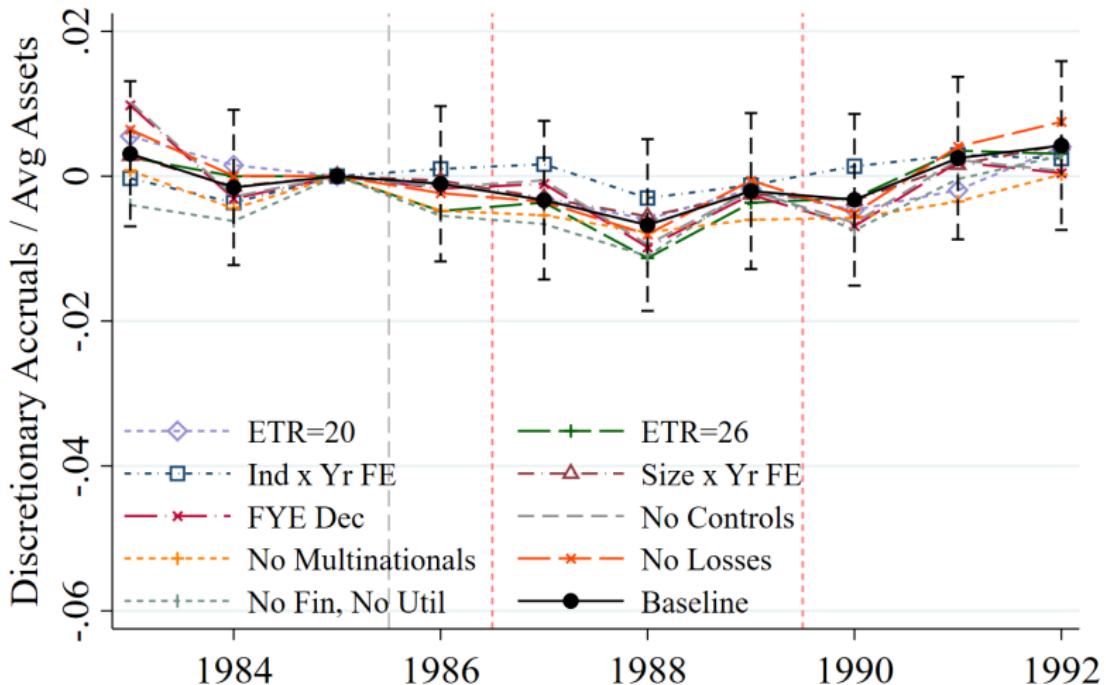
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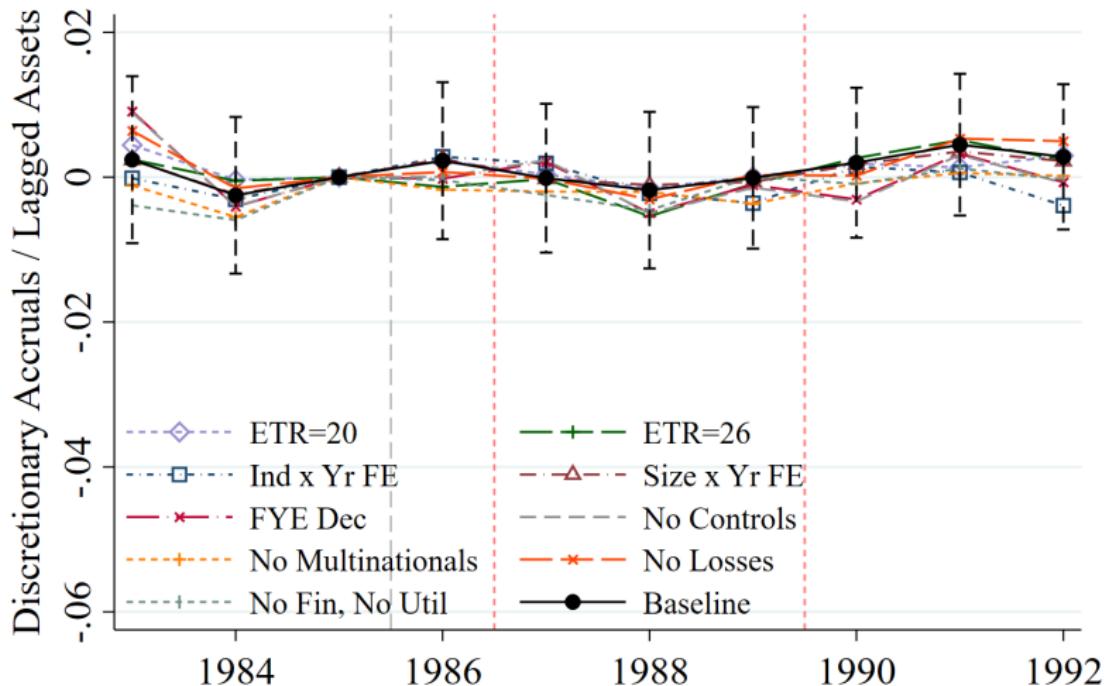


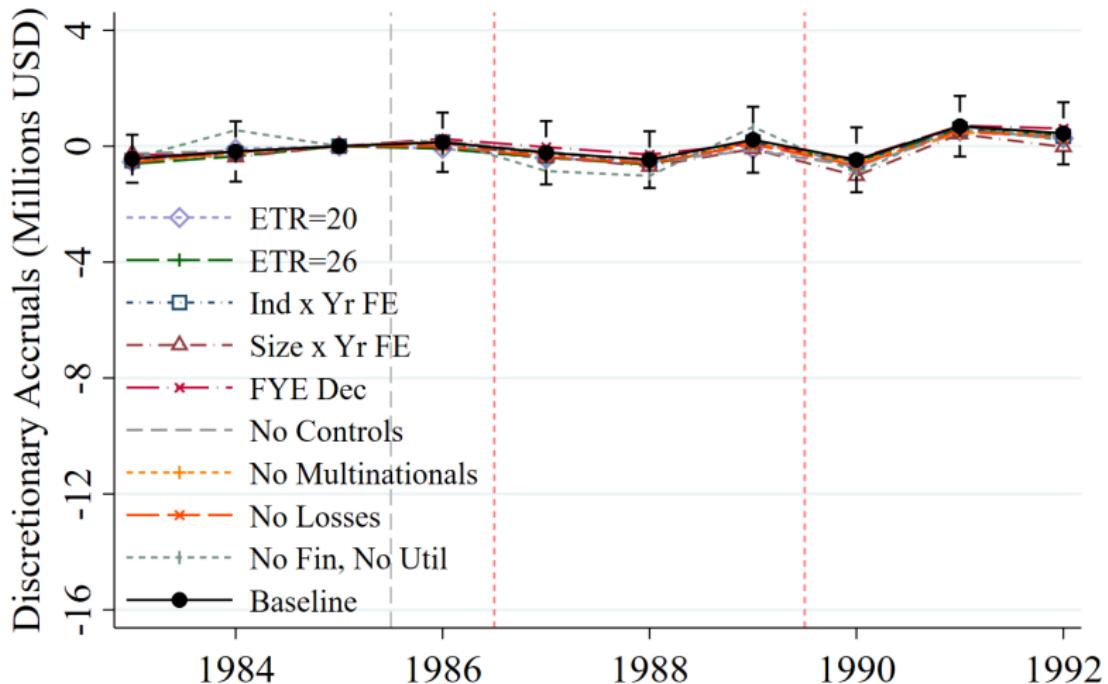
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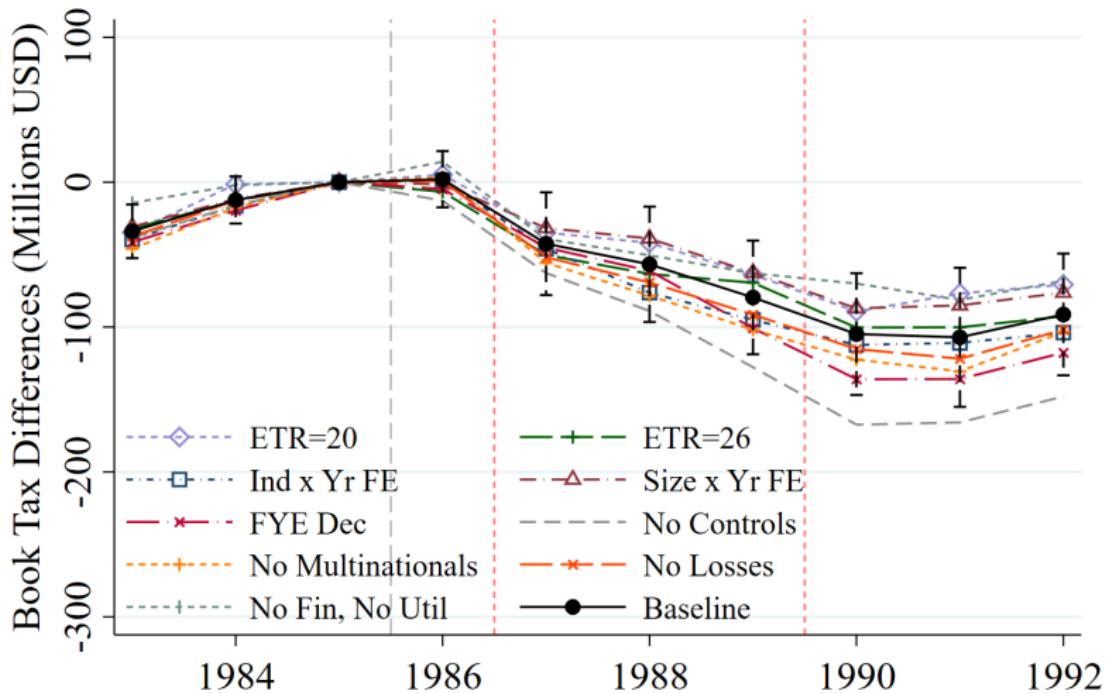


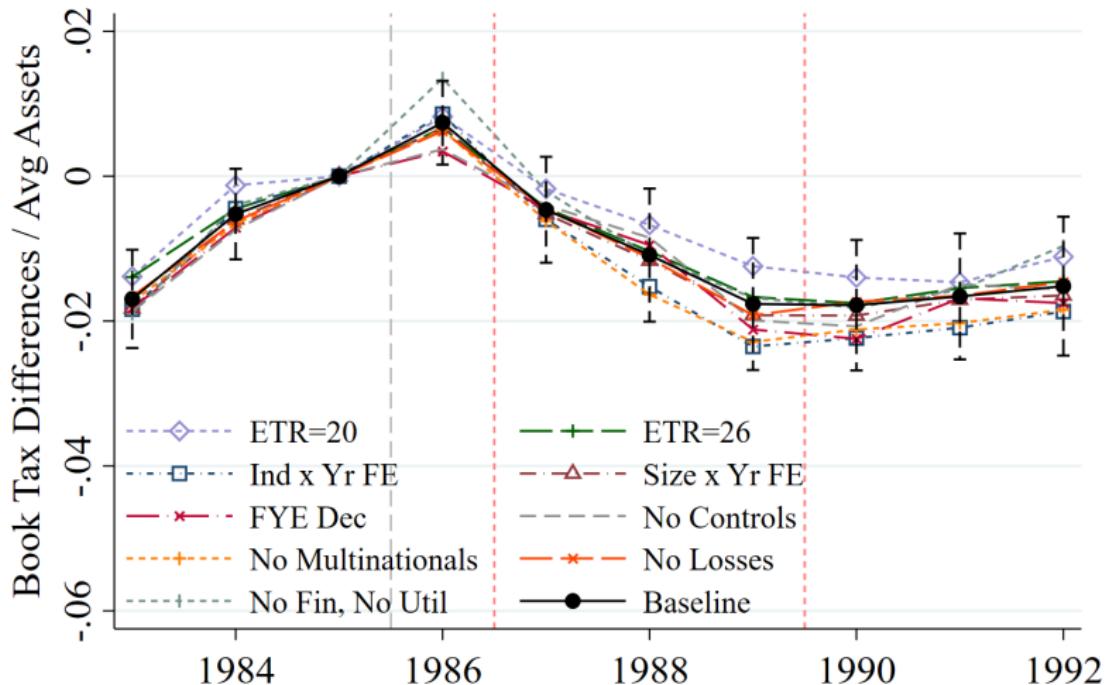


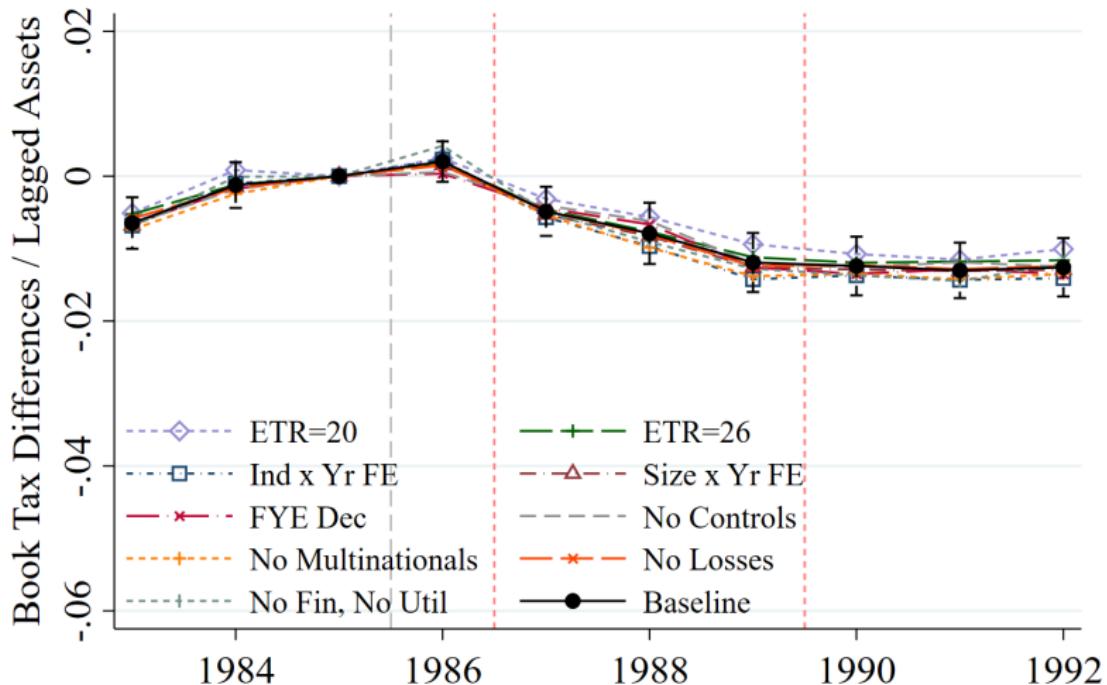


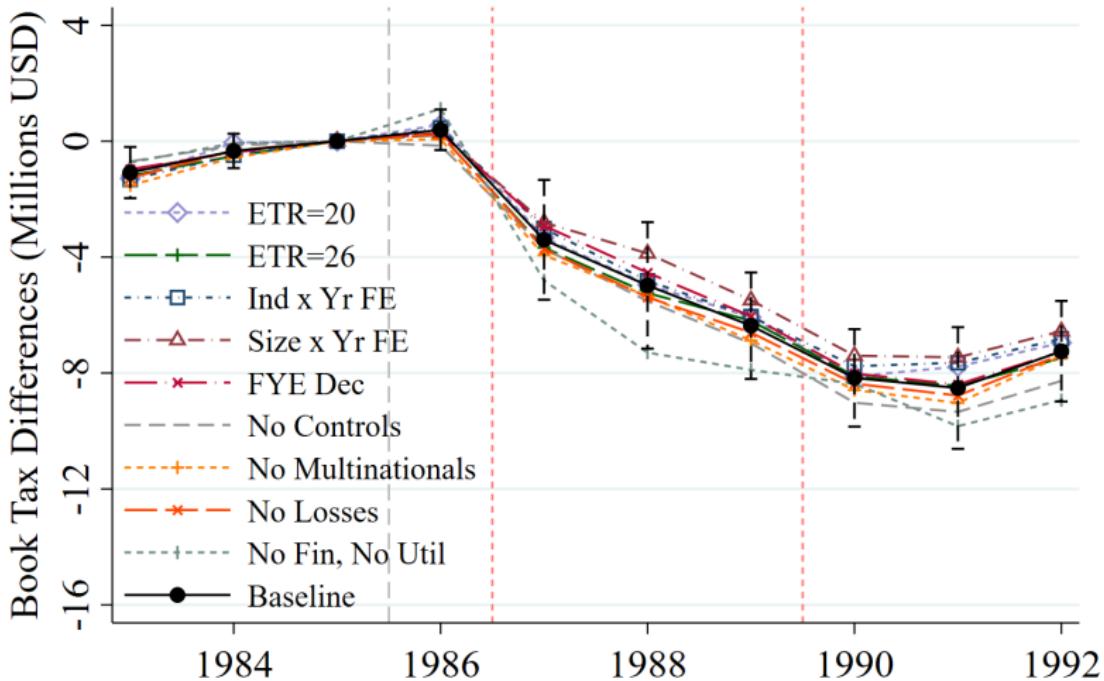


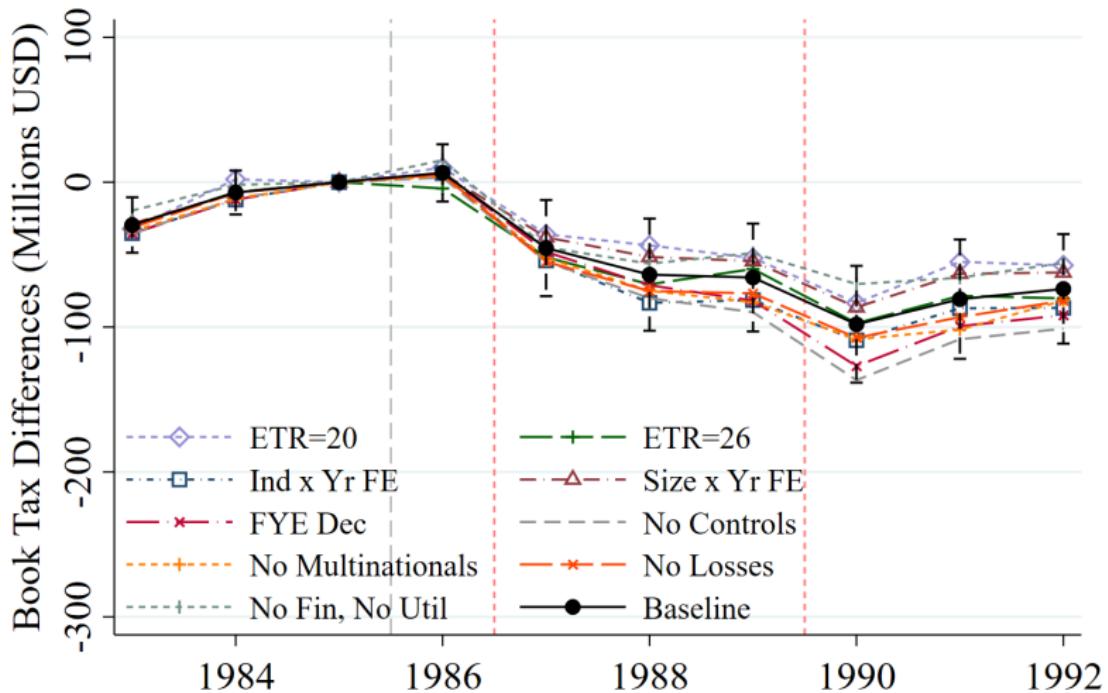


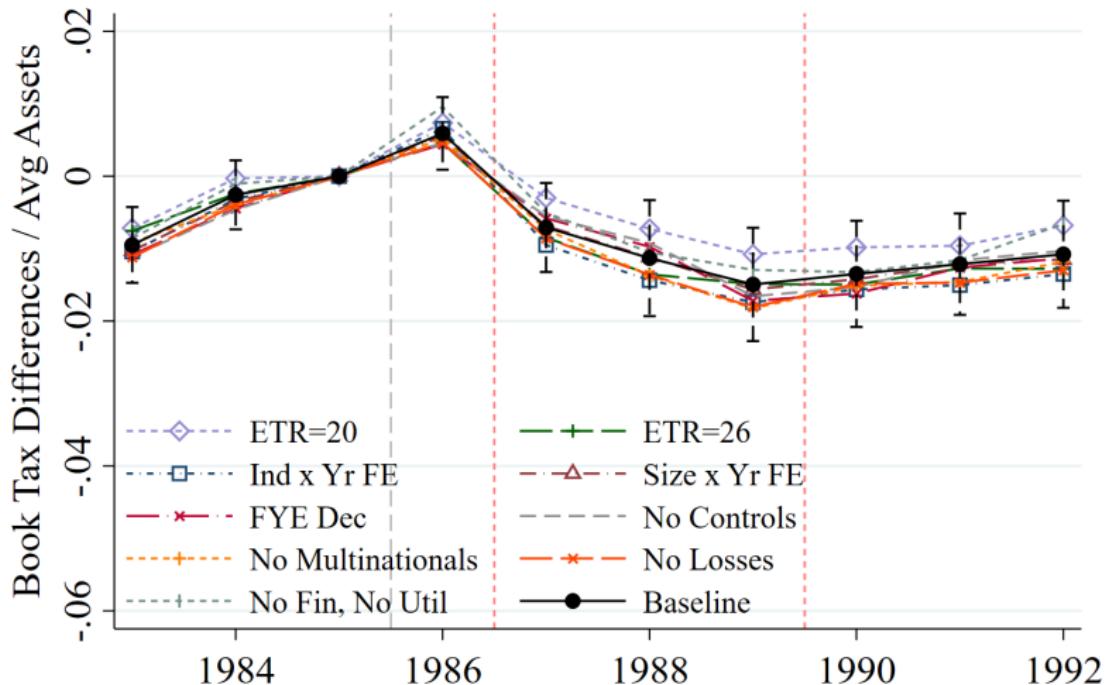


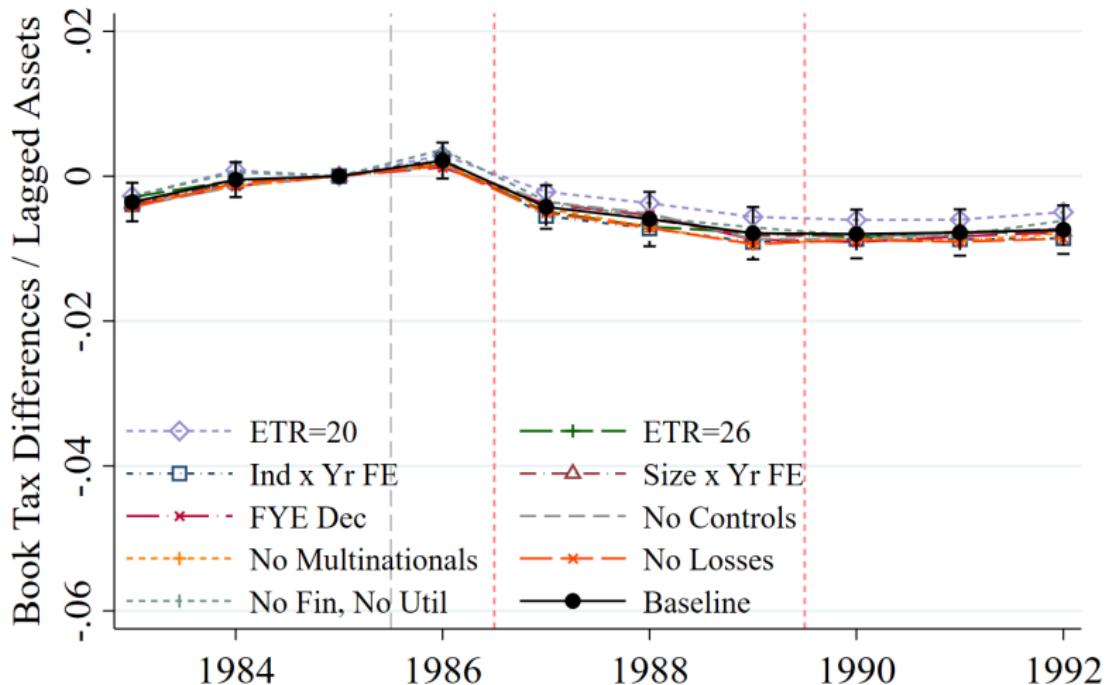


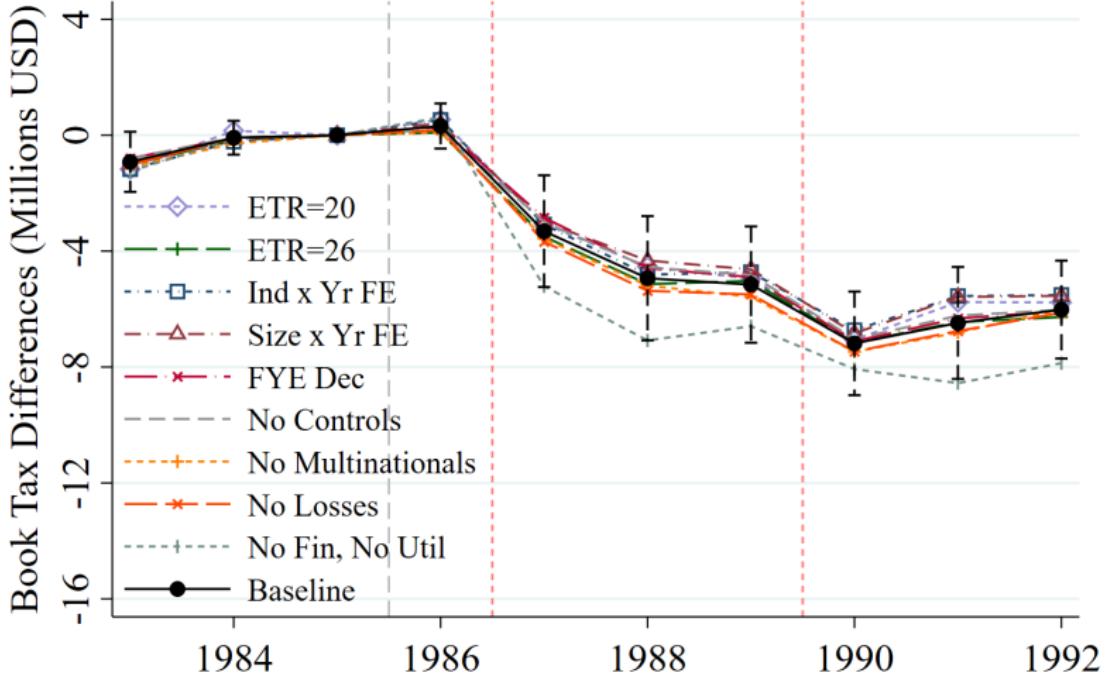


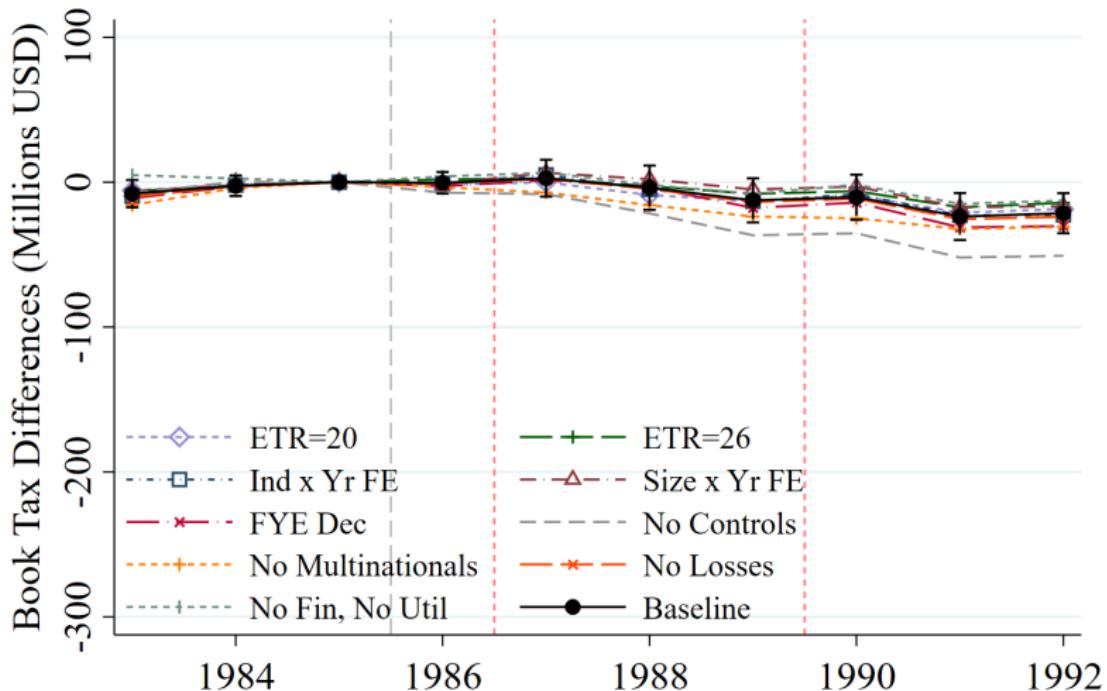


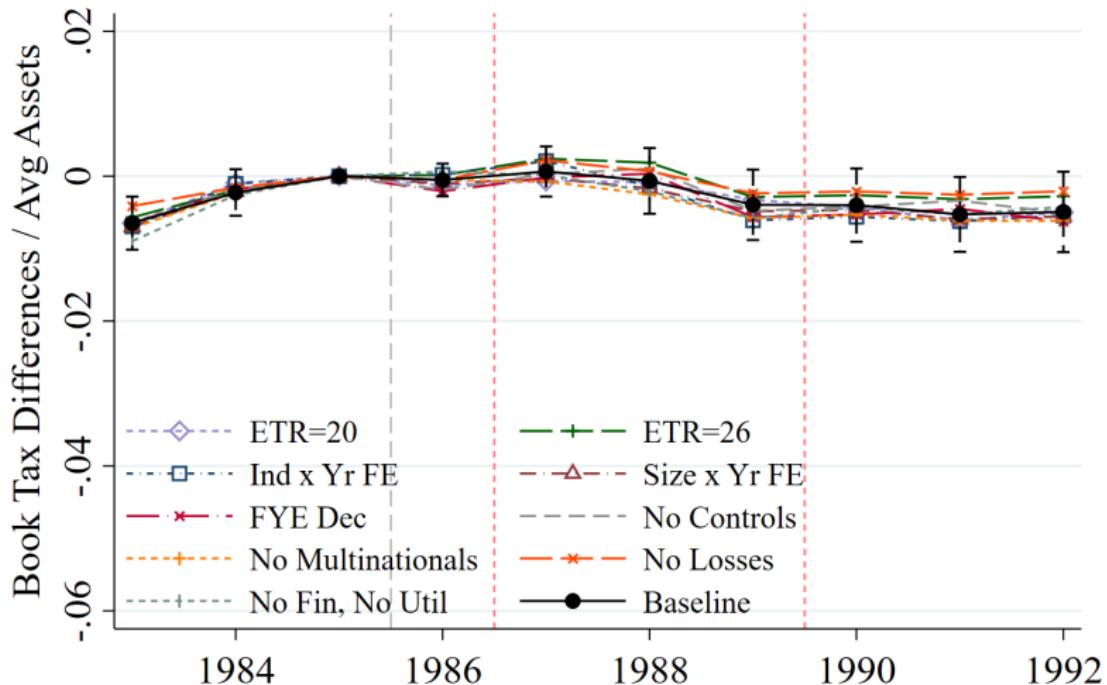


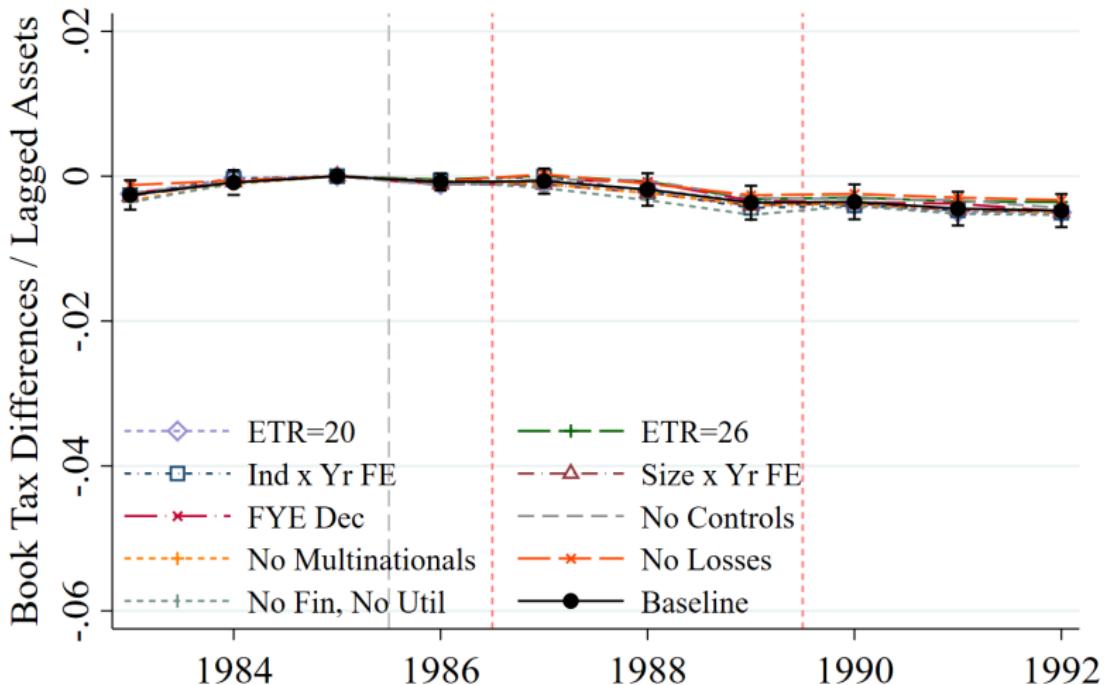


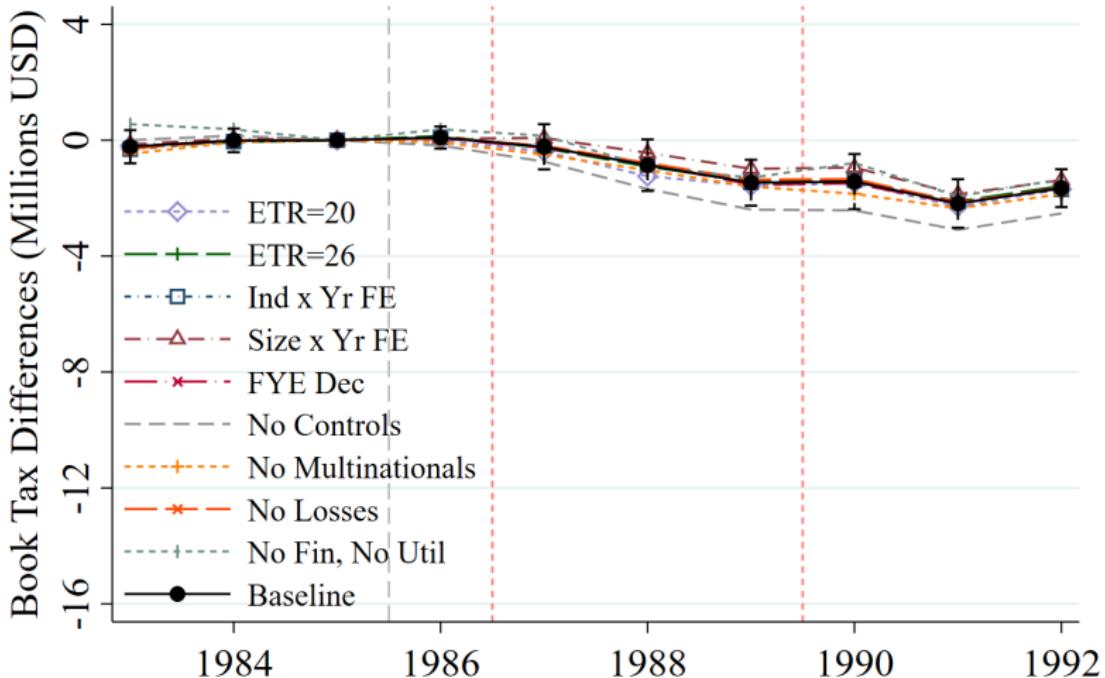




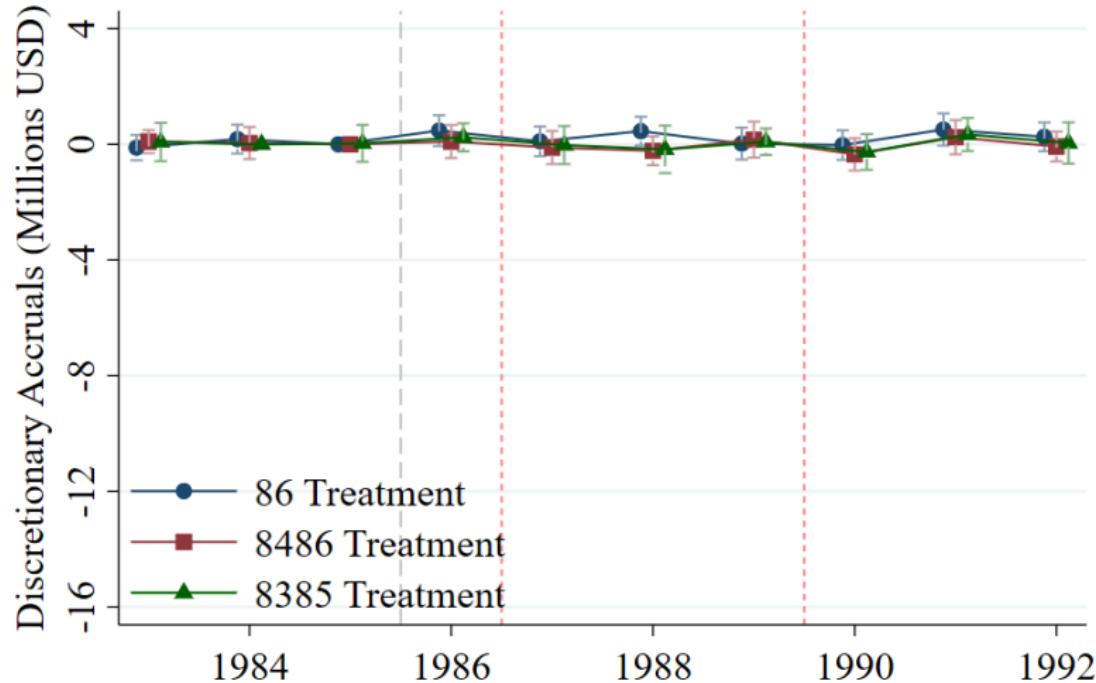




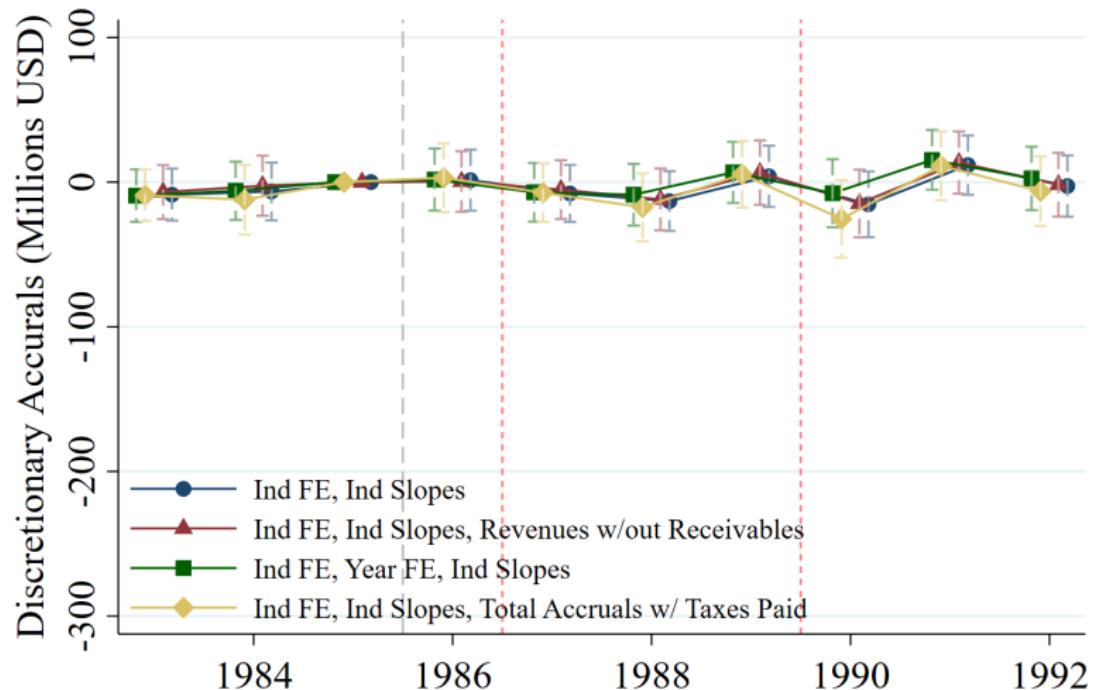




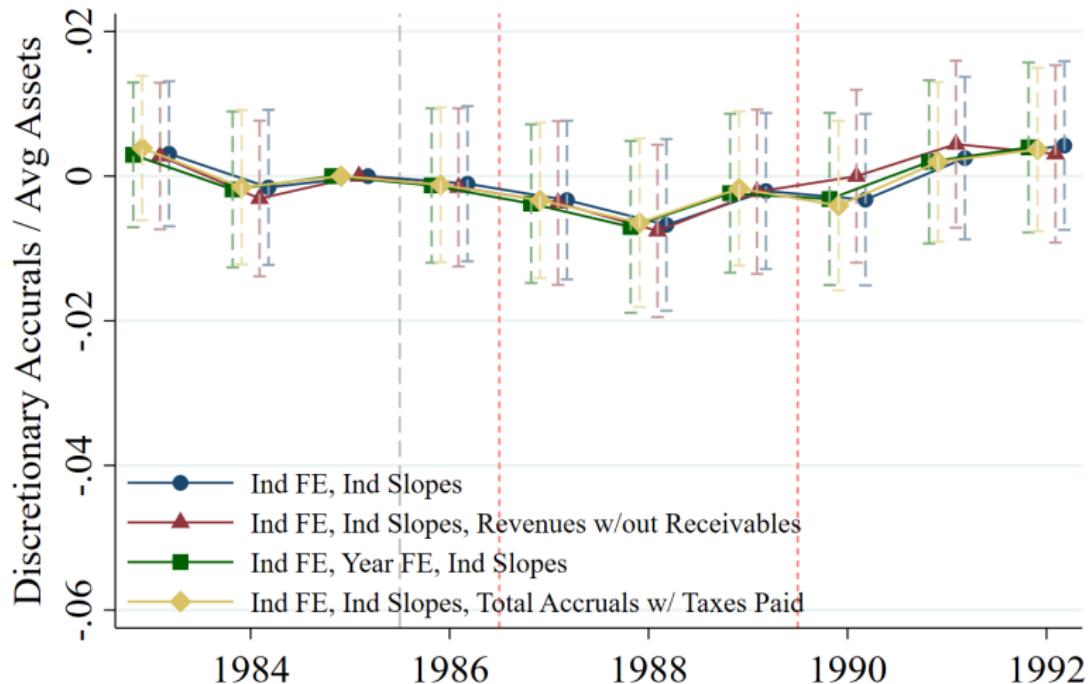
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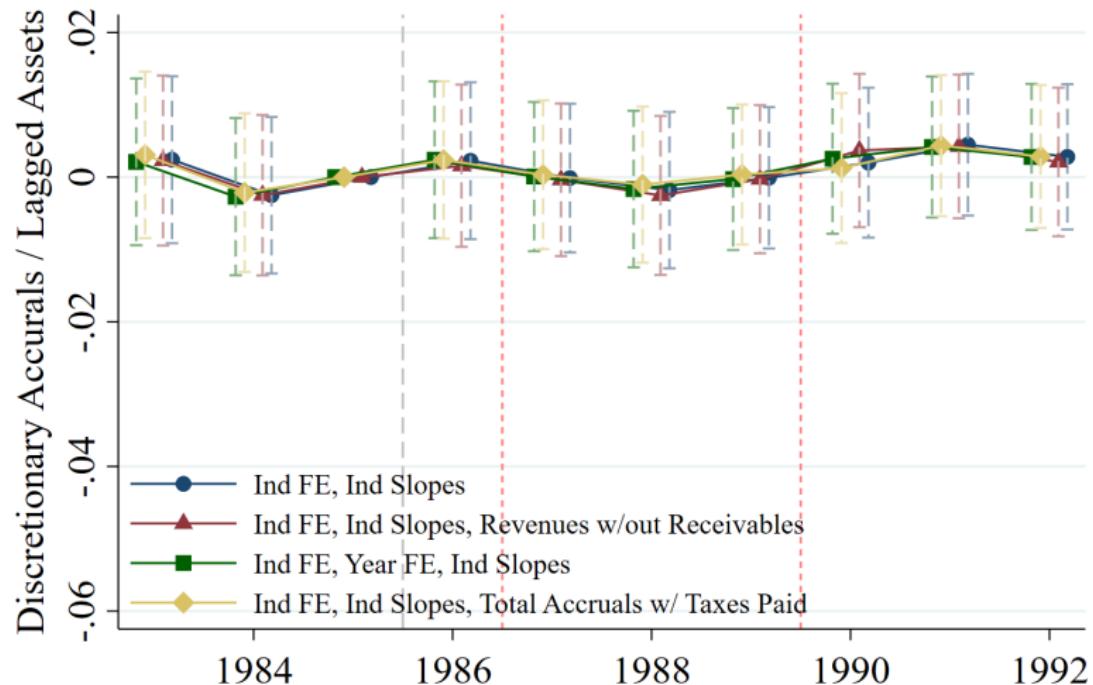
Discretionary Accruals Alternative Definitions



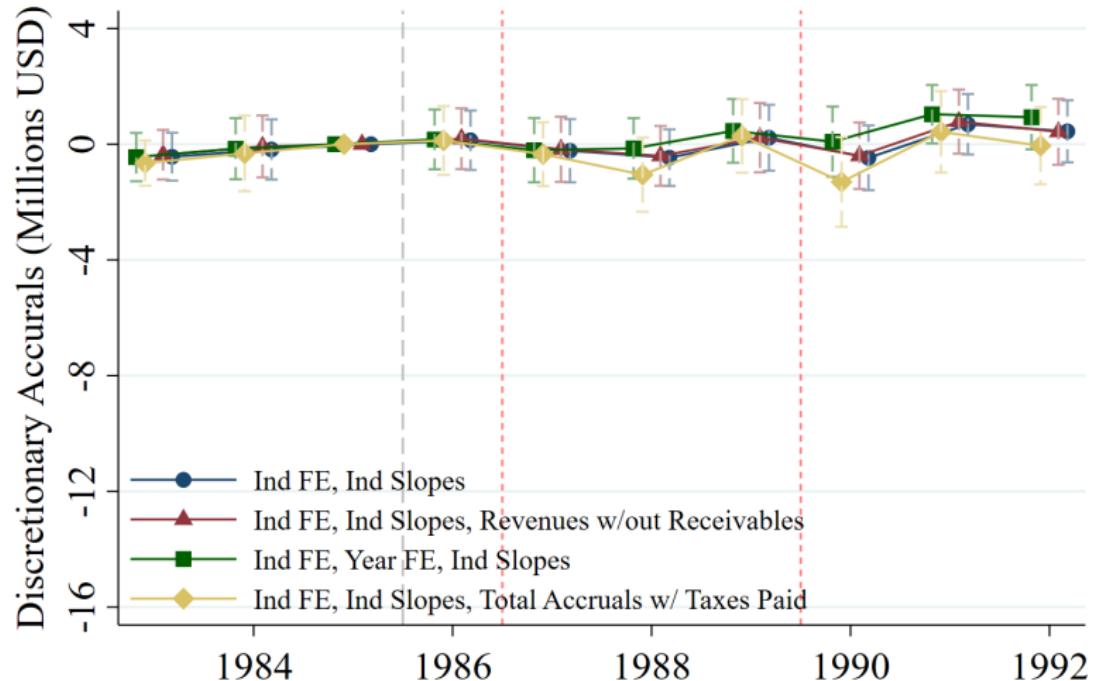
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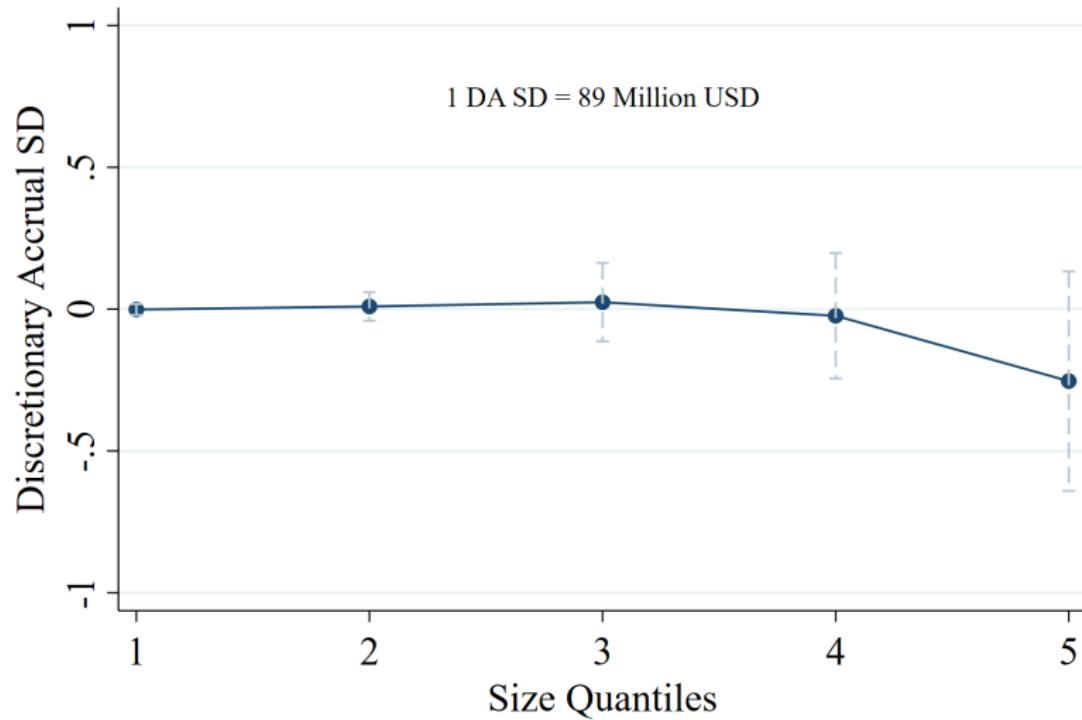
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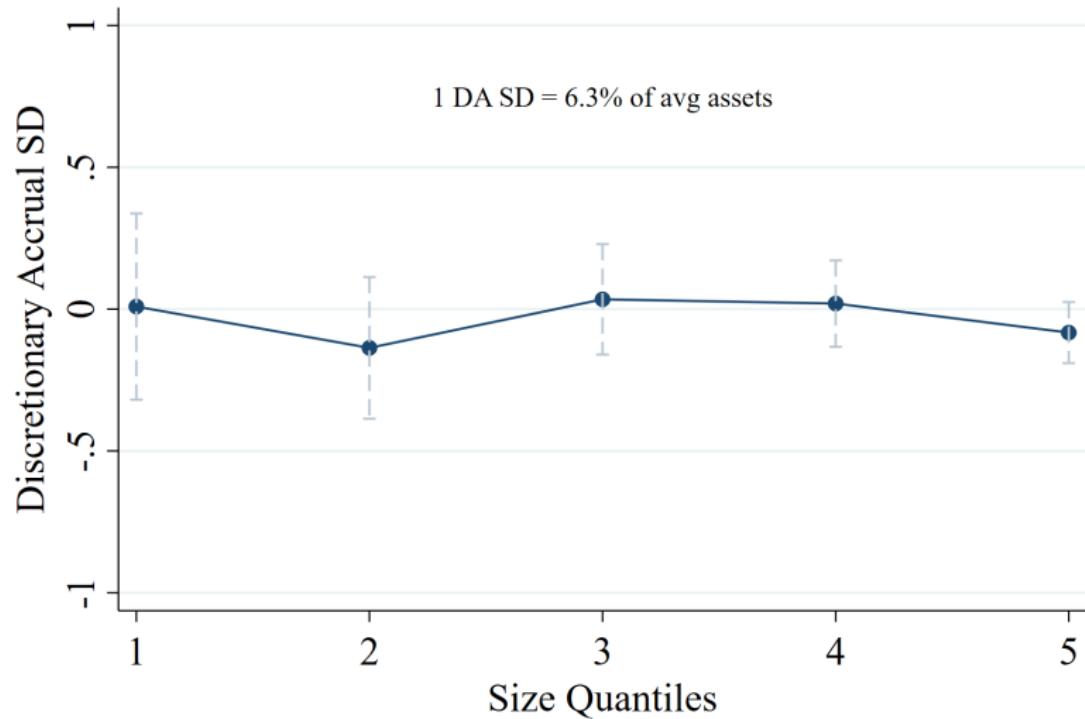
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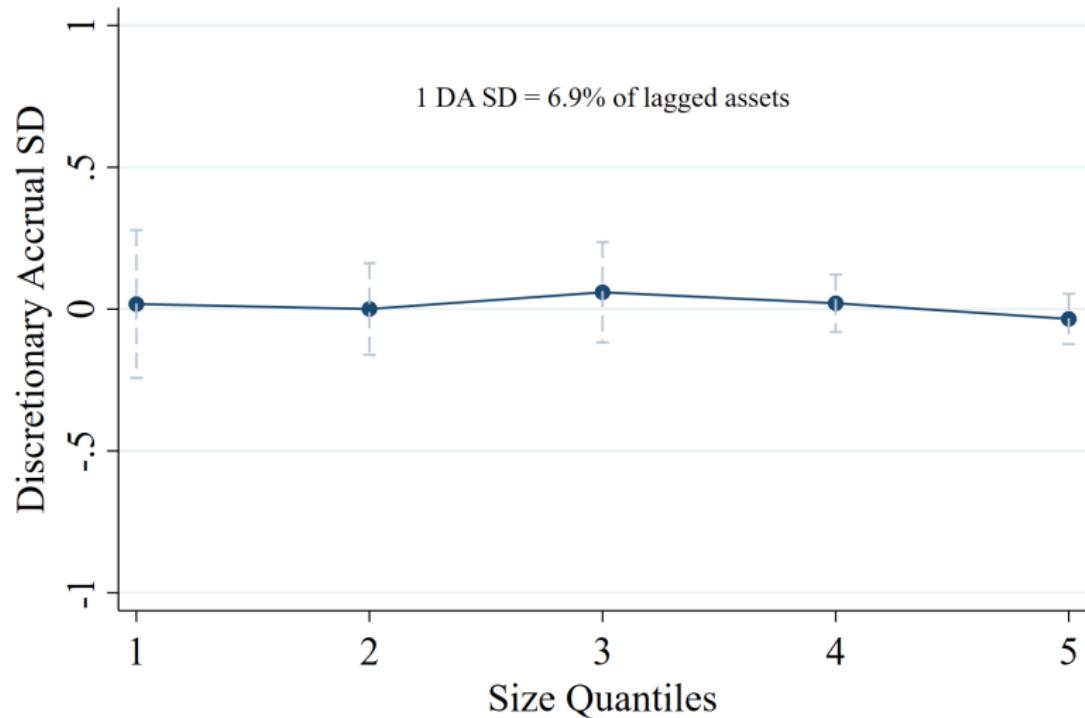
Earnings Management Heterogeneity by Firm Size



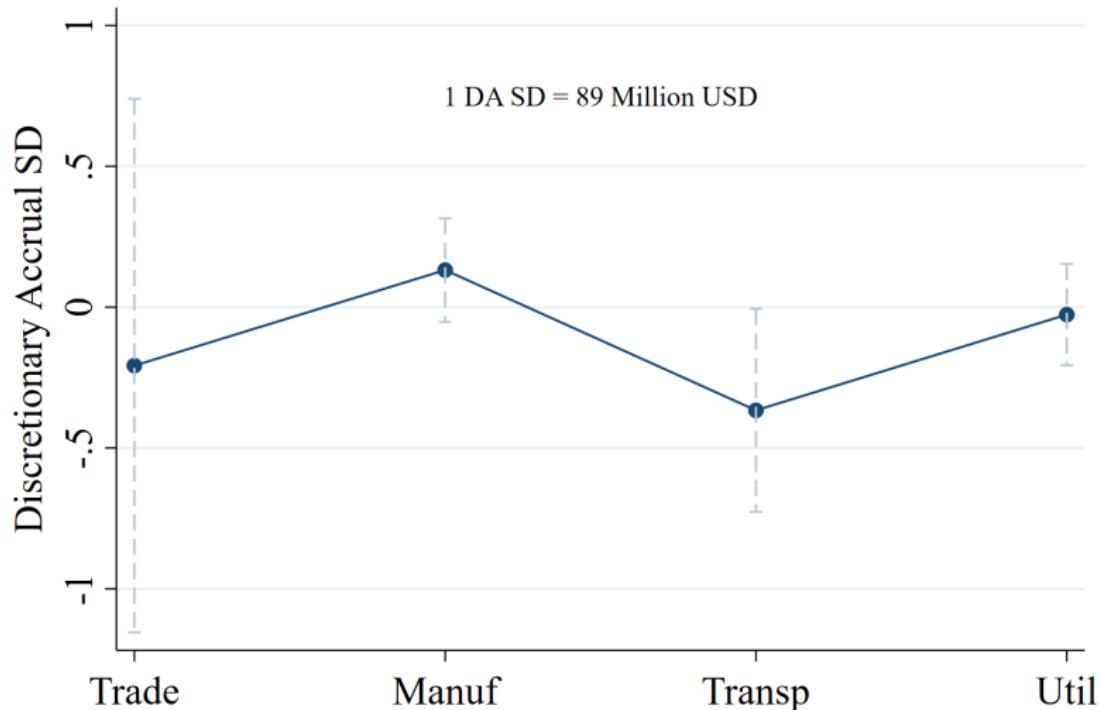
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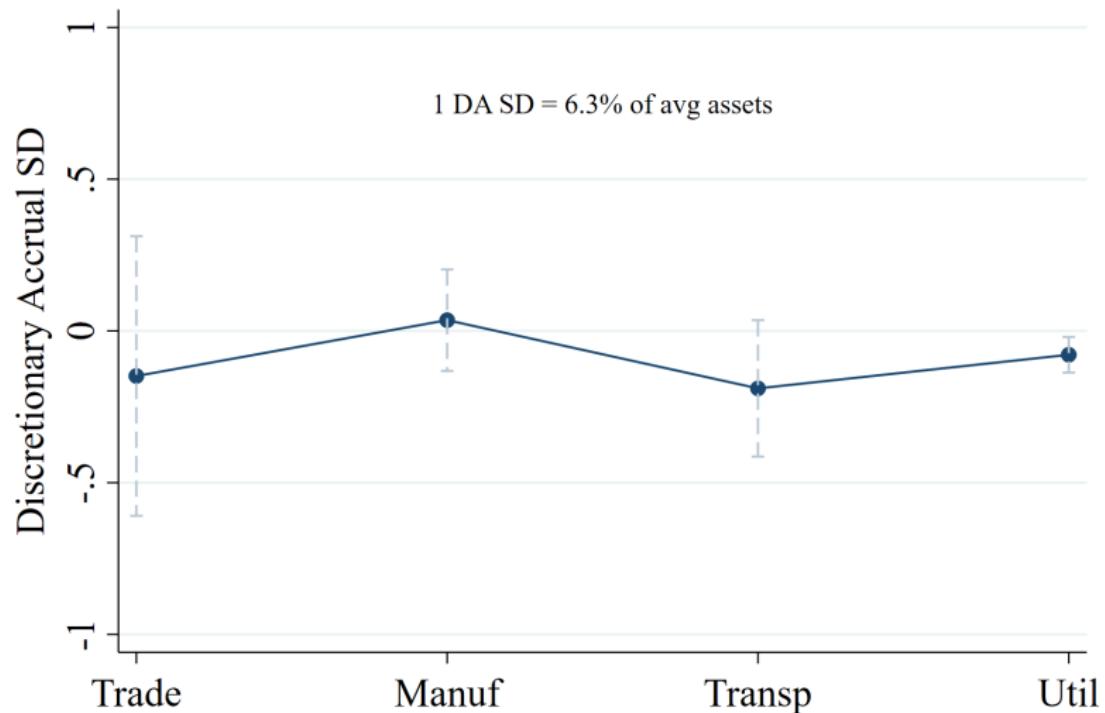
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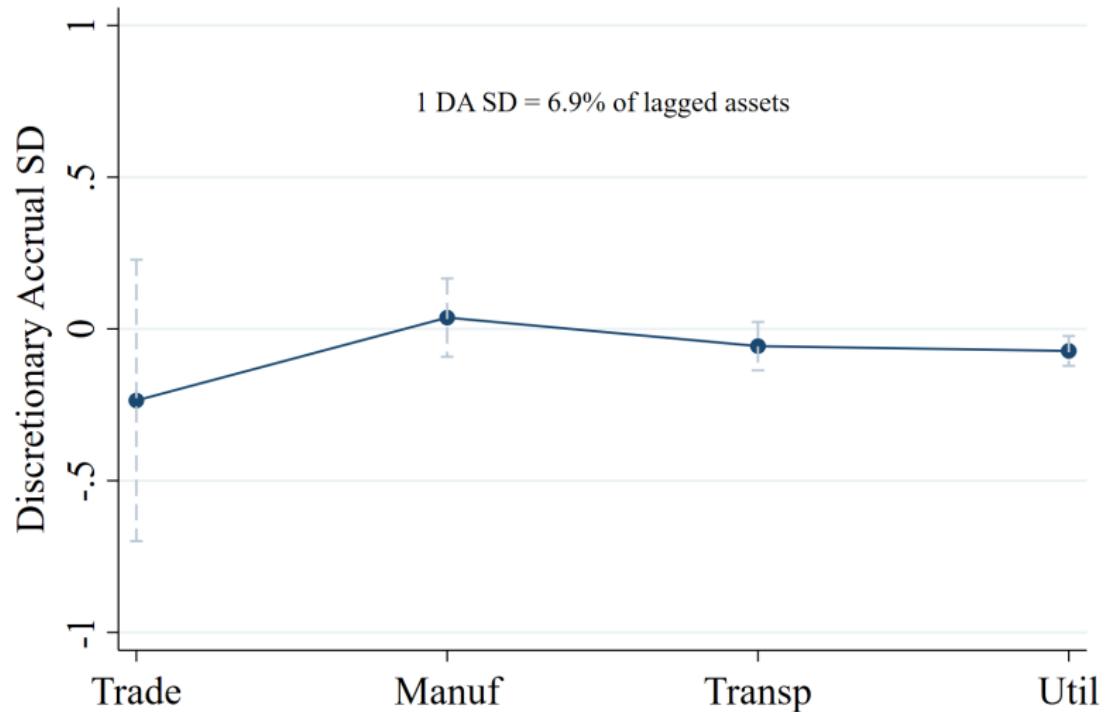
Earnings Management Heterogeneity by Industry



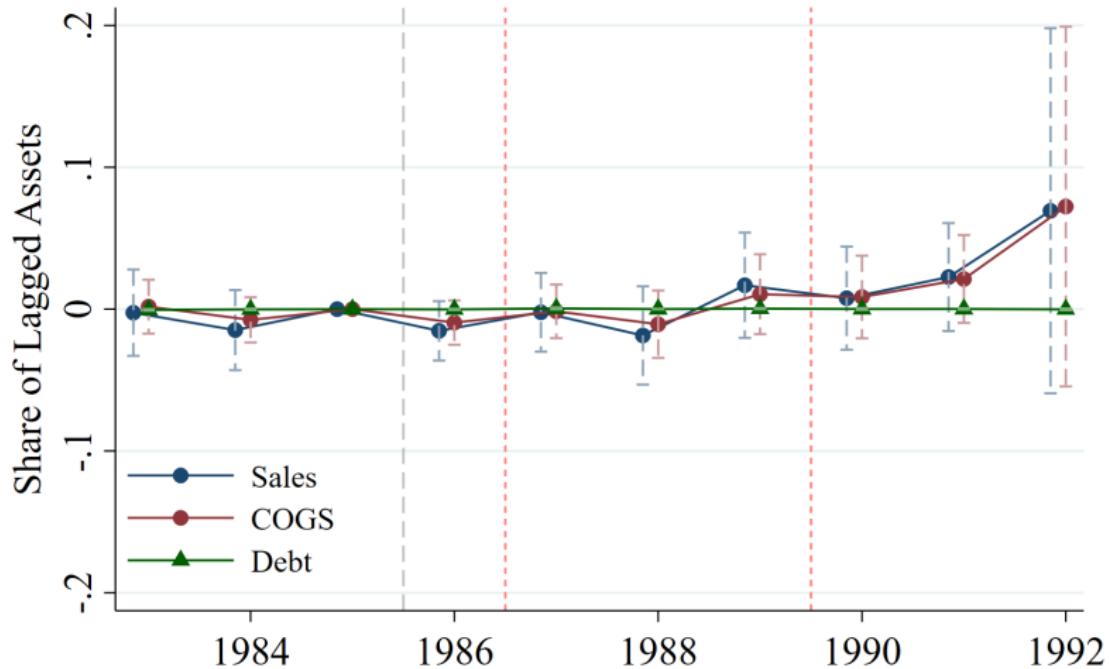
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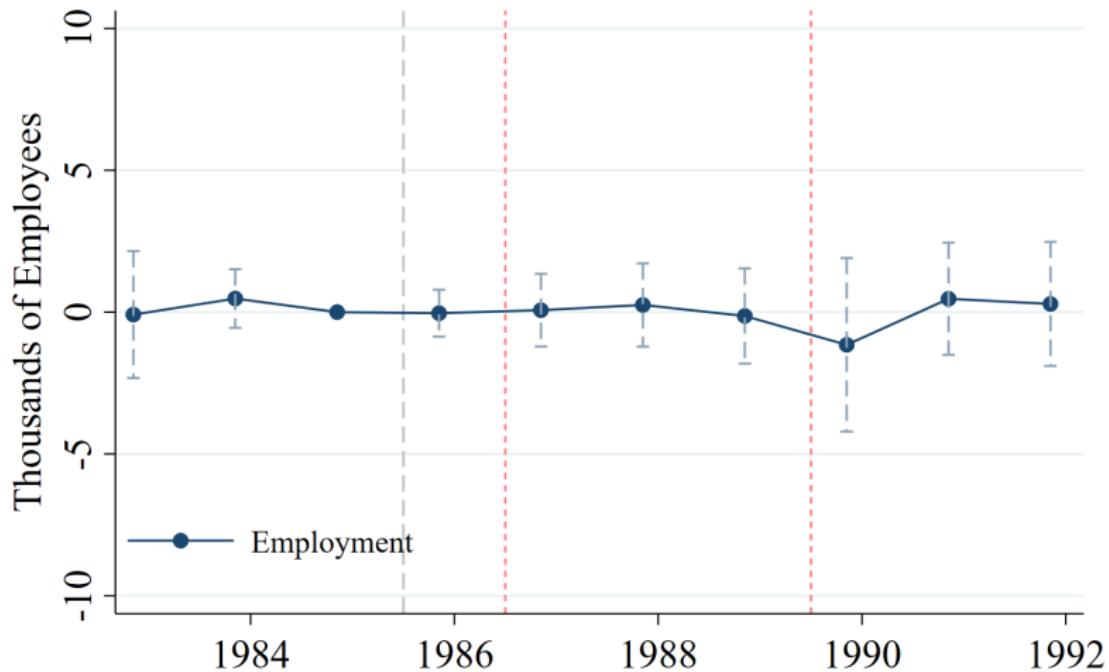
Earnings Management Heterogeneity by Industry



AMTBIA87 Real Outcome Responses



AMTBIA87 Employment Responses



AMTBIA87 IV Estimates

Table 1: Production and Investment Instrumental Variable Estimates

Coefficient	(1) Tax Revenue	(2) Sales	(3) COGS	(4) Investment	(5) Debt
Predicted Liability Effect	1.33 (0.45)	20.12 (9.01)	7.88 (5.03)	0.00 (0.00)	0.00 (0.00)
First Stage Coefficient	3.00 (1.12)	3.00 (1.12)	3.00 (1.12)	3.00 (1.12)	3.00 (1.12)
Observations	5718	5718	5718	5671	5718
Clusters	953	953	953	947	953

Scoring the Proposed Biden Book Income AMT

- Use 2018 cross section of Compustat firms present in 2017 and 2018, project income and tax variables over 10 year period using CBO GDP forecasts, incorporate behavioral response estimates into book income projections
- Revenue Scores depend on choice of ε_t

$$BI_t = BI_t^{mech} + \varepsilon_t \cdot BI_t^{mech} \cdot \frac{\Delta(1 - \tau)}{1 - \tau} \cdot \mathbb{1}(T = 1)$$

SOI Compustat Aggregates Comparison

