



Environmental Liabilities, Creditors, and Corporate Pollution: Evidence from the Apex Oil Ruling

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Fracking Firms Fail, Rewarding Executives and Raising Climate Fears

Oil and gas companies are hurtling toward bankruptcy, raising fears that wells will be left leaking planet-warming pollutants, with cleanup costs left to taxpayers.

A key issue: when a firm goes bankrupt, who pays for its environmental damages?



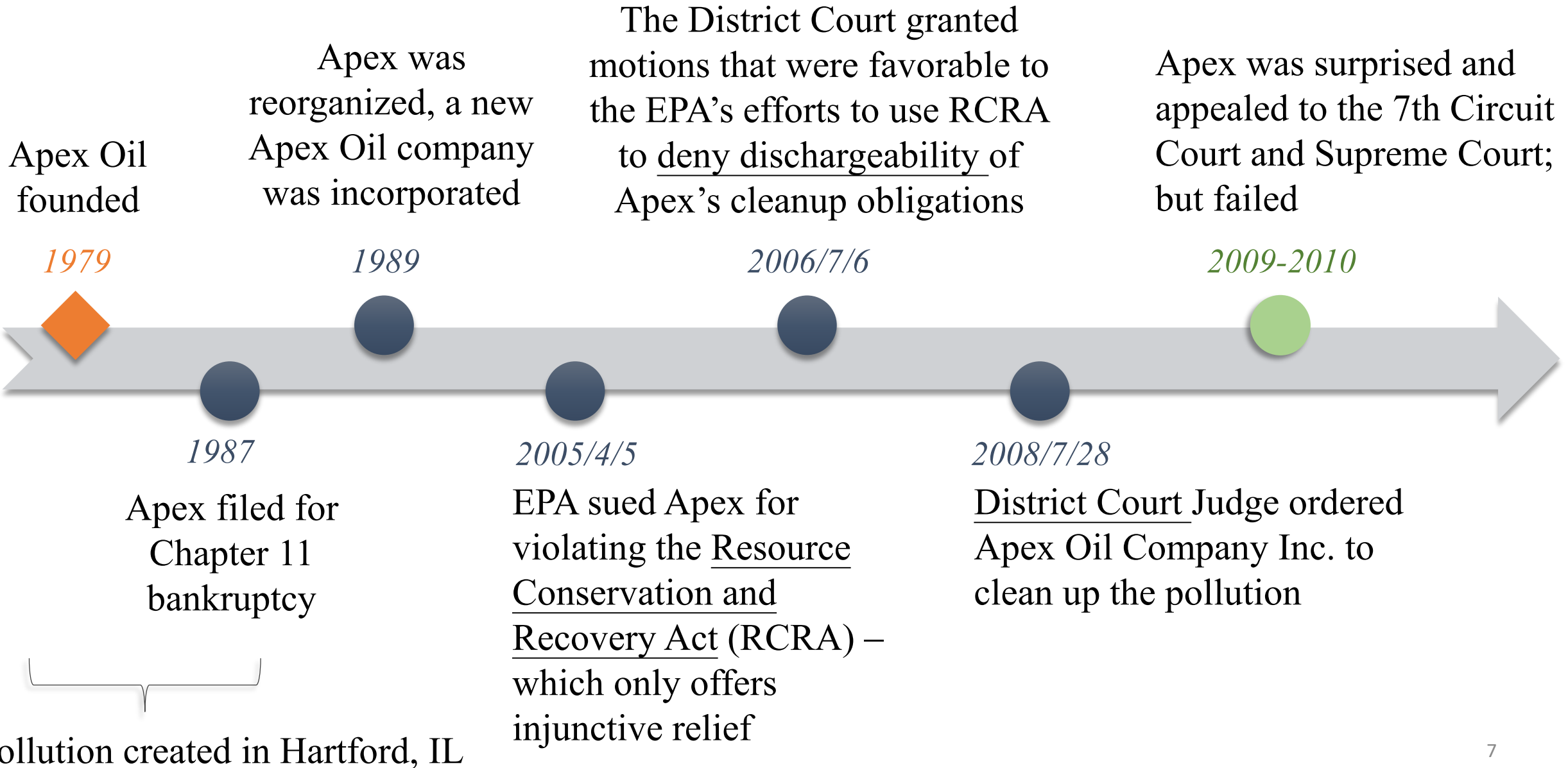
Dischargeability

- Key concept: dischargeability of environmental obligations.
- Chapter 11 allows financially distressed firms to reduce (i.e., “discharge”) claims such as debts. In a series of landmark cases (e.g., Ohio v. Kovacs (1985) and U.S. v. Whizco (1988)), the courts ruled that bankrupt firms’ obligations to clean up polluted sites were financial claims (i.e., debts) and were thus discharged in Chapter 11.
- If environmental liabilities are dischargeable, firms and their creditors will not fully internalize the social and environmental costs, which will be shifted to taxpayers in bankruptcy.
- Our research question: how does such dischargeability of environmental liabilities influence firms and creditors?

Apex Oil ruling in 2008

- In a pivotal and surprising decision—the **2008 Apex Oil ruling**, the courts materially **reduced** the dischargeability of environmental liabilities in Chapter 11 bankruptcy (Ohlrogge, 2020).
- We examine how the Apex Oil ruling/reduced dischargeability influenced corporate emissions
- We also highlight how the internalization of environmental liabilities influences the incentives and actions of credit providers (remaining values were first used to clean up those environmental obligations and only then used to settle creditor claims) and even corporate successor.

The timeline of Apex Oil ruling

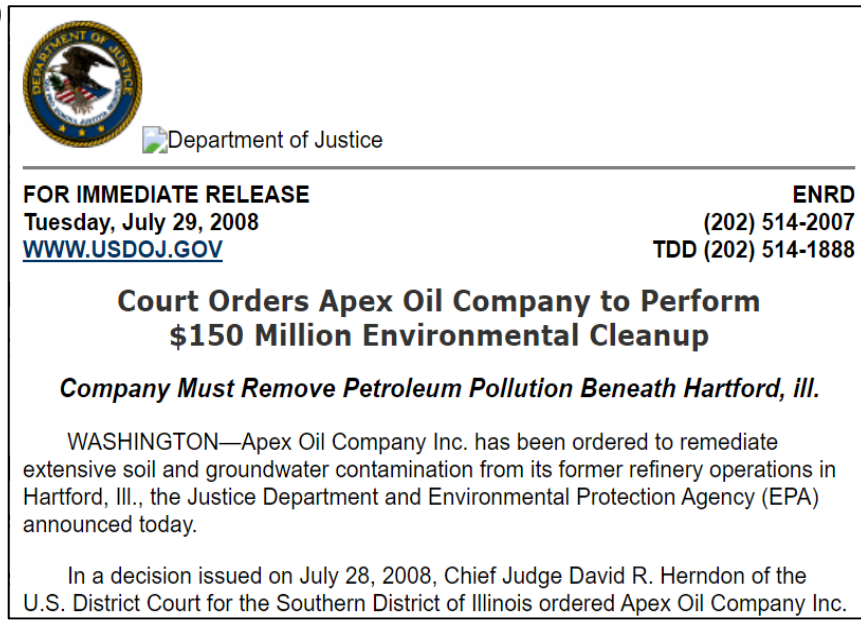


RCRA (Resource Conservation and Recovery Act)

- The RCRA's principal goal is to reduce hazardous waste generation so to reduce the current and future threat to human health and the environment.
- The RCRA creates a list of toxic chemicals (about 500)
- The RCRA does not entitle the plaintiff to demand payment instead of cleaning up the site; **it only allows the government to sue for an injunction to compel a cleanup.**
- Unlike other laws EPA used but failed before, RCRA is not primarily meant to seek for remedies and penalties (put it in a simple way -- **RCRA is not about “paying”**).
- The fact that RCRA does not mention payment mutes the dischargeability upon bankruptcy

The Apex Oil ruling has substantial impact

- The **Department of Justice** immediately releases news about the Apex after the District Court's decisions.
- The Apex Oil ruling is known to **lawyers**
 - There were more than two-dozen law firm client alerts addressing Apex (Ohlrogge, 2020).
- The Apex Oil ruling is cited by **other circuit courts'** rulings
 - In re Peabody Energy Corporation (958 F.3d 717, 8th Cir. 2020)
 - In re Kaiser Aluminum Corp. (386 Fed.Appx. 201, 3d Cir. 2010)
- The Apex Oil ruling is cited by **district courts'** rulings
 - In re Mark IV Industries, Inc. (459 B.R. 173 , 2011)
 - ...



- Match TRI with Compustat
 - Facility-level emission data come from the Toxics Release Inventory (TRI) provided by the U.S. Environmental Protection Agency (EPA) – mandatory disclosure
 - We match each facility in the TRI database to public firms in the Compustat using parent names and facility names.
- RCRA chemical
 - We identify which chemicals are governed by RCRA by using the EPA's Substance Registry Services website which provides chemicals information.
 - About half of TRI chemicals are covered by RCRA
- We form a chemical-facility-year panel from 2003-2013. Drop the year 2008.

Baseline regressions

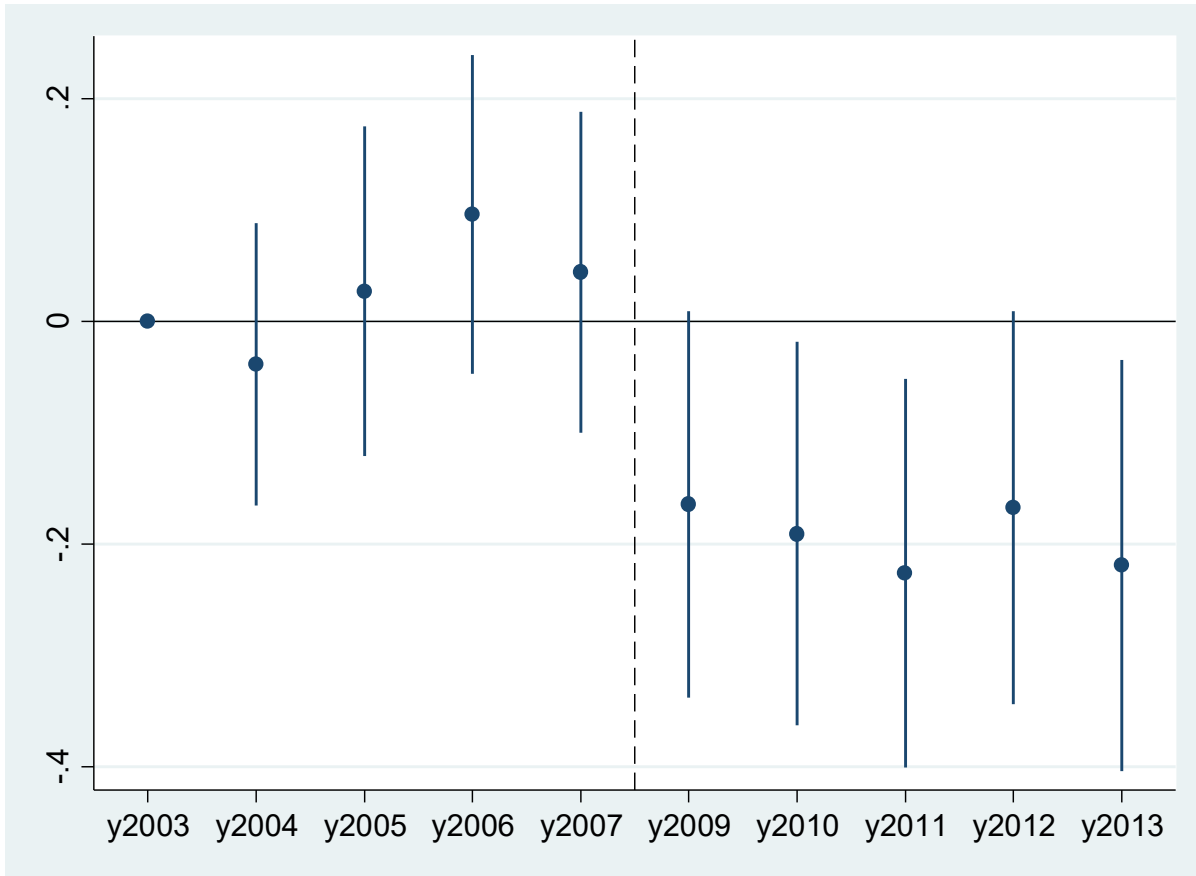
- $\ln(1 + RCRA\ Releases_{ict}) = \beta(Apex_t \times Heavy\ Polluters_i) + \alpha State_i \times t + \gamma Facility_i + \delta_1 I_{ct} + \delta_2 I_{kt} + \varepsilon$
- where i indexes facilities, c indexes chemicals, k indexes company, and t indexes years.
- The above equation was estimated in High and Low Default Prob. subsamples.

Variables	Definition
Ln(1+RCRA Releases)	Natural logarithm of one plus the pounds of facility i 's total RCRA water and land chemical releases (over 86% of total releases).
Apex	Apex equals one when year $t \geq 2009$ and set to zero otherwise
Heavy polluters	It equals one if facility i 's RCRA production wastes (total pollutants created) were larger than the industry (NAICS 3-digital code) median during the pre-Apex (2005-2007) period and zero otherwise.
High/Low Default Prob. subsample	High Default Prob. includes facilities belonging to firms with probability of failure (measured by Campbell et al., 2008) in December 2007 being larger than industry (NAICS 3-digital code) median. All other facilities are assigned to the Low Default Prob.

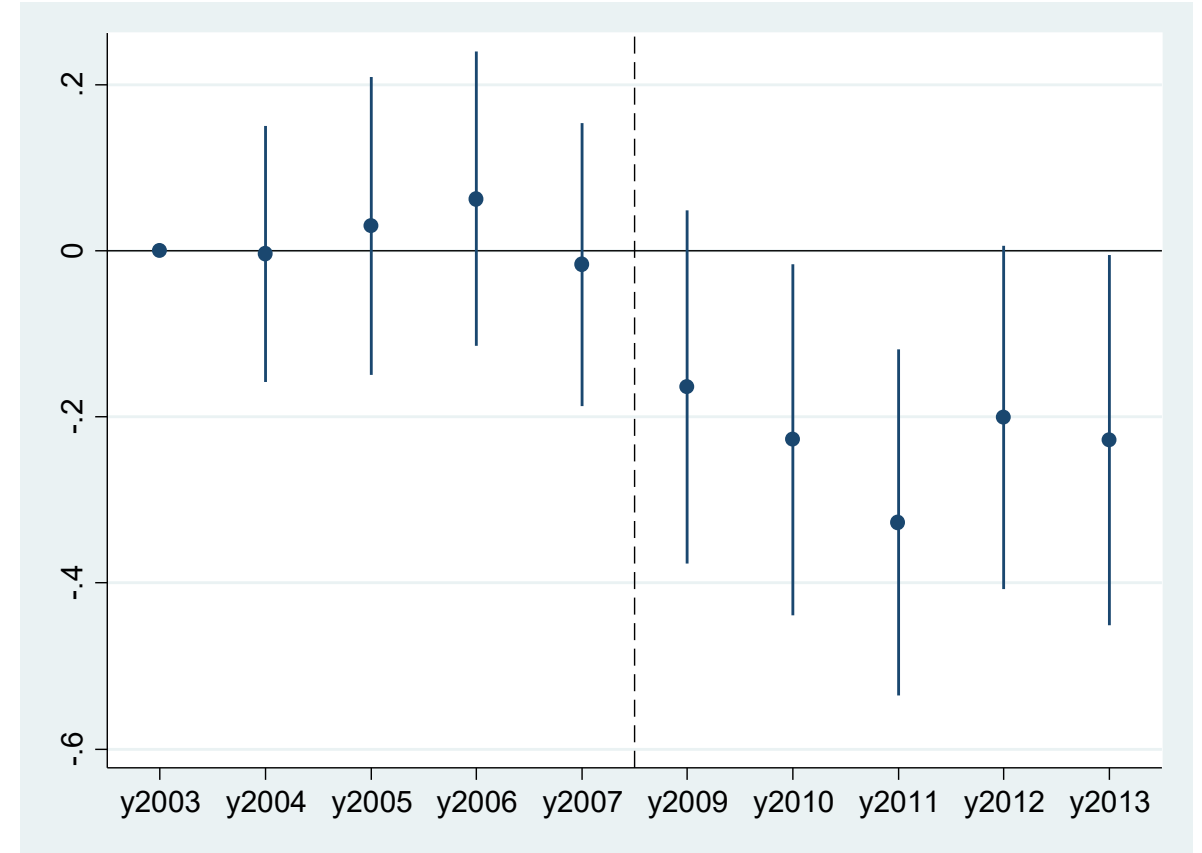
Table 2 Baseline results

Subsample	(1) High Default Prob.	(2) Low Default Prob.	(3) High Default Prob.	(4) Low Default Prob.
Dependent var.	Ln(1+RCRA Releases)	Ln(1+RCRA Releases)	Ln(1+RCRA Releases)	Ln(1+RCRA Releases)
Apex*Heavy Polluters	-0.2166*** (-3.1337)	-0.0649 (-0.9657)	-0.2396*** (-2.8112)	-0.0075 (-0.1064)
Constant	3.5951*** (6.2471)	2.6838*** (4.6061)	3.4573*** (12.2792)	3.2463*** (4.6110)
Observations	70,875	91,746	70,232	91,324
R-squared	0.750	0.729	0.759	0.736
State Time Trends	YES	YES	YES	YES
Facility FE	YES	YES	YES	YES
Chemical-Year FE	YES	YES	YES	YES
Fim-Year FE			YES	YES
High - Low Default Prob.		0.007***		0.000***

Figure 1 Parallel trend plots of baselines



Panel A. Table 2 Column (1) **High Default Prob.**



Panel B. Table 2 Column (3) **High Default Prob.**

- 95% confidence intervals

Table 3 The Placebo tests

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(1+Non-RCRA Releases)	Ln(1+Non-RCRA Releases)	Ln(1+Non-RCRA Releases)	Ln(1+Non-RCRA Releases)
Apex*Heavy Polluters	-0.0504 (-0.7066)	-0.0486 (-0.6436)	-0.1075 (-1.2308)	0.0716 (0.8003)
Constant	1.4900*** (8.0483)	1.2529*** (5.3299)	1.7621*** (8.0598)	1.2454*** (3.9994)
Observations	29,409	35,888	28,975	35,503
R-squared	0.658	0.645	0.671	0.657
State Time Trends	YES	YES	YES	YES
Facility FE	YES	YES	YES	YES
Chemical-Year FE	YES	YES	YES	YES
Parent-Year FE			YES	YES

Robustness and other tests

- Placebo test: no effect when we use non-RCRA-regulated releases
- Form a **chemical-firm-year panel** to address potential within-chemical transfers between facilities (Table IA10).
- Land releases of RCRA chemicals (Table IA1).
- Heavy Polluters based on RCRA total releases (Table IA2).
- Top 70th percentile RCRA production wastes as treated facilities (Table IA3).
- The standard error cluster at the state level or firm level (Table IA4).
- Expected default frequency based on Merton's (1974) distance to default model as an alternative default probability measurement (Table IA5).
- No reduction in facilities' production scale (facility employment) (Table IA6).
- Defining the treatment since 2009 (i.e., from 2010 onward, and zero before 2010.) (Table IA7)
- The omission of toxic releases (Table IA8, Table IA9).

Creditors' Interests and Incentives

Impact of the Apex Oil ruling on the following credit providers (because their values in liquidation will be hurt by increased environmental liabilities):

- CARs on bonds: reflects bondholders' wealth upon Apex ruling news
- Interest rates: reflects banks' interest rate in all debts
- Loan spreads: reflects banks' interest rate in newly issued debts

Creditors' Interests and Incentives : Bondholder wealth

Panel A. Value weighted				
Subsample	(1) High Default Prob.	(2) Low Default Prob.	(3) High Default Prob.	(4) Low Default Prob.
Dependent var.	CAR(-1,1)	CAR(-1,1)	CAR(-2,2)	CAR(-2,2)
Heavy polluter	-0.0442*** (-3.0641)	0.0049 (0.3920)	-0.0885** (-2.2997)	0.0163 (0.4803)
Constant	0.0315*** (2.8888)	-0.0034 (-0.3164)	0.0987*** (3.0523)	0.0263 (0.9858)
Observations	101	124	101	124
R-squared	0.087	0.001	0.054	0.002
Heavy polluters (High – Low)	0.003***		0.031**	

- Bond monthly returns. CARs are calculated using the 6-factor model.
- The event date is in July 2008, the District Court decision date of Apex.

Creditors' Interests and Incentives : Bondholder wealth

- For the $(-1, 1)$ and $(-2, 2)$ windows in Panel A columns (1) and (3), high default probability firms with relatively high exposure to the Apex Oil ruling experience negative abnormal bond returns ranging from **4.42% to 8.85%**.
- These estimates indicate that bondholders of an average heavy polluter with a high default probability, on average, suffer a total loss of **\$135** million during the 3-month event window and a total loss of **\$266** million during the 5-month event window.

Creditors' Interests and Incentives : The total interest rate

Subsample	(1)	(2)	(3)	(4)
Dependent var.	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
	Total Interest Rate	Total Interest Rate	Total Interest Rate	Total Interest Rate
Apex*Heavy polluter	0.0042** (2.2503)	0.0009 (0.6313)	0.0039** (2.1478)	0.0011 (0.7467)
Constant	0.0261*** (64.9191)	0.0198*** (50.2202)	0.0834 (1.5721)	0.0243 (1.1494)
Controls	NO	NO	YES	YES
Observations	2,603	2,824	2,603	2,824
R-squared	0.644	0.591	0.665	0.623
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Apex*heavy polluters (High – Low)		0.065*		0.089*

- **Total Interest Rate** is the total interest expense divided by total liabilities of a firm.

$$Total\ interest\ rate_{it} = \beta(Apex_t \times Heavy\ Polluters_i) + \gamma Control_{it} + \delta_1 I_i + \delta_2 I_t + \varepsilon$$

Creditors' Interests and Incentives : The total interest rate

- Taking the estimates from column (3), the total interest rate of heavy polluters with high default probabilities rises by **39 basis** points following Apex.
- This estimate implies that an average heavy polluter with a high default probability pays, on average, **\$52.30** million more in annual interest payments after the ruling, where average interest payments among such firms before Apex (2007) was \$466.80 million.

Creditors' Interests and Incentives : The bank loan spread

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(Loan Spread)	Ln(Loan Spread)	Ln(Loan Spread)	Ln(Loan Spread)
Apex*Heavy polluter	0.1673*	-0.0314	0.1707**	-0.0681
	(1.9498)	(-0.3572)	(2.1266)	(-0.8598)
Constant	4.9039***	4.4477***	6.7490***	5.8017***
	(247.9652)	(222.5948)	(7.5705)	(5.2694)
Controls	NO	NO	YES	YES
Observations	911	1,048	911	1,048
R-squared	0.801	0.833	0.815	0.850
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Apex*heavy polluters (High – Low)		0.062*		0.021**

- **Ln(Loan Spread)** is the natural logarithm of the basis point of firms' bank loan spread based on LIBOR.

What Did Treated Firms Do?

- Potential explanation 1: Reducing the production scale;
- Potential explanation 2: Investment in pollution abatement;
- Potential explanation 3: Developing greener production technologies.

Potential explanation 1: Adjustment of production scale

- The reduction in toxic releases may also result from downsizing production scale or switching polluting production among facilities rather than investing in green innovation or paying abatement costs.
- To empirically examine whether the reduction in toxic releases is related to the reduction of production scale or switch of production lines, we use the employment in facility level from NETS as the dependent variable.
- National Establishment Time-Series (NETS) database provided by Walls & Associates converting Dun and Bradstreet (D&B).

Table IA6 Facility employment

Subsample	(1)	(2)
Dependent var.	High Default Prob. Ln(Facility Emp)	Low Default Prob. Ln(Facility Emp)
Apex*Heavy Polluters	-0.0354 (-0.4274)	-0.1129 (-1.6120)
Constant	5.1482*** (19.0845)	6.4932*** (25.3211)
Observations	6,958	8,639
R-squared	0.911	0.900
State Time Trends	YES	YES
Facility FE	YES	YES
Parent-Year FE	YES	YES

Conclusion

- Our results highlight the effects on pollution reduction from assigning environmental liabilities on creditors (and successor firms).
- We add to the laws and economics literature by providing comprehensive evidence for the effectiveness of Apex ruling on internalizing pollution costs.
- We add to the finance literature by proving (and quantifying) the creditors' interest in environmental pollution



Thank You