ONLINE APPENDIX

Corporate Tax Breaks and Executive Compensation

Eric Ohrn

This online appendix includes several sections of supplemental information.

Appendix A presents an example showing how bonus depreciation affects the after-tax present value cost of investments with varying MACRS tax lives.

Appendix B shows that bonus depreciation does not affect investment type.

Appendix C contains definitions for all the variables used in the paper and additional descriptive statistics.

Appendix D shows how the generosity of the tax breaks vary across NAICS major sectors.

Appendix E presents estimates after Compustat Segments data was used to refine definitions of BONUS and DPAD to account for multinational and multi-industry business activity.

Appendix F shows the effect of the tax breaks on executive compensation using alternative fixed effects and identification strategies.

Appendix G shows how the tax breaks affect firm-level business activities.

Appendix H presents dynamic DPAD estimates where tax loss status is allowed to vary annually.

Appendix I presents separate plots for each of the overlaid series in Figure 5.

Appendix J shows that the tax break estimates are stable when the tax break variables are winsorized at increasingly aggressive levels.

Appendix K describes how the Bebchuk Governance variable is constructed.

Appendix L shows the tax breaks do not affect measures of corporate governance.

Appendix M shows that the tax breaks do not lead to better ROA or stock return gains at better governed firms that increased pay more in response to the tax breaks.

Appendix A Effect of Bonus on PV Cost of Investment

Table A1 provides examples of the effect of 50% bonus depreciation on the present value after-tax cost of two assets, one with a 7-year MACRS life, the other with a 3-year MACRS life. In both examples we assume a firm makes a $100,000 investment and that the firm faces a statutory effective income tax rate of 35% (as was the case in the US during the sample period).

Panel (a) illustrates the 7-year asset example. In the absence of bonus depreciation, MACRS specifies that $25,000 of the total investment may be deducted in the first year, then $21,430 in the second, etc. With a federal tax rate of 35%, this leads to tax savings of $8,750 in the first year, then $7,500 in the second. Over the course of the 7 year life, all $100,000 of the investment cost are deducted from taxable income, generating $35,000 in total *nominal* tax shields. However, because the entire cost is not deducted from taxable income in the first year, the present value of tax savings associated with the investment are only worth $28,790.[1] The present value cost of the investment is the initial $100,000 minus the present value of the tax shield, $28,790, which is equal to $71,210.

Bonus depreciation allows for an additional percentage of the total cost to be deducted in the first year. In the example, 50% percent bonus depreciation allows $50,000 more to be deducted in the first year the investment is made. The remaining $50,000 of the cost is then deducted according to the original 7 year MACRS schedule. With 50% bonus there are now tax savings associated with the investment of $21,880 in the first year, $3,750 in the second year, etc. Thus, bonus depreciation accelerates the deduction of the investment and its associated tax savings. Because firms benefit from the tax savings earlier, the present value of the investment's tax shield increases to $31,890 and the present value cost of the investment decreases by 3.1 percentage points, from $71,210 to $68,110.

Panel (b) displays an identical exercise, but assumes the asset is deducted according to the 3-year MACRS schedule. The after-tax present value cost of the $100,000 investment is now $66,790 in the absence of bonus depreciation. The present value cost of the 3-year asset is lower than the present value cost of the 7-year asset because all $100,000 of the purchase price are deducted more quickly resulting in a larger present value tax shield and a lower present value cost of investment.

50% bonus depreciation decreases the present value cost of the 3-year asset from $66,790 to $65,900, or by 0.89 percentage points. Bonus depreciation has a smaller percentage point (and percent) impact on the after-tax present value cost of the 3-year asset than on the after-tax present value cost of the 7-year asset. This is because in the case of the 7-year assets, bonus depreciation accelerated deductions from further in the future, thereby increasing the present value of the deductions by more.

The comparison between the effects of bonus depreciation on the 7-year asset versus the 3-year

[1] The $28,790 is a function of the assumed discount rate of 10%. At higher discount rates, the present value of the tax shield will be lower.

asset perfectly illustrates the identification strategy used in this paper; bonus depreciation has a larger effect on the present value cost of investments for firms that invest in longer-lived assets, on average.

Table A1: Example of Effect of Bonus Depreciation on Present Value Cost of Investment

(a) Effect of 50% Bonus Depreciation on 7-year Asset Class Investment

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
Present Value (τ_f x Deduction)									28.79
Present Value Cost of Investment									71.21
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
Present Value (τ_f x Deduction)									31.89
Present Value Cost of Investment									68.11

(b) Effect of 50% Bonus Depreciation on 3-year Asset Class Investment

Year	1	2	3	4	5	6	7	8	Total
MACRS Deduction	58.33	27.78	12.35	1.54	0	0	0	0	100
τ_f x Deduction	20.42	9.72	4.32	0.51	0	0	0	0	35
Present Value (τ_f x Deduction)									33.21
Present Value Cost of Investment									66.79
50% Bonus Ded.	79.165	13.89	6.175	0.725	0	0	0	0	100
τ_f x Deduction	27.71	4.86	2.68	2.16	0.25	0	0	0	35
Present Value (τ_f x Deduction)									34.10
Present Value Cost of Investment									65.90

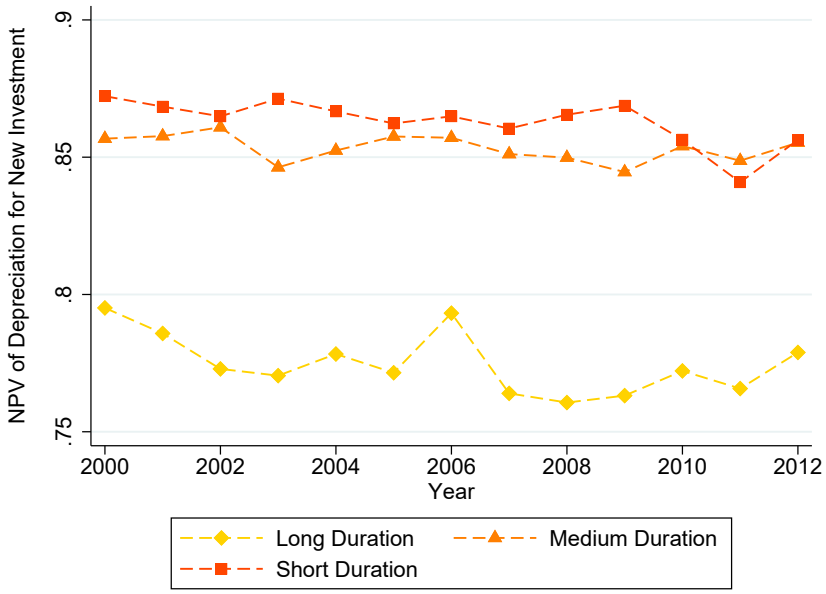
Notes: Table A1 shows the effects of 50% bonus depreciation on the present value of tax deductions associated with two $100,000 investments. In Panel (a), the investment is made is an asset with a 7-year MACRS life. In Panel (b), the investment is made in an asset with a 3-year MACRS life. The federal corporate tax rate in both panels is assumed to be 35%. The discount rate in both panels is assumed to be 10%. All numbers are in thousands of dollars. *Source*: Authors calculations.

Appendix B Stability of Sector-Level Investment Types Over Time

In this appendix, I show the stability of sector-level z_0 measures during the period 2000–2012. To do so, I start with sector-level Form 4562 data from the IRS's Statistics of Income division. The aggregated, sector-level data details investment levels for each possible MACRS asset-life (3-year, 5-year etc.). Using the percentages of investment in each category and MACRS depreciation schedules and assuming a 10% discount rate, I calculate sector-level measures of z_0, the present value of tax depreciation on a dollar of investments. I then sort sectors into terciles according to their 2000 z_0 values. Figure A1 plots z_0 during the years 2000–2012 for each tercile. Overall, Figure A1 shows z_0 is fairly stable across sectors. The implication is that firms are not significantly altering their mix of investments across MACRS asset classes in response to the policy.

The stability of investment patterns across MACRS categories is likely due to the fact that most MACRS categories are defined by asset "use" rather than asset "type." For example, assets used for wholesale trade are depreciated over a five year period while assets used for textile manufacturing are depreciated over a seven year period. As a result, the same asset used in different industries is depreciated over different horizons. This means firms are less able to re-optimize the types of investments they make to take advantage of bonus depreciation.

Figure A1: Stability of Sector-Level z_0 Measure Over Time



Notes: Figure A1 presents average z_0 measures across sectors for three groups of sectors sorted according to their 2000 z_0. Sector-level z_0 measures are constructed from IRS Statistics of Income sector-level aggregate Form 4562 data which details the percent of investment in each MACRS asset-life category. *Source*: IRS Statistics of Income.

Appendix C Variable Definitions and Additional Descriptive Stats

Table A2: Variable Definitions and Sources

Variable Name	**Description**
BONUS	Percentage point reduction in the present value of investment prices due to bonus depreciation. *Source:* Author's calculations based on Zwick and Mahon (2017) data and bonus depreciation rates defined in IRS Publication 946.
DPAD	Percentage point reduction in effective corporate income tax rates generated by the DPAD. *Source:* Author's calculations based on IRS Statistics of Income and Compustat data.
Ln(Comp)	Log of the total compensation awarded to an executive in a year. *Source:* Execucomp.
Ln(Experience)	Log of the number of years an executive is present in the Execucomp data prior to the current year.
Female	An indicator equal to one if the executive identifies as female.*Source:* Execucomp.
ETI	Percentage point reduction in effective corporate income tax rates due to the Extraterritorial Income Exclusion. *Source:* Author's calculations based on USA Trade Online data.
Firm Size Bins	Decile bins based on the log of total assets in 2001. *Source:* Author's calculations based on Compustat data.
ROA Bins	Decile bins based on average net income divided by total assets during the years 1997–2001. *Source:* Author's calculations based on Compustat data.
R&D Bins	Decile bins based on the log of R&D expenses during the years 1997–2001. *Source:* Author's calculations based on Compustat data.
Ind Comp Growth Bins	Decile bins based on the percentage change in average total compensation awarded at the NAICS 3-digit level from 1998–2001.*Source:* Author's calculations based on Execucomp and Compustat data.
Option Usage Bins	Decile bins based on the firm-level ratio of the value of options awarded to total compensation awarded in 2004. *Source:* Author's calculations based on Execucomp and Compustat data.

Continued on next page

Table A2 – *Continued from previous page*

Variable	**Description**
Recession Bins	Decile bins based on industry-level percent increase in sales from 2006–2009. *Source:* Author's calculations based on Execucomp and Compustat data.
Domestic Firms	An indicator equal to one for firms that report no pretax foreign income in years 1998–2012. *Source:* Author's calculations based on Compustat data.
BONUS Placebo	The percentage point reduction in present value investment prices in a year due to bonus depreciation multiplied by an indicator equal to one for NAICS codes 2111, 4821, 5311, 7111, 7112, 7211, 7212, and 8100–8199. *Source:* Author's calculations based *Source:* Author's calculations based on Zwick and Mahon (2017) and IRS Publication 946.
DPAD Placebo	Percentage point reduction in effective corporate income tax rates due to the DPAD. Coded as nonmissing only for firms in non taxable status in the majority of years after the DPAD was implemented. *Source:* Author's calculations based on IRS Statistics of Income and Compustat data.
Return on Assets (ROA)	Income before extraordinary items divided by total assets. *Source:* Author's calculations based on Compustat data.
Earnings per Share (EPS)	Net income divided by common shares outstanding. *Source:* Author's calculations based on Compustat data.
Sales	A firm's total revenue. *Source:* Author's calculations based on Compustat data.
Operating Income (OI)	A firm's operating income. *Source:* Author's calculations based on Compustat data.
Relative Sales Growth	The different between a firm's annual growth in sales and their NAICS 4-digit industry's annual growth in sales. This variable is normalized to standard deviation units. *Source:* Author's calculations based on Compustat data.
New Hire	An indicator equal to one in the first year an executive is paired with a given firm in the Execucomp database. *Source:* Author's calculation based on Execucomp data.

Continued on next page

Table A2 – *Continued from previous page*

Variable	**Description**
𝟙(Insider Hires %)	An indicator equal to one/zero for firms in the top/bottom half of the distribution of industry-level percentage of new CEO hires made from within the firm during the period 1993–2005. *Source:* Calculations by Cremers and Grinstein (2014) using Execucomp data.
CEO	An indicator equal to one if the executive is designated as a firm's CEO. *Source:* Execucomp.
Industry Average Market Cap	Log of NAICS 4-digit industry-level market cap in a year. *Source:* Author's calculations based on Compustat data.
𝟙(Bebchuk Governance)	An indicator equal to one/zero when a firm is in the top/bottom tercile of Bebchuk Governance following Bebchuk, Cohen and Ferrell (2009). Appendix K describes how the Bebchuk Governance variable is constructed. *Source:* Author's calculations based on Riskmetrics data.
𝟙(Large Holder)	An indicator equal to one/zero when a firm is in the top/bottom tercile of the distribution of the percentage of shares held by the single largest institutional investor in a year. *Source:* Author's calculations based on Thomson Reuters 13f data.
𝟙(Executive Tenure)	An indicator equal to one/zero when a firm is in the top/bottom tercile of average years executives have been working at their current firm. *Source:* Author's calculation based on Riskmetrics, Thomson Reuters 13f, and Execucomp data.
𝟙(Combined Governance)	An indicator equal to one when any two or more of 𝟙(Bebchuk Governance), 𝟙(Large Holder), or 𝟙(Executive Tenure) are equal to one and zero otherwise. Author's calculations based on Riskmetrics data
Ln(Current)	Log of the sum of salary and bonus paid to an executive in a year. Author's calculation based on Execucomp data.
Ln(NonCurr)	Log of the sum of all non salary and non bonus compensation paid to an executive in a year. Author's calculation based on Execucomp data.
Current/Total	The sum of salary and bonus paid to an executive in a year divided by total compensation awarded to an executive in a year. Author's calculation based on Execucomp data.
Ln(CX)	Log of capital expenditures in a year. *Source:* Author's calculations based on Compustat data.

Continued on next page

Table A2 – *Continued from previous page*

Variable	**Description**
Debt Ratio	Total liabilities divided by total assets in a year. *Source:* Author's calculations based on Compustat data.
Payouts / l.SL	Dividends plus share repurchases divided by lagged sales in a year. Share repurchases are defined as non-negative increases in treasury stock. *Source:* Author's calculations based on Compustat data.
Ln(Assets)	Log of total assets in a year. *Source:* Author's calculations based on Compustat data.
Stock Return	Dividends paid plus stock price growth divided by last year's year end stock price. *Source:* Author's calculations based on Compustat data.
Ln R&D	Log of R&D expenses in a year. *Source:* Author's calculations based on Compustat data.
US Fed Tax	US Federal taxes paid divided by total assets in a year. *Source:* Author's calculations based on Compustat data.
CX	Capital expenditure divided by total assets in a year. *Source:* Author's calculations based on Compustat data.
PI	Pretax income divided by total assets in a year. *Source:* Author's calculations based on Compustat data.

Table A3: Additional Descriptive Statistics

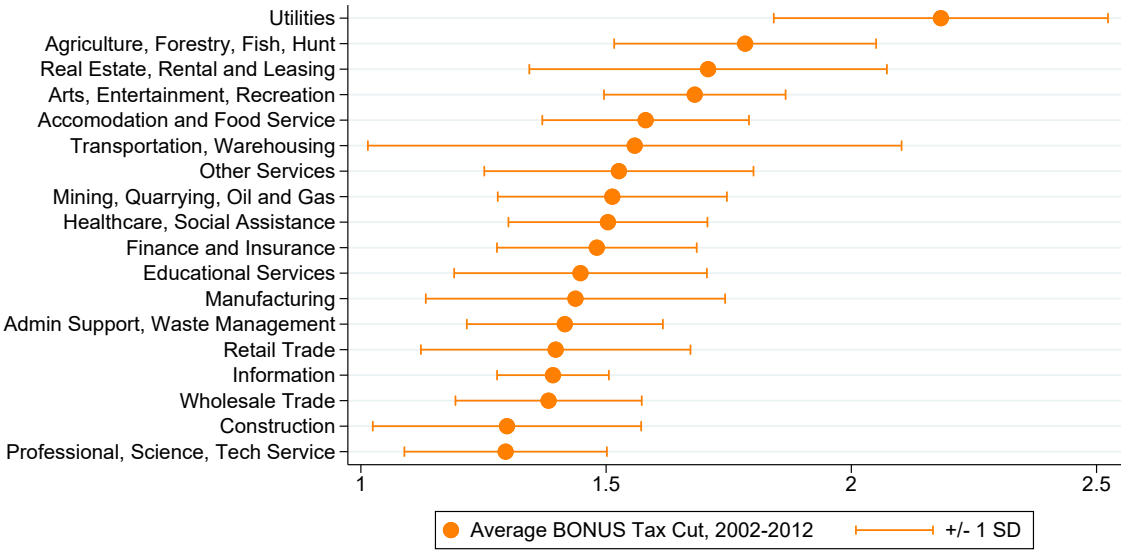
	Mean	Std. Dev.	25th Percentile	75th Percentile	Obs.
More Controls					
Ind Comp Growth	0.405	0.450	0.120	0.714	100,520
Options Usage	0.273	0.216	0.091	0.428	96,620
Recession	0.100	0.265	-0.034	0.267	100,323
Placebos					
BONUS Placebo	0.389	2.778	0.000	0.000	100,520
DPAD Placebo	0.323	0.632	0.000	0.360	35,461
Governance Variables					
Bebchuk Governance	3.586	1.434	3.000	5.000	74,961
Largest Instit. Holder %	0.094	0.182	0.064	0.114	81,819
Executive Tenure	8.761	4.994	5.000	12.000	100,520
Performance Metrics					
Earnings per Share (EPS)	1.367	8.076	0.285	2.267	97,950
Sales	6628.898	19818.032	608.875	4991.989	98,236
Operating Income	774.347	3284.365	33.581	466.176	96,414
Relative Sales Growth	-0.008	0.028	-0.009	-0.006	96,489
Stock Return	0.242	1.391	-0.142	0.231	99,244
Market Measures					
Insider Hires %	0.693	0.113	0.610	0.770	99,613
Ind. Avg. Market Cap	2871.799	3450.877	982.562	3434.480	100,515
Other Variables					
Current/Total	0.456	0.265	0.241	0.635	100,520

Notes: Table A3 presents additional descriptive statistics for the analysis sample. Ind Comp Growth is the percentage change in average total compensation awarded at the NAICS 4-digit level from 1998–2001. Option Usage is the firm-level ratio of the value of options awarded to total compensation awarded in 2004. Recession Bins is the industry-level percent increase in sales from 2006–2009. BONUS Placebo is the percentage point reduction in present value investment prices in a year due to bonus depreciation multiplied by an indicator equal to one for NAICS codes 2111, 4821, 5311, 7111, 7112, 7211, 7212, and 8100–8199. DPAD Placebo is the percentage point reduction in effective corporate income tax rates due to the DPAD for firms with persistent losses. Bebhuk Governance is a governance measure ranging from 0 to 6 based on the Bebchuk, Cohen and Ferrell (2009) Entrenchment Index. Largest Instit. Holder % is the percentage of outstanding shares held by the largest single institutional shareholder. Executive Tenure is the total number of years each executive works at given firm. Earning per share is net income divided by common shares outstanding. Sales is a firm's total revenue. Operating Income is a firm's operating income. Stock Return is the change in stock price plus dividends as a percentage of last year's ending stock price. Insider Hires % is the percentage of executive new hires made from within the firm, measured at the 4-digit NAICS level. Ind. Avg. Market Cap is the 4-digit NAICS industry average market cap. Current/Total is the percentage of awarded compensation composed of salary and bonus. *Sources*: Execucomp, Compustat, Thomson Reuters, Risk Metrics, IRS Statistics of Income, and Zwick and Mahon (2017).

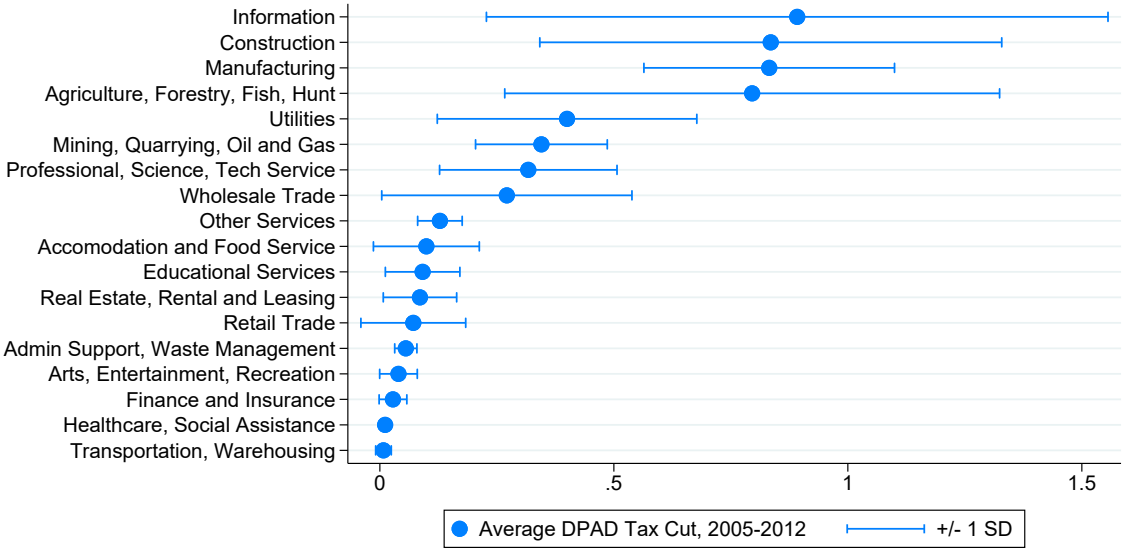
Appendix D Sector-Level Cross-sectional Variation in the Tax Breaks

Figure A2: Tax Break Variation Across Major Sector

(a) BONUS by NAICS Sectors



(b) DPAD by NAICS Sectors



Notes: Figure displays the average effective tax break and +/− 1 standard deviation unit for firms across NAICS sectors. Panel (a) focuses of BONUS. Panel (b) focuses on DPAD. *Source*: Authors calculations based on Compustat, Execucomp, IRS Statistics of Income, and Zwick and Mahon (2017) data.

Appendix E Using Segments Data to Refine BONUS, DPAD

E.1 Assigning BONUS and DPAD by Industry Segments

Both the tax break variables are assigned to an executive based on their firm's primary industry. Large publicly traded firms may operate in many different industries. Therefore, assigning the tax breaks based only on primary industry codes may create some mismeasurement in the tax break variables. To address this concern, I use Compustat business segments data to calculate the percentage of a firm's total assets in each of its business segments for those firms reporting business segments data. I then aggregate according to each business segment's primary industry to find the percentage of assets in each NAICS industry. Then, I reassign each of the the tax breaks according to the distribution of assets across industries. I present results using these modified tax break variables in Specification (2) of Table A4. The effect of each tax break on executive compensation remains large, positive, and statistically significant. While both estimates are slightly smaller than the baseline effects (reproduced in Specification (1) of the same table), the differences are statistically insignificant at conventional levels. In sum, adjusting the tax breaks variables using the business segments data and assigning the tax break measures based on the percentage of assets in each segment's primary industry does not suggest there is significant measurement error in tax break variables due to the multiplicity of business activity across industries of large publicly traded firms.

E.2 Assigning DPAD by US Asset Class

The DPAD tax break variable is assigned to an executive based on their firm's primary industry and asset class where asset class is assigned by total worldwide assets. Large publicly traded firms may operate in many different countries and hold only a fraction of their total worldwide assets in the US. Therefore, assigning the DPAD tax break based on total worldwide assets may create some mismeasurement of the DPAD variable. To address this concern, I use Compustat geographic segments data to calculate the percentage of total assets held abroad for those firms reporting foreign segments data. I multiply this percentage by total worldwide assets to find each firm's total US assets and reassign the DPAD variable based on firm size bins based on this measure. I present results using this modified DPAD variable in Specification (3) of Table A4. The effect of the adjusted variable on executive compensation remains large, positive, and statistically significant. While the estimate is slightly smaller than the baseline DPAD estimate (reproduced in Specification (1) of the same table), the difference between the two effects is statistically insignificant at conventional levels. Adjusting the DPAD variable using the geographic segments data does not suggest there is significant measurement error in the DPAD variable due to the multinational nature of large publicly traded US firms.

As an additional check, Specification (4) presents baseline model results estimated using only

domestic firms (those reporting no pretax foreign income when the DPAD was available). For this much smaller subsample of executives, the tax breaks continue to have large and statistically significant effects on executive compensation, suggesting that measurement error due to the international activities of many of the large publicly traded firms in the sample does not lead to the large positive effects. These results also suggest that tax break effects are not due to industry-level export intensity, which Keller and Olney (2017) show is strongly correlated with executive compensation.

Table A4: Effect of Segments-Adjusted Tax Breaks on Executive Compensation

	(1) Ln(Comp)	(2) Ln(Comp)	(3) Ln(Comp)	(4) Ln(Comp)
Lagged BONUS	0.0619***		0.0621***	0.0590***
	(0.0110)		(0.0110)	(0.0146)
Lagged DPAD	0.0423***			0.0712**
	(0.0135)			(0.0294)
Lagged BONUS, Industry Segments		0.0593***		
		(0.0108)		
Lagged DPAD, Industry Segments		0.0363***		
		(0.0102)		
Lagged DPAD, Geographic Segments			0.0362***	
			(0.0102)	
Firm FE	✓	✓	✓	✓
Firm Size Bins x Year FE	✓	✓	✓	✓
Baseline Controls	✓	✓	✓	✓
Domestic Firms Only				✓
Observations	100,520	100,410	100,410	31,701

Notes: Table A4 shows how estimates of the effect of BONUS and DPAD differ from baseline estimates when Compustat geography and industry segments data are used to refine the tax break variables. All Specifications are based on Specification (4) from Table (2). Specification (1) reproduces the estimates from Specification (4) from Table (2). Specification (2) replaces both tax break variables with refined measures where the tax breaks are assigned to industries based on the percentage of total assets reported in each industry segment. Specification (3) replaces Lagged DPAD with a refined measure firm size bins are assigned according to total US assets. Specification (4) re-estimates the baseline model using only data for domestic firms (those reporting no pretax foreign income when the DPAD is available). Standard errors are presented in parentheses and are clustered at the four-digit NAICS industry level; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ *Sources*: Author's calculations based on Compustat, Execucomp, IRS Statistics of Income, and Zwick and Mahon (2017) data.

Appendix F Alternative Identification Strategies

Table A5: Effect of Tax Breaks on Executive Compensation; Alternative ID Strategies

	(1) Ln(Comp)	(2) Ln(Comp)	(3) Ln(Comp)	(4) Ln(Comp)
Lagged BONUS	0.0619***	0.0466***	0.0473***	
	(0.0110)	(0.0101)	(0.00906)	
Lagged DPAD	0.0423***	0.0310**	0.0302**	
	(0.0135)	(0.0156)	(0.0141)	
BONUS				0.0603***
				(0.0109)
DPAD				0.0525***
				(0.0126)
Firm FE	✓	✓		✓
Firm Size Bins x Year FE	✓	✓	✓	✓
Exec FE		✓		
Exec x Firm FE			✓	
Observations				
N	100,520	95,627	95,047	100,371

Notes: Table A5 explores how coefficient estimates of the effect of BONUS and DPAD differ when alternative identification strategies are used. All Specifications are based on Specification (4) from Table (2) and include controls for executive gender and experience as well as firm size bins interacted with year fixed effects. Specification (1) reproduces the estimates from Specification (4) from Table (2). Specification (2) includes executive fixed effects. Specification (3) includes executive-by-firm fixed effects instead of executive and firm fixed effects. Specification (4) replicates the Specification (1) strategy, but employs contemporaneous measures of BONUS and DPAD rather than lagged values. Standard errors are presented in parentheses and are clustered at the four-digit NAICS industry level; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ *Sources*: Author's calculations based on Compustat, Execucomp, IRS Statistics of Income, and Zwick and Mahon (2017) data.

Appendix G Effect of Tax Breaks on Firm Business Activities

In this appendix, I estimate the effect of the tax breaks on business activities for the sample of firms in the analysis dataset. I implement a firm level regression of business outcomes on the two tax breaks. Results are presented in Table A6. In Column (8), I implement a regression in the style of **?** to estimate the effect of bonus depreciation on after-tax present value investment costs per dollar of investment and the effect of the DPAD on effective tax rates. To do so, I regress taxes paid scaled by assets on taxable income scaled by assets and capital expenditure scaled by assets as well as BONUS interacted with capital expenditure scaled by assets and DPAD interacted with taxable income scaled by assets. The coefficient on the BONUS interaction is the percentage point reduction in after-tax investment costs due to bonus depreciation. The coefficient on the DPAD interaction is the percentage point reduction in effective tax rates due to the DPAD. These coefficients should be close to 0.01 if the treatment variables are correctly specified.

Consistent with Zwick and Mahon (2017), I find bonus depreciation increases capital investment, but has no effect on payouts. Interestingly, among the analysis sample, bonus depreciation decreases debt usage. This finding is not consistent with Zwick and Mahon (2017), but likely due to the very different samples. Consistent with Ohrn (2018), the DPAD increases capital expenditure, lowers debt usage, and increases payouts. Neither policy affects assets. The DPAD has a weak effect on stock return. The DPAD increases R&D while bonus depreciation decreases R&D. This finding is consistent with the investment incentive inducing a substitution toward investment and away from R&D. The DPAD increases ROA while bonus depreciation does not. This is consistent with the logic presented in **?** which shows bonus depreciation does not affect accounting earnings.

The BONUS $\times$ CX coefficient in Specification (8) suggests a one percentage point increase on BONUS decreases the after-tax cost of investment by 0.935 percentage points. The DPAD $\times$ PI coefficient in the same regression means a one percentage point decrease in DPAD decreases effective tax rates by 1.91 percent. Both of these coefficients are statistically different from zero at the 99% level. They are also statistically indistinguishable from 0.01 at standard levels of statistical significance. In sum, the findings in Specification (8) show that there is a strong first stage effect of both tax breaks and that the tax breaks are correctly specified.

Table A6: Effect of Tax Breaks on Firm Outcomes

	(1) Ln(CX)	(2) Debt Ratio	(3) Payouts / L.SL	(4) Ln(Assets)	(5) Stock Return	(6) ln_xrd	(7) ROA	(8) US Fed Tax
BONUS	0.117***	-0.0184*	-0.00211**	0.00671	-0.00946	-0.0586***	0.00850	
	(0.0192)	(0.00987)	(0.000812)	(0.0140)	(0.0154)	(0.0154)	(0.00593)	
DPAD	0.0593***	-0.0232***	0.00436***	0.00914	0.0350*	0.112***	0.0128***	
	(0.0210)	(0.00713)	(0.00144)	(0.0200)	(0.0190)	(0.0276)	(0.00417)	
PI								0.0290***
								(0.00290)
CapX								0.0339***
								(0.00604)
BONUS × CX								-0.00762***
								(0.00211)
DPAD × PI								-0.0191***
								(0.00473)
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	
Observations	19,285	20,554	20,107	20,606	20,313	20,606	20,597	17,491

Notes: Table A6 presents coefficient estimates of the effect of BONUS and DPAD on firm outcomes. The observational unit in each specification is a firm in a given year. The outcome variable in Specification (1) is the log of capital expenditure. The outcome variable in Specification (2) is the debt ratio. The outcome variable in Specification (3) is total payouts scaled by lagged sales. The outcome variable in specification (4) is firm size. The outcome variable in specification (5) is the stock return. The outcome in Specification (6) is Log R&D. The outcome in Specification (7) is ROA. The outcome in specification (8) is taxes paid scaled by total assets. All dependent variables in Specification (8) are scaled by assets. All specifications include firm and year fixed effects and the ETI control. All specifications other than (4) and (8) include firm size as a control. Standard errors are presented in parentheses and are clustered at the four-digit NAICS industry-level; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ *Sources*: Author's calculations based on Compustat, Execucomp, IRS Statistics of Income, and Zwick and Mahon (2017) data.

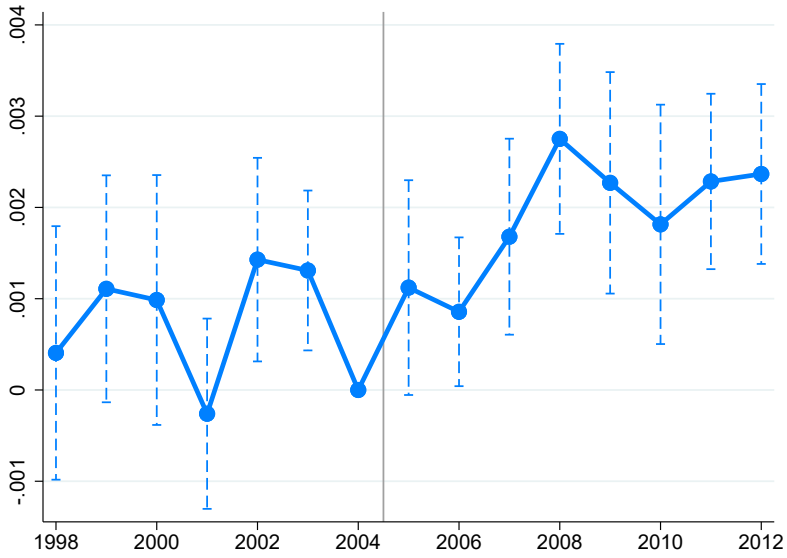
Appendix H Dynamic DPAD DD; Changing Taxable Status

This appendix presents an alternative dynamic DPAD estimates. The estimates are based on the following specification

$$\text{Ln(Comp)}_{i,t} = \beta_0 + \sum_{k=1998}^{2012} (\beta_k[\text{QPAI\%}_{j,a} \times \mathbb{1}[\text{Non-Taxable}_f, t] \times \mathbb{1}(k)]) + \beta_1[\text{BONUS}_{j,t}] + \gamma \mathbf{X}_{i,f,t} + \nu_t + \mu_f + \varepsilon_{i,t},$$

which is the same as estimating Equation (3), but allows the non-taxable indicator, $\mathbb{1}[\text{Non-Taxable}_f, t]$ to vary from year to year. $\beta_{1998} - \beta_{2012}$ estimates are presented in Figure A3. Consistent with the evidence presented in Figure A3 and Panel (a) of Figure 5, executive compensation is elevated in years 2007 and beyond.

Figure A3: DPAD Dynamic Difference-in-Differences Estimates



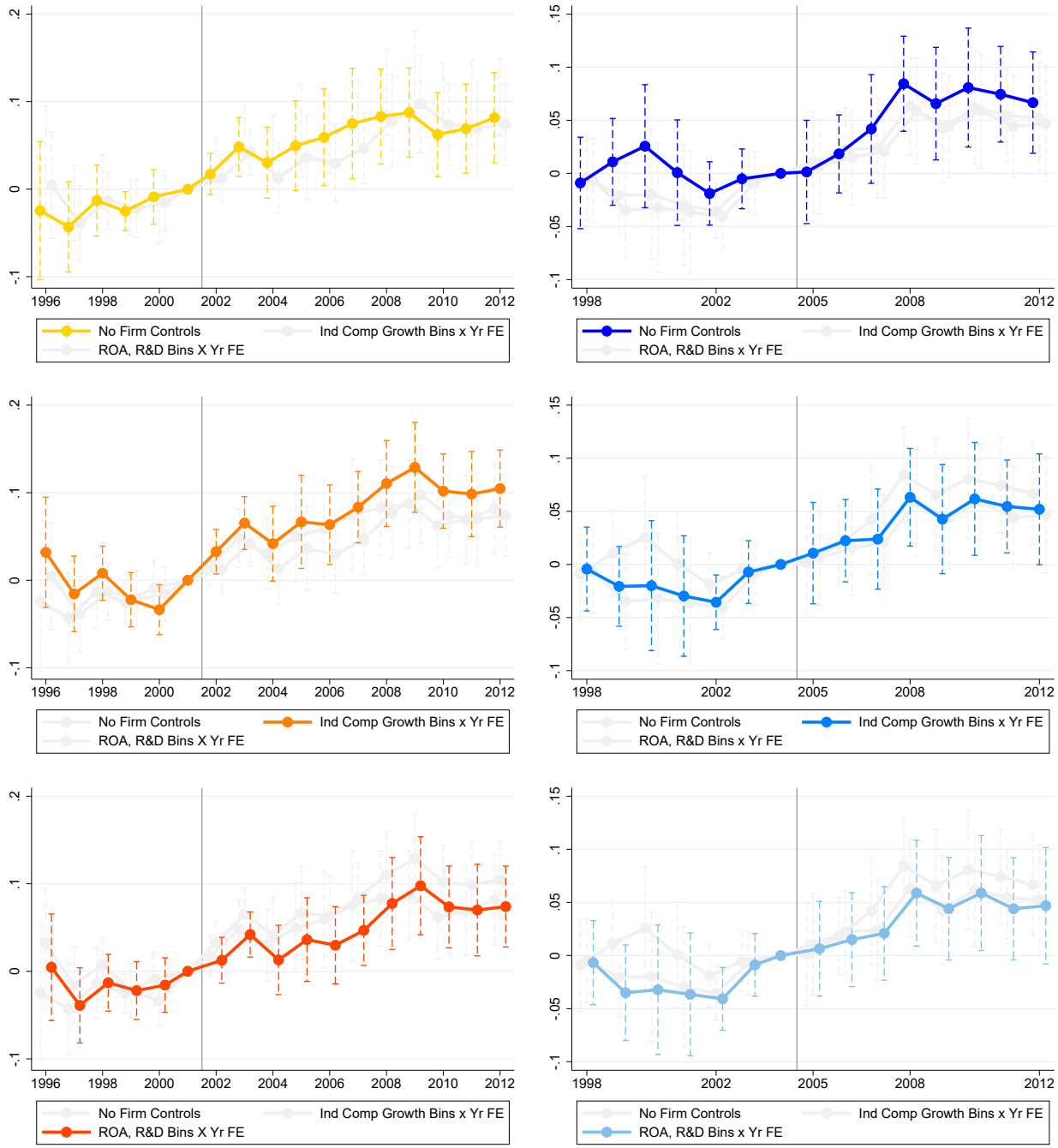
Notes: Figure A3 presents Dynamic Difference-in-Differences estimates as described in Section 5.1 and this appendix. The figure displays $\beta_{1998} - \beta_{2012}$ corresponding to estimating equation (3), but where the taxable status indicator is allowed to vary annually as firms enter and exit tax loss positions. The 2004 coefficient has been normalized to 0. DPAD is scaled such that the coefficients represent the difference between firms that derive 100% of their income from domestic manufacturing activities and firms that no income from domestic manufacturing activities. Vertical bands represent 95% confidence intervals. *Sources*: Author's calculations based on Compustat, Execucomp, IRS Statistics of Income, and Zwick and Mahon (2017) data.

Appendix I Separated Figure 5 Plots

Figure A4: Robustness of Dynamic Difference-in-Differences Estimates

(a) BONUS

(b) DPAD



Notes: Figure A4 presents each of the overlaid plots presented Figure 5 separately.

Appendix J Tax Break Outlier and Winsorization

Appendix J explores whether a select number of tax break outliers are driving the estimated effects. As a first step in this check, I create binned scatterplots that compare residualized values of executive compensation to residualized values of the tax breaks where the residuals are derived from the baseline model (Specification (4) of Table 2). These are presented Appendix Figure A5. For both tax breaks, the bulk of the binned data suggest a strong positive relationship. However, average values of residualized compensation at the extreme right of the distribution of each tax break are quite far from the regression line, suggesting that outliers may affect estimates. In Table A7, I present tax breaks estimates where I progressively winsorize both tax breaks at the 1%, 3%, 5%, and 10% level. Winsorizing the tax breaks increases the policy estimates suggesting tax break outliers lead to lower estimates. I rely on baseline estimates rather than those based on winsorized tax break variables as they are more conservative.

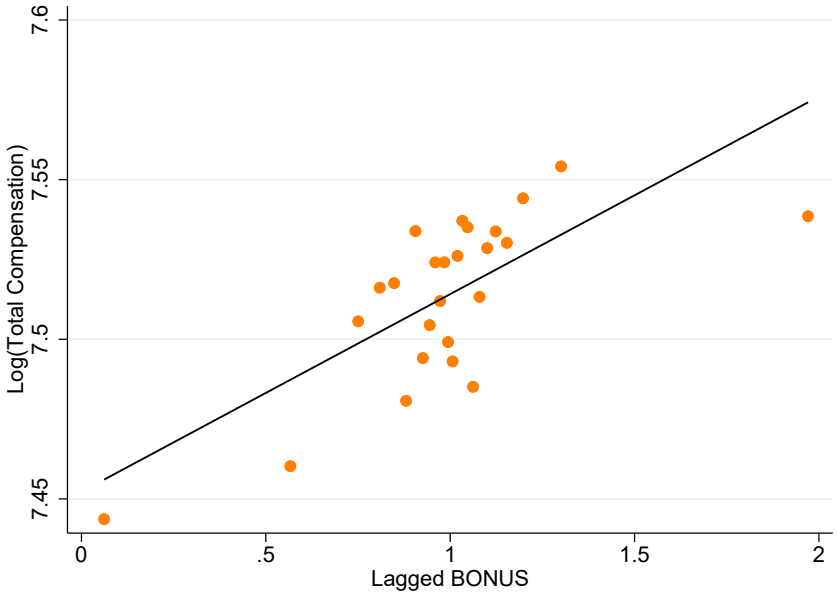
Table A7: Effect of Tax Breaks, Robustness to Winsorizing Tax Breaks

	(1)	(2)	(3)	(4)	(5)
	Ln(Comp)	Ln(Comp)	Ln(Comp)	Ln(Comp)	Ln(Comp)
Lagged BONUS	0.0619***	0.0622***	0.0630***	0.0662***	0.138***
	(0.0110)	(0.0110)	(0.0110)	(0.0112)	(0.0360)
Lagged DPAD	0.0423***	0.0426***	0.0430***	0.0446***	0.0510***
	(0.0135)	(0.0135)	(0.0136)	(0.0138)	(0.0146)
Year FE	✓	✓	✓	✓	✓
Firm Size Bins x Year FE	✓	✓	✓	✓	✓
Tax Breaks Winsorized at the 1% Lvl.		✓			
Tax Breaks Winsorized at the 3% Lvl.			✓		
Tax Breaks Winsorized at the 5% Lvl.				✓	
Tax Breaks Winsorized at the 10% Lvl.					✓
Observations	100,520	100,520	100,520	100,520	100,520

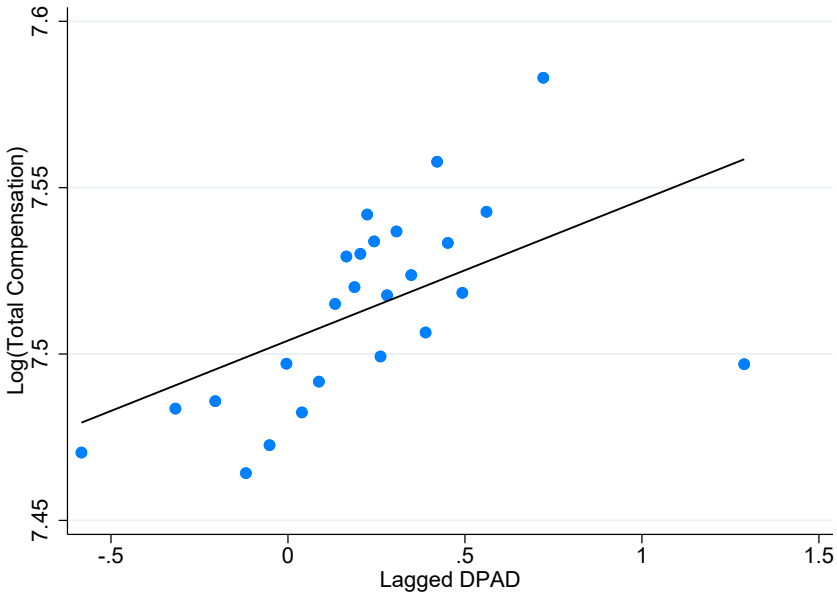
Notes: Table A7 shows how winsorizing the tax break variables at progressively more severe levels affects coefficient estimates. All specifications are based on Specification (4) from Table (2) and include firm fixed effects and firm size bins interacted with year fixed effects as well as controls for controls executive experience, gender, and lagged ETI. Specification (1) replicates baseline effects. Specifications (2)–(5) progressively winsorize the tax break variables at the 1%, 3%, 5%, and 10% levels. Standard errors are presented in parentheses and are clustered at the four-digit NAICS industry level; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. *Sources*: Author's calculations based on Compustat, Execucomp, IRS Statistics of Income, and Zwick and Mahon (2017) data.

Figure A5: Effect of Tax Breaks on Executive Compensation; Binscatter Graphs

(a) BONUS



(b) DPAD



Notes: Figure A5 presents binscatter plots showing the effect of each tax break on Ln(Comp). Black lines are linear projections based on the underlying data. Binscatter plots are conditional means of the outcome on 30 equal sized bins of the tax breaks. In creating each plot, the outcome variable has been residualized to exclude the effects of all firm, executive, and tax policy control variables as well as year and firm fixed effects. The resulting relationships and linear predictions (based on un-binned data) correspond to the Lagged BONUS and Lagged DPAD estimates from Specification (4) of Table 2. *Sources*: Author's calculations based on Compustat, Execucomp, IRS Statistics of Income, and Zwick and Mahon (2017) data.

Appendix K Bebchuk Governance Variable Construction

I use the Risk Metrics Governance and Governance Legacy datasets to construct the Bebchuk Governance measure used in the Table 7 analysis. The Governance Legacy dataset documents governance metrics for publicly traded firms in even years 1998–2006. The Governance dataset does the same in all years 2007–2011. I follow Bebchuk, Cohen and Ferrell (2009) in constructing an Entrenchment Index that can range from 0 to 6. The index is one point higher (1) if a super majority of shareholders must approve a merger or takeover, (2) if executives have a golden parachute (a large guaranteed payment if they are dismissed after a merger or takeover), (3) if management can enact poison-pill defenses to make a takeover less attractive, (4) if shareholders have limited abilities to amend the company's charter, (5) if shareholders have limited abilities to amend the company's bylaws, and (6) if the company elects board members using staggered elections. For years with no governance data, I use the measure from the previous year.

Appendix L Effect of Tax Breaks on Firm Governance Measures

Table A8: Effect of Tax Breaks on Firm Governance Measures

	(1) Large Holder	(2) Bebchuk Gov	(3) Executive Tenure
Lagged BONUS	0.00421*	0.0344	0.0814
	(0.00245)	(0.0299)	(0.0834)
Lagged DPAD	-0.00386*	0.0324	0.107
	(0.00213)	(0.0326)	(0.0920)
Year FE	✓	✓	✓
Firm FE	✓	✓	✓
Controls	✓	✓	✓
Observations	16,743	15,192	20,627

Notes: Table A8 shows how the tax breaks affect firm-level governance measures. The observational unit in each specification is a firm in a given year. All specifications include firm fixed effects and firm size bins interacted with year fixed effects as well as controls for controls for lagged ETI. The outcome variable in Specification (1) is Large Instit. Holder %. The outcome variable in Specification (2) is Bebchuk Governance. The outcome variable in Specification (3) is Executive Tenure. Standard errors are presented in parentheses and are clustered at the four-digit NAICS industry level; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. *Sources*: Author's calculations based on Execucomp, Compustat, Riskmetrics, Thomson Reuters, IRS Statistics of Income, and Zwick and Mahon (2017) data.

Appendix M Governance Interactions and Performance Outcomes

Table A9: Heterogeneous Effects of Tax Breaks by Governance Measures on ROA

	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) ROA
Lagged BONUS	-0.00437*	-0.000238	0.000627	-0.00770*	-0.000503
	(0.00264)	(0.00795)	(0.00682)	(0.00391)	(0.00813)
Lagged DPAD	0.00977**	0.0223***	0.0134**	0.00665	0.0121*
	(0.00376)	(0.00557)	(0.00670)	(0.00635)	(0.00617)
L.BONUS × 𝟙(Bebchuk Gov)	0.00107			0.00166	
	(0.00211)			(0.00343)	
L.DPAD × 𝟙(Bebchuk Gov)	-0.00221			-0.000218	
	(0.00399)			(0.00757)	
L.BONUS × 𝟙(Large Holder)		0.000695		0.000421	
		(0.00418)		(0.00213)	
L.DPAD × 𝟙(Large Holder)		-0.0147*		-0.00525	
		(0.00776)		(0.00913)	
L.BONUS × 𝟙(Exec Tenure)			0.00381	0.00130	
			(0.00457)	(0.00748)	
L.DPAD × 𝟙(Exec Tenure)			-0.0110	-0.000481	
			(0.0106)	(0.0211)	
L.BONUS × 𝟙(Combined Gov)					-0.00167
					(0.00305)
L.DPAD × 𝟙(Combined Gov)					0.0100
					(0.0117)
Year FE	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓
Observations	11,366	11,122	13,027	4,330	8,145

Notes: Table A10 repeats the Table 7 analysis, but at the firm level and replacing the outcome variable with ROA in order to test whether stronger governance measures induce executives to respond to the tax breaks in ways that increase ROA. All specifications include firm fixed effects and firm size bins interacted with year fixed effects a well as controls executive experience, gender, and lagged ETI. Standard errors are presented in parentheses and are clustered at the four-digit NAICS industry level; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ *Sources*: Author's calculations based on Execucomp, Compustat, Riskmetrics, Thomson Reuters, IRS Statistics of Income, and Zwick and Mahon (2017) data.

Table A10: Heterogeneous Effects of Tax Breaks by Governance Measures on Stock Return

	(1) Stk Return	(2) Stk Return	(3) Stk Return	(4) Stk Return	(5) Stk Return
Lagged BONUS	-0.0100	-0.0259	-0.0269	-0.0274*	-0.0465**
	(0.0225)	(0.0186)	(0.0290)	(0.0147)	(0.0198)
Lagged DPAD	-0.0205	-0.0415	-0.00153	0.0212	-0.0209
	(0.0275)	(0.0252)	(0.0277)	(0.0329)	(0.0292)
L.BONUS × 𝟙(Bebchuk Gov)	0.00391			0.00320	
	(0.0126)			(0.0142)	
L.DPAD × 𝟙(Bebchuk Gov)	0.000727			0.0269	
	(0.0287)			(0.0364)	
L.BONUS × 𝟙(Large Holder)		-0.00160		0.0117	
		(0.0170)		(0.0167)	
L.DPAD × 𝟙(Large Holder)		-0.00939		-0.0499	
		(0.0312)		(0.0321)	
L.BONUS × 𝟙(Exec Tenure)			0.0173	0.0322	
			(0.0277)	(0.0212)	
L.DPAD × 𝟙(Exec Tenure)			-0.0385	-0.153**	
			(0.101)	(0.0638)	
L.BONUS × 𝟙(Combined Gov)					0.00219
					(0.0219)
L.DPAD × 𝟙(Combined Gov)					-0.0294
					(0.0421)
Year FE	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓
Observations	11,369	11,053	12,877	4,331	8,126

Notes: Table A10 repeats the Table 7 analysis at the firm level, but at the firm level and replacing the outcome variable with Stock Return in order to test whether stronger governance measures induce executives to respond to the tax breaks in ways that increase Stock Return. All specifications include firm fixed effects and firm size bins interacted with year fixed effects a well as controls executive experience, gender, and lagged ETI. Standard errors are presented in parentheses and are clustered at the four-digit NAICS industry level; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ *Sources*: Author's calculations based on Execucomp, Compustat, Riskmetrics, Thomson Reuters, IRS Statistics of Income, and Zwick and Mahon (2017) data.