Internet Appendix for

Do Carbon Emissions Affect Stock Returns? Causal Evidence from a Supreme Court Ruling

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This Appendix provides supplemental materials and robustness checks in support of the manuscript.

Appendix IA.1 compiles a list of all United States Supreme Court cases related to government administration and the Clean Air Act between 2000 and 2024. Tables IA.1 and IA.5 detail our sample selection process and the classification of carbon emission data types in the Trucost database. Tables IA.2, IA.4, IA.6, IA.7, and IA.8 provide a series of robustness checks. Table IA.3 presents the long-term valuation effects of the Supreme Court ruling on stock returns. IA.9, IA.10, IA.11, and IA.12 explore heterogeneity in the ruling's impact across different firm and state characteristics. Table IA.13 shows the effect of the court ruling on firms' implied cost of equity. Table IA.14 provides the estimation results for the Supreme Court's *Massachusetts v. EPA* ruling.

Appendix IA.1 Selected United States Supreme Court Cases Related to Government Administration and the Clean Air Act

We compile a list of selected United States Supreme Court cases related to government administration and the Clean Air Act (CAA) after 2000 as follows.[1]

1. *Whitman v. American Trucking Associations* (2001)

This case emerged from the Environmental Protection Agency's (EPA) 1997 revision of the National Ambient Air Quality Standards, focusing on ozone and fine particulate matter as per the Clean Air Act. This revision was met with opposition from the American Trucking Associations and various industrial groups, who contended that the EPA should consider economic costs when setting these standards. The central issue was whether the EPA had the authority to establish air quality standards based solely on public health considerations, without incorporating economic factors. On February 27, 2001, the Supreme Court delivered a unanimous ruling upholding the EPA's authority to set these standards based only on health considerations.

2. *Alaska Department of Environmental Conservation v. EPA* (2004)

This case revolved around the conflict between the Alaska Department of Environmental Conservation (ADEC) and the EPA regarding the Clean Air Act's permit program. The core dispute was ADEC's refusal to enforce EPA's determination that a proposed upgrade by Teck Cominco Alaska Incorporated at a zinc mine would increase pollution beyond allowable levels. The EPA argued that it had the authority to override the state's decision under the Act's provisions. On January 21, 2004, the Supreme Court ruled in favor of the EPA, holding that the federal agency had the authority to enforce its pollution control requirements and clarifying the balance of power between state and federal agencies under the Clean Air Act.

3. *Department of Transportation v. Public Citizen* (2004)

This case centered around a dispute involving the Federal Motor Carrier Safety Administration (FMCSA), a branch of the Department of Transportation (DOT), and its regulatory authority under the National Environmental Policy Act (NEPA) and the Clean Air Act. The conflict arose over FMCSA's decision to implement regulations that would allow Mexican trucks to operate in the United States, as per the North American Free Trade Agreement (NAFTA). Public Citizen and other environmental and labor groups challenged this, arguing that FMCSA should have considered the environmental impact of increased truck emissions under NEPA. On June 7, 2004, the Supreme Court ruled in favor of the DOT, concluding that the FMCSA did not

[1] These cases are from JUSTIA (https://supreme.justia.com/cases/federal/us/).

have the discretion to prevent cross-border operations and thus was not required to evaluate the environmental impact under NEPA.

4. *Massachusetts v. EPA* (2007)

This case arose from a dispute over the EPA's responsibility to regulate greenhouse gas emissions, particularly carbon dioxide, under the Clean Air Act. The controversy began when the EPA, in 2003, declined to regulate these emissions, arguing that it lacked authority under the Clean Air Act and citing uncertainty in climate change science. The State of Massachusetts, along with several other states and environmental groups, challenged this decision, asserting that the EPA was obligated to regulate greenhouse gases as air pollutants. On April 2, 2007, the Supreme Court ruled in a decision that greenhouse gases are air pollutants covered by the Clean Air Act, and the EPA had the authority to regulate their emissions from new motor vehicles.

5. *Environmental Defense v. Duke Energy Corp.* (2007)

This case centered on the interpretation of the Clean Air Act's New Source Review (NSR) program. The dispute arose when Environmental Defense and the United States government accused Duke Energy Corporation of modifying several of its power plants in a manner that increased emissions, without obtaining the necessary permits under the NSR program. Duke Energy argued that these modifications were routine maintenance, therefore exempt from NSR requirements. On April 2, 2007, the Supreme Court ruled against Duke Energy, holding that any physical change or change in the method of operation that increases emissions necessitates an NSR permit, regardless of whether it's routine maintenance.

6. *American Electric Power Co. v. Connecticut* (2011)

Several states, New York City, and environmental groups sued major electric power companies, including American Electric Power (AEP), alleging that their carbon dioxide emissions contributed to global warming and constituted a public nuisance under federal common law. The plaintiffs sought injunctive relief, requiring the companies to reduce their emissions. The central issue was whether states and private parties could seek emissions caps on utilities for their contribution to climate change through federal common law nuisance claims. On June 20, 2011, the Supreme Court ruled that the Clean Air Act and the EPA authority it grants displace any federal common law right to seek abatement of carbon dioxide emissions from fossil-fuel fired power plants.

7. *Utility Air Regulatory Group v. EPA* (2014)

This case involved a legal challenge to the EPA's authority to regulate greenhouse gas emissions from stationary sources under the Clean Air Act. The controversy began when the EPA determined that its motor vehicle greenhouse gas regulations automatically triggered

permitting requirements for stationary sources. Several states and industry groups, including the Utility Air Regulatory Group, contested this interpretation, arguing that the EPA exceeded its statutory authority by applying these regulations to stationary sources. On June 23, 2014, the Supreme Court issued a mixed ruling. While the Court upheld the EPA's authority to regulate greenhouse gas emissions from sources already required to obtain permits for other pollutants, it also held that the EPA could not require permits solely based on greenhouse gas emissions.

8. *Michigan v. EPA* (2015)

This case revolved around the EPA's decision to regulate mercury and other toxic emissions from power plants under the Clean Air Act. The controversy was sparked by the EPA's refusal to consider costs in its initial determination that regulation of these emissions was appropriate and necessary. Several states, led by Michigan, along with industry groups, challenged this approach. On June 29, 2015, the Supreme Court ruled in a 5-4 decision that the EPA acted unreasonably by not considering the cost of compliance in its initial decision to regulate these emissions. The Court's decision emphasized the need for the EPA to take into account economic factors when making regulatory decisions.

9. *West Virginia v. EPA* (2022)

This case arose in response to the EPA's Clean Power Plan, an Obama-era regulation aimed at shifting electricity generation away from coal toward cleaner energy sources. Several states, led by West Virginia, argued that the EPA overstepped its authority by attempting to implement broad, sector-wide changes to the nation's energy mix without clear congressional authorization. On June 30, 2022, the Supreme Court, in a 6–3 decision authored by Chief Justice John Roberts, ruled in favor of West Virginia. The majority held that the EPA's actions involved a "major question" of political and economic significance, and under the newly emphasized *major questions doctrine*, such significant decisions require explicit authorization from Congress. This decision marks a turning point in administrative law and environmental regulation, as it limits federal agencies' ability to address major issues without clear legislative backing, and is widely regarded as a constraint on the federal government's capacity to combat climate change through regulatory action.

10. *Ohio v. EPA* (2024)

This is a Supreme Court case concerning the scope of the EPA's authority under the Clean Air Act, particularly its "Good Neighbor" provision, which requires states to prevent their air pollution from adversely affecting neighboring states. The dispute arose after the EPA denied the state implementation plans (SIPs) of 23 states, including Ohio, in response to a 2015

revision of ozone pollution standards. The EPA subsequently issued a federal implementation plan (FIP) to enforce compliance. Ohio challenged the plan, arguing that it would place excessive strain on the U.S. power grid. On June 27, 2024, in a 5–4 decision, the Supreme Court sided with Ohio and granted a stay on the EPA's FIP pending further judicial review. The decision reflects the Court's growing scrutiny of administrative agency authority and signals potential constraints on federal environmental regulation.

Table IA.1 Sample Selection Procedure

Sample Selection Procedure:	# observations	# distinct firms
Firms issued common stocks on NYSE, AMEX, and Nasdaq covered by CRSP from [-252,20] trading days	1,173,798	4,619
less firms without at least 100 return observations	1,164,060	4,443
less firms missing return observations on the event day	1,141,894	4,317
less firms with missing GVKEY or missing total assets	1,041,747	3,884
less firms in the financial industry (SICs 6000 to 6999)	864,287	3,228
less firms without Trucost data	619,007	2,270
less firms with missing controls and keep the event day	2,255	2,255

Notes. This table summarizes the procedure used to construct the final sample.

Table IA.2 Stock Market Reaction to the *West Virginia v. EPA* Ruling: Excluding Less-Affected Firms

Panel A: Excluding Firms without Environment-related Offenses

	Dep. Var. =			
	CAR(-3,0)	*CAR(-3,1)*	*CAR(-3,0)*	*CAR(-3,1)*
	Scope 1		Scope 1 + Scope 2	
	(1)	(2)	(3)	(4)
Ln(Emission Intensity)	0.435***	0.595***	0.416**	0.559**
	(3.233)	(3.140)	(2.482)	(2.457)
Firm controls	Yes	Yes	Yes	Yes
Observations	476	476	476	476
Adjusted R^2	0.1367	0.1532	0.1261	0.1404

Panel B: Excluding Firms with Greenhouse Gas Emissions in the Bottom Quartile

	Dep. Var. =			
	CAR(-3,0)	*CAR(-3,1)*	*CAR(-3,0)*	*CAR(-3,1)*
	Scope 1		Scope 1 + Scope 2	
	(1)	(2)	(3)	(4)
Ln(Emission Intensity)	0.377***	0.347***	0.360***	0.300**
	(4.085)	(3.169)	(3.120)	(2.191)
Firm controls	Yes	Yes	Yes	Yes
Observations	1691	1691	1691	1691
Adjusted R^2	0.0537	0.0502	0.0495	0.0471

Notes. This table presents estimation results from ordinary least squares regressions of cumulative abnormal returns (CARs) on firms' emission intensity excluding less-affected firms. In Panel A, we exclude firms that have never committed environment-related violations. In Panel B, we exclude firms in the bottom quartile of GHG emissions. *CAR(t_1, t_2)* is cumulative abnormal returns estimated as the sum of daily abnormal returns based on the Fama-French five-factor model from day t_1 to t_2 with June 30, 2022 as the event date. In Columns 1-2, *Ln(Emission Intensity)* is the natural logarithm of the ratio of scope 1 GHG emissions to revenues in 2021. In Columns 3-4, *Ln(Emission Intensity)* is the natural logarithm of the average value of the ratio of scope 1 and scope 2 GHG emissions to revenues in 2021. All regressions include firm-level controls, i.e., *Market-to-Book, ROA, Cash Holdings, Tangibility, Capital Expenditure, Market Leverage, Dividend Payout,* and *Firm Size*. Numbers in parentheses are *t*-statistics estimated from standard errors adjusted for heteroskedasticity. *, **, and ***, indicate statistical significance at the 10%, 5%, and 1% level, respectively. Detailed variable definitions are presented in Appendix B.

Table IA.3 Long-term Stock Market Reaction to the *West Virginia v. EPA* Ruling

	Dep. Var. =			
	CAR(-1,20)	*CAR(-1,40)*	*CAR(-1,20)*	*CAR(-1,40)*
	Scope 1		Scope 1 + Scope 2	
	(1)	(2)	(3)	(4)
Ln(Emission Intensity)	1.281***	1.151***	1.430***	1.637***
	(5.146)	(3.385)	(4.584)	(3.766)
Firm controls	Yes	Yes	Yes	Yes
Observations	2255	2255	2255	2255
Adjusted R^2	0.0314	0.0306	0.0292	0.0314

Notes. This table presents estimation results from ordinary least squares regressions of cumulative abnormal returns (CARs) on firms' emission intensity. *CAR(t_1, t_2)* is cumulative abnormal returns estimated as the sum of daily abnormal returns based on the Fama-French five-factor model from day t_1 to t_2 with June 30, 2022 as the event date. In Columns 1-2, *Ln(Emission Intensity)* is the natural logarithm of the ratio of scope 1 GHG emissions to revenues in 2021. In Columns 3-4, *Ln(Emission Intensity)* is the natural logarithm of the average value of the ratio of scope 1 and scope 2 GHG emissions to revenues in 2021. All regressions include firm-level controls, i.e., *Market-to-Book, ROA, Cash Holdings, Tangibility, Capital Expenditure, Market Leverage, Dividend Payout,* and *Firm Size*. Numbers in parentheses are *t*-statistics estimated from standard errors adjusted for heteroskedasticity. *, **, and ***, indicate statistical significance at the 10%, 5%, and 1% level, respectively. Detailed variable definitions are presented in Appendix B.

Table IA.4 Stock Market Reaction to *West Virginia v. EPA* Using Alternative Models

Panel A: Emission Intensity and CARs: Market Model and Fama-French Three-Factor Model

	Dep. Var. =			
	CAR MK (-3,0)	*CAR MK (-3,1)*	*CAR FF3 (-3,0)*	*CAR FF3 (-3,1)*
	(1)	(2)	(3)	(4)
Ln(Emission Intensity)	0.309***	0.334***	0.309***	0.308***
	(3.223)	(3.149)	(3.132)	(2.811)
Firm controls	Yes	Yes	Yes	Yes
Observations	2255	2255	2255	2255
Adjusted R^2	0.0418	0.0280	0.0315	0.0247

Panel B: Climate Risk Beta and CARs: Market Model and Fama-French Three-Factor Model

	Dep. Var. =			
	CAR MK (-3,0)	*CAR MK (-3,1)*	*CAR FF3 (-3,0)*	*CAR FF3 (-3,1)*
	(1)	(2)	(3)	(4)
Climate Risk Beta	0.037**	0.053***	0.047***	0.065***
	(2.160)	(2.755)	(2.676)	(3.197)
Firm controls	Yes	Yes	Yes	Yes
Observations	2080	2080	2080	2080
Adjusted R^2	0.0599	0.0425	0.0458	0.0386

Panel C: Climate Risk ^{LSTY} and CARs: Market Model and Fama-French Three-Factor Model

	Dep. Var. =			
	CAR MK (-3,0)	*CAR MK (-3,1)*	*CAR FF3 (-3,0)*	*CAR FF3 (-3,1)*
	(1)	(2)	(3)	(4)
Climate Risk ^{LSTY}	0.239**	0.265*	0.241*	0.288*
	(2.052)	(1.830)	(1.849)	(1.774)
Firm controls	Yes	Yes	Yes	Yes
Observations	1541	1541	1541	1541
Adjusted R^2	0.0559	0.0464	0.0436	0.0478

Notes. This table presents results from ordinary least squares regressions of cumulative abnormal returns (CARs) on carbon emission measures. The dependent variables, *CAR MK (t_1, t_2)* and *CAR FF3 (t_1, t_2),* are cumulative abnormal returns estimated as the sum of daily abnormal returns based on the market model and Fama-French three-factor model from day t_1 to t_2 where June 30, 2022 is the event date, respectively. In Panel A, *Ln(Emission Intensity)* is the natural logarithm of the ratio of scope 1 GHG emissions to revenues in 2021. In Panel B, *Climate Risk Beta* is the sensitivity of a firm's scope 1 GHG emission intensity to the market emission intensity, measured by the coefficient estimated from regressing a firm's emission intensity on the market emission intensity. In Panel C, *Climate Risk* ^{LSTY} is the frequency of mentions of the unigrams or bigrams related to the transition climate discussion, scaled by the total length of the transcript, and then multiplied by 10^4. All regressions include firm-level controls, i.e., *Market-to-Book, ROA, Cash Holdings, Tangibility, Capital Expenditure, Market Leverage, Dividend Payout,* and *Firm Size*. Numbers in parentheses are *t*-statistics estimated from standard errors adjusted for heteroskedasticity. *, **, and ***, indicate statistical significance at the 10%, 5%, and 1% level, respectively. Detailed variable definitions are presented in Appendix B.

Table IA.5 Trucost Data Selection Procedure and Classification

Panel A: Trucost Data Selection Procedure

Sample Selection Procedure:	# firm-years	# distinct firms
Trucost data between 2002 and 2021	2,761,128	2,583,978
less non-listed firms	131,116	17,374
less firms with missing GVKEY	130,932	17,454
less non-U.S. firms	23,808	3,127
less data prior to 2021	2,887	2,887

Panel B: Trucost Data Type

Original Data Description	Percent
Exact Data	
Exact Value from CDP	9.84%
Exact Value from Environmental/CSR	1.18%
Derived Data	
Value derived from data provided in Environmental/CSR	8.56%
Value derived from data provided in CDP	6.27%
Derived from previous year	1.77%
Value summed up from data provided in Environmental/CSR	0.55%
Value split from data provided in Environmental/CSR	0.31%
Value derived from fuel use provided in Environmental/CSR	0.24%
Value derived from fuel use provided in Annual Report/Financial Accounts Disclosure	0.21%
Data approximated from chart/graph in Environmental Report/CSR Report/Website	0.03%
Value derived from data provided in Annual Report/Financial Accounts Disclosure	0.03%
Value summed up from data provided in CDP	0.03%
Estimated Data	
Estimated data (no further explanation)	65.29%
Estimate used instead of disclosure - data does not cover global operations	5.40%
Estimate based on partial data disclosure in Environmental/CSR	0.17%
Estimate used instead of disclosure - data is normalized and no aggregating factor is available	0.07%
Estimate based on partial data disclosure in CDP	0.03%

Note. This table presents the sample selection process of Trucost data and the data classification scheme. Panel A outlines the step-by-step selection procedure applied to Trucost data. Panel B provides an overview of the original data descriptions in Trucost and our classification of data into “Exact”, “Derived”, and “Estimated” categories.

Table IA.6 Stock Market Reaction to *West Virginia v. EPA* Adjusted for Data Release Lag

	Dep. Var. =			
	CAR(-3,0)	*CAR(-3,1)*	*CAR(-3,0)*	*CAR(-3,1)*
	Fiscal Year 2020		Effective Year 2021	
	(1)	(2)	(3)	(4)
Ln(Emission Intensity)	0.341***	0.326***	0.361***	0.284**
	(3.570)	(3.003)	(3.255)	(2.160)
Firm controls	Yes	Yes	Yes	Yes
Observations	2163	2163	1366	1366
Adjusted R^2	0.0401	0.0282	0.0215	0.0186

Notes. This table reports estimation results from ordinary least squares regressions of cumulative abnormal returns (CARs) on firms' emission intensity measured over different periods. *CAR(t_1, t_2)* is cumulative abnormal returns estimated as the sum of daily abnormal returns based on the Fama-French five-factor model from day t_1 to t_2 during which June 30, 2022 is the event date. In Columns 1-2, *Ln(Emission Intensity)* is the natural logarithm of the ratio of scope 1 GHG emissions to revenues in 2020. In Columns 3-4, *Ln(Emission Intensity)* is the natural logarithm of the ratio of scope 1 GHG emissions to revenues reported as of 2021. All regressions include firm-level controls, i.e., *Market-to-Book, ROA, Cash Holdings, Tangibility, Capital Expenditure, Market Leverage, Dividend Payout,* and *Firm Size*. Numbers in parentheses are *t*-statistics estimated from standard errors adjusted for heteroskedasticity. *, **, and ***, indicate statistical significance at the 10%, 5%, and 1% level, respectively. Detailed variable definitions are presented in Appendix B.

Table IA.7 Stock Market Reaction to *West Virginia v. EPA* Based on Weighted Climate Risk Beta

	Dep. Var. = CAR					
	FF5(-3,0)	*FF5(-3,1)*	*MK(-3,0)*	*MK(-3,1)*	*FF3(-3,0)*	*FF3(-3,1)*
	(1)	(2)	(3)	(4)	(5)	(6)
Weighted Climate Risk Beta	0.078***	0.123***	0.062**	0.095***	0.079***	0.118***
	(2.649)	(3.559)	(2.116)	(2.933)	(2.657)	(3.472)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2080	2080	2080	2080	2080	2080
Adjusted R^2	0.0523	0.0380	0.0599	0.0428	0.0459	0.0390

Notes. This table presents results from ordinary least squares regressions of cumulative abnormal returns (CARs) on the weighted climate risk beta. *Weighted Climate Risk Beta* is the sensitivity of a firm's scope 1 GHG emission intensity to the market emission intensity, measured by the coefficient estimated from regressing a firm's emission intensity on the sales-weighted market emission intensity. *CAR(t_1, t_2)* is cumulative abnormal returns estimated as the sum of daily abnormal returns based on the Fama-French five-factor model (*FF5*), market model (*MK*), and Fama-French three-factor model (*FF3*) from day t_1 to t_2 during which June 30, 2022 is the event date. All regressions include firm-level controls, i.e., *Market-to-Book, ROA, Cash Holdings, Tangibility, Capital Expenditure, Market Leverage, Dividend Payout,* and *Firm Size*. Numbers in parentheses are *t*-statistics estimated from standard errors adjusted for heteroskedasticity. *, **, and ***, indicate statistical significance at the 10%, 5%, and 1% level, respectively. Detailed variable definitions are presented in Appendix B.

Table IA.8 Stock Market Reaction to *West Virginia v. EPA* Using Alternative Transition Risk Indicators

	Dep. Var. =					
	CAR(-3,0)	*CAR(-3,1)*	*CAR(-3,0)*	*CAR(-3,1)*	*CAR(-3,0)*	*CAR(-3,1)*
	(1)	(2)	(3)	(4)	(5)	(6)
CAA-covered	1.378***	0.772**				
	(4.478)	(2.093)				
TRI-covered			1.444***	0.941***		
			(4.949)	(2.897)		
IPCC-covered					2.212***	1.767***
					(7.661)	(5.508)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2255	2255	2255	2255	2255	2255
Adjusted R^2	0.0352	0.0230	0.0395	0.0249	0.0486	0.0316

Notes. This table reports results from ordinary least squares regressions of cumulative abnormal returns (CARs) on alternative independent variables. *CAA-covered* is an indicator taking one if the firm has air emissions covered by the Greenhouse Gas Reporting Program and Clean Air Markets Division in 2021, zero otherwise. *TRI-covered* is an indicator equaling one if the NAICS of the firm is covered by the Toxics Release Inventory (TRI) program of the EPA, and zero otherwise. *IPCC-covered* is an indicator taking one if 2-digit NAICS codes are covered by five major industry sectors of IPCC: 11 (Agriculture, Forestry, Fishing and Hunting), 21 (Mining), 22 (Utilities), 23 (Construction), 31 (Food), 32 (Paper), 33 (Metal), 48 (Transportation), and 56 (Administrative and Support and Waste Management and Remediation Services). *CAR(t_1, t_2)* is cumulative abnormal returns estimated as the sum of daily abnormal returns based on the Fama-French five-factor model from day t_1 to t_2 during which June 30, 2022 is the event date. Across columns, we vary the length of the event window. All regressions include firm-level controls, i.e., *Market-to-Book, ROA, Cash Holdings, Tangibility, Capital Expenditure, Market Leverage, Dividend Payout,* and *Firm Size*. Numbers in parentheses are *t*-statistics estimated from standard errors adjusted for heteroskedasticity. *, **, and ***, indicate statistical significance at the 10%, 5%, and 1% level, respectively. Detailed variable definitions are presented in Appendix B.

Table IA.9 The Impact of Environmental Ratings

	Dep. Var. = CAR(-3,0)		*Dep. Var. = CAR(-3,1)*	
	Low Rating	High Rating	Low Rating	High Rating
	(1)	(2)	(3)	(4)
Ln(Emission Intensity)	0.656***	0.026	0.730***	-0.035
	(4.925)	(0.187)	(4.794)	(-0.227)
Coefficient equality test	(1) = (2)		(3) = (4)	
Observed difference	0.630***		0.765***	
(*p*-value)	0.001		0.000	
Firm controls	Yes	Yes	Yes	Yes
Observations	995	1260	995	1260
Adjusted R^2	0.0406	0.0334	0.0434	0.0219

Notes. This table presents estimation results from ordinary least squares regressions of cumulative abnormal returns (CARs) on firms' carbon intensity. *CAR(t_1, t_2)* is cumulative abnormal returns estimated as the sum of daily abnormal returns based on the Fama-French five-factor model from day t_1 to t_2 during which June 30, 2022 is the event date. *Ln(Emission Intensity)* is the natural logarithm of the ratio of scope 1 GHG emissions to revenues in 2021. We partition the sample based on net environment ratings: *Low Rating* (net environmental rating≤0) and *High Rating* (net environmental rating>0). Environmental ratings are obtained from MSCI ESG Research Data. All regressions include firm-level controls, i.e., *Market-to-Book, ROA, Cash Holdings, Tangibility, Capital Expenditure, Market Leverage, Dividend Payout,* and *Firm Size*. Numbers in parentheses are *t*-statistics estimated from standard errors adjusted for heteroskedasticity. *, **, and ***, indicate statistical significance at the 10%, 5%, and 1% level, respectively. Detailed variable definitions are presented in Appendix B.

Table IA.10 The Impact of Institutional Investors

	Dep. Var. = CAR(-3,0)		*Dep. Var. = CAR(-3,1)*	
	High Institutional Ownership	Low Institutional Ownership	High Institutional Ownership	Low Institutional Ownership
	(1)	(2)	(3)	(4)
Ln(Emission Intensity)	0.590***	0.045	0.652***	-0.064
	(5.920)	(0.269)	(4.913)	(-0.376)
Coefficient equality test	(1) = (2)		(3) = (4)	
Observed difference	0.545***		0.716***	
(*p*-value)	0.003		0.001	
Firm controls	Yes	Yes	Yes	Yes
Observations	1114	1114	1114	1114
Adjusted R^2	0.0483	0.0404	0.0477	0.0243

Notes. This table presents estimation results from ordinary least squares regressions of cumulative abnormal returns (CARs) on firms' emission intensity. *CAR(t_1, t_2)* is cumulative abnormal returns estimated as the sum of daily abnormal returns based on the Fama-French five-factor model from day t_1 to t_2 during which June 30, 2022 is the event date. *Ln(Emission Intensity)* is the natural logarithm of the ratio of scope 1 GHG emissions to revenues in 2021. We divide the sample based on the median of institutional ownership in 2021. All regressions include firm-level controls, i.e., *Market-to-Book, ROA, Cash Holdings, Tangibility, Capital Expenditure, Market Leverage, Dividend Payout,* and *Firm Size*. Numbers in parentheses are *t*-statistics estimated from standard errors adjusted for heteroskedasticity. *, **, and ***, indicate statistical significance at the 10%, 5%, and 1% level, respectively. Detailed variable definitions are presented in Appendix B.

Table IA.11 The Impact of Financial Constraints

Panel A: Text-based Financial Constraints Measure

	Dep. Var. = CAR(-3,0)		*Dep. Var. = CAR(-3,1)*	
	More Financially Constrained	Less Financially Constrained	More Financially Constrained	Less Financially Constrained
	(1)	(2)	(3)	(4)
Ln(Emission Intensity)	0.417***	0.005	0.380***	0.029
	(4.130)	(0.021)	(3.116)	(0.128)
Coefficient equality test	(1) = (2)		(3) = (4)	
Observed difference	0.413**		0.351*	
(*p*-value)	0.017		0.055	
Firm controls	Yes	Yes	Yes	Yes
Observations	1255	1000	1255	1000
Adjusted R^2	0.0698	0.0447	0.0975	0.0306

Panel B: Alternative Financial Constraints Measure

	Dep. Var. = CAR(-3,0)		*Dep. Var. = CAR(-3,1)*	
	More Financially Constrained	Less Financially Constrained	More Financially Constrained	Less Financially Constrained
	(1)	(2)	(3)	(4)
Ln(Emission Intensity)	0.415***	0.004	0.421***	-0.094
	(3.982)	(0.016)	(3.366)	(-0.430)
Coefficient equality test	(1) = (2)		(3) = (4)	
Observed difference	0.412**		0.515**	
(*p*-value)	0.017		0.010	
Firm controls	Yes	Yes	Yes	Yes
Observations	1255	1000	1255	1000
Adjusted R^2	0.0665	0.0413	0.0960	0.0218

Notes. This table reports estimation results from ordinary least squares regressions of cumulative abnormal returns (CARs) on firms' emission intensity. *CAR(t_1, t_2)* is cumulative abnormal returns estimated as the sum of daily abnormal returns based on the Fama-French five-factor model from day t_1 to t_2 during which June 30, 2022 is the event date. *Ln(Emission Intensity)* is the natural logarithm of the ratio of scope 1 GHG emissions to revenues in 2021. In Panel A, we partition the sample based on the median of average debt-focused financial constraints over the five years before the court ruling. In Panel B, we partition the sample based on the median of debt-focused financial constraints calculated using the primitive model. All regressions include firm-level controls, i.e., *Market-to-Book, ROA, Cash Holdings, Tangibility, Capital Expenditure, Market Leverage, Dividend Payout,* and *Firm Size*. Numbers in parentheses are *t*-statistics estimated from standard errors adjusted for heteroskedasticity. *, **, and ***, indicate statistical significance at the 10%, 5%, and 1% level, respectively. Detailed variable definitions are presented in Appendix B.

Table IA.12 The Impact of Cash Holdings

	Dep. Var. = CAR(-3,0)		*Dep. Var. = CAR(-3,1)*	
	Low Cash Holdings	High Cash Holdings	Low Cash Holdings	High Cash Holdings
	(1)	(2)	(3)	(4)
Ln(Emission Intensity)	0.449***	-0.101	0.456***	-0.241
	(4.478)	(-0.499)	(3.665)	(-1.148)
Coefficient equality test	(1) = (2)		(3) = (4)	
Observed difference	0.551***		0.697***	
(*p*-value)	0.003		0.001	
Firm controls	Yes	Yes	Yes	Yes
Observations	1128	1127	1128	1127
Adjusted R^2	0.0689	0.0364	0.0899	0.0204

Notes. This table reports estimation results from ordinary least squares regressions of cumulative abnormal returns (CARs) on firms' emission intensity. $CAR(t_1, t_2)$ is cumulative abnormal returns estimated as the sum of daily abnormal returns based on the Fama-French five-factor model from day t_1 to t_2 during which June 30, 2022 is the event date. *Ln(Emission Intensity)* is the natural logarithm of the ratio of scope 1 GHG emissions to revenues in 2021. We partition the sample based on the median of the cash holdings measured by the ratio of cash and short-term investments to total assets in 2021. All regressions include firm-level controls, i.e., *Market-to-Book, ROA, Cash Holdings, Tangibility, Capital Expenditure, Market Leverage, Dividend Payout,* and *Firm Size*. Numbers in parentheses are *t*-statistics estimated from standard errors adjusted for heteroskedasticity. *, **, and ***, indicate statistical significance at the 10%, 5%, and 1% level, respectively. Detailed variable definitions are presented in Appendix B.

Table IA.13 The Impact of the Court Ruling on the Cost of Equity

	Dep. Var. =	
	Implied Cost of Equity$_1$	*Implied Cost of Equity*$_2$
	(1)	(2)
Ln(Emission Intensity) × Post Ruling	0.003	0.004
	(0.344)	(1.047)
Firm controls	Yes	Yes
Firm FE	Yes	Yes
Month FE	Yes	Yes
Observations	8587	5693
Adjusted R^2	0.7829	0.8135

Notes. This table reports results from ordinary least squares regressions of implied cost of equity on the interaction of the emission intensity and the post-ruling dummy. We construct a monthly panel dataset for a 12-month window ([-6, +6] months) around the event date. We estimate *Implied Cost of Equity 1* and *Implied Cost of Equity 2* using two distinct models to assess a firm's cost of equity, respectively. Analysts' earnings expectations data are from Summary Statistics of the Thomson Reuters I/B/E/S Estimates Database. *Post Ruling* is an indicator variable that equals one if the date is after June 30, 2022, and zero otherwise. *Ln(Emission Intensity)* is the natural logarithm of the ratio of scope 1 GHG emissions to revenues in 2021. All regressions include firm fixed effects, time fixed effects, and firm-level controls as in Table 2. Numbers in parentheses are *t*-statistics estimated from standard errors adjusted for heteroskedasticity and clustered at the firm level. *, **, and ***, indicate statistical significance at the 10%, 5%, and 1% level, respectively. Detailed variable definitions are presented in Appendix B.

Table IA.14 Stock Market Reaction to the Supreme Court Ruling of Massachusetts v. EPA

Panel A: Independent Variable Defined by Industries

	Dep. Var. =			
	CAR(-3,0)	*CAR(-3,1)*	*CAR(-1,0)*	*CAR(-1,1)*
	(1)	(2)	(3)	(4)
Car and Truck Industries	-0.321	-0.494	-0.347	-0.622
	(-0.391)	(-0.571)	(-0.712)	(-1.123)
Firm controls	Yes	Yes	Yes	Yes
Observations	3857	3857	3857	3857
Adjusted R^2	0.0103	0.0063	0.0073	0.0031

Panel B: Independent Variable Defined by Toxic Releases

	Dep. Var. =			
	CAR(-3,0)	*CAR(-3,1)*	*CAR(-1,0)*	*CAR(-1,1)*
	(1)	(2)	(3)	(4)
High Δ *Toxic*	-0.308	-0.101	-0.200	-0.007
	(-1.119)	(-0.345)	(-1.056)	(-0.032)
Firm controls	Yes	Yes	Yes	Yes
Observations	563	563	563	563
Adjusted R^2	0.0168	0.0256	0.0315	0.0345

Notes. This table presents estimation results from ordinary least squares regressions of cumulative abnormal returns (CARs) on the motor vehicle manufacturing dummy. *CAR(t_1, t_2)* is cumulative abnormal returns estimated as the sum of daily abnormal returns based on the Fama-French five-factor model from day t_1 to t_2 with April 2, 2007 as the event date. *Car and Truck Industries* is an indicator variable taking the value of one if the firm belongs to motor vehicle manufacturing-related industries, including "Motor Vehicles and Passenger Car Bodies", "Truck and Bus Bodies", "Motor Vehicle Parts and Accessories", "Truck Trailers", "Motor Homes". *High* Δ *Toxic* is an indicator variable taking the value of one if a firm's Δ *Toxic* in 2006 is above the median among firms reporting to the EPA's TRI program and zero otherwise. Δ *Toxic* is the difference between the amount of total toxic releases in year *t* and *t*-1 scaled by the beginning-of-the-year sales. All regressions include firm-level controls, i.e., *Market-to-Book, ROA, Cash Holdings, Tangibility, Capital Expenditure, Market Leverage, Dividend Payout,* and *Firm Size*. Numbers in parentheses are *t*-statistics estimated from standard errors adjusted for heteroskedasticity. *, **, and ***, indicate statistical significance at the 10%, 5%, and 1% level, respectively. Detailed variable definitions are presented in Appendix B.