Internet Appendix for
"Environmental Liabilities, Borrowing Costs, and Pollution Prevention Activities: the Nationwide Impact of the Apex Oil Ruling"

Jianqiang Chen Pei-Fang Hsieh Po-Hsuan Hsu Ross Levine

March 2023

A. Data and Matching details

A1. TRI database

Toxics Release Inventory (TRI) is a mandatory program. In order to notify the public about harmful chemical releases in their neighborhoods, the Congress passed the Emergency Planning and Community Right-to-Know Act (EPCRA) in 1986. Section 313 of EPCRA established TRI. TRI monitors the handling of certain hazardous compounds that might be dangerous to human health and the environment. The deadline for data submission is July 1st and activities for wastes management from the preceding calendar year are covered. The TRI reporting started with the 1987 reporting year (the first TRI report was on July 1st, 1988) and has continued to the present. Coverage became more comprehensive in 1991. As of August 2022, the TRI toxic chemical list contains 775 individual chemicals and 33 chemical categories The TRI listed chemicals are those that cause one or more of the following:

1. Cancer or other chronic human health effects.
2. Significant adverse acute human health effects.
3. Significant adverse environmental effects.

Facilities having 10 full-time equivalent employees (see 40 CFR 372.3) in different industries (e.g., manufacturing, mining, chemicals, utility and publishing)[1] in the U.S. are required to report annually on how many above threshold TRI-regulated compounds are released into the environment and how they are managed through recycling, energy recovery and treatment. TRI includes data about more than 21,000 facilities across the country.

Each TRI-reporting facility reports the production and ultimate outlets of each chemical (see: https://www.epa.gov/toxics-release-inventory-tri-program/common-tri-terms). "Production

[1] More industry information is available at: https://ordspub.epa.gov/ords/guideme_ext/f?p=guideme:gd:::::gd:naics_codes

wastes" denote the amount of all chemicals produced along with the production process. The outlets of these wastes include recycling, energy recovery, treatment, and releases. They are specified as follows:

- The recycling process uses a variety of methods, such as solvent recovery and metals recovery, to remove dangerous materials from waste. After being recycled, these chemicals may be utilized again at the facility or made available for use in commerce.
- Energy recovery refers to the situation in which chemical wastes are burned in an industrial furnace or boiler to produce heat or energy for usage within the plant.
- Treatment covers a number of techniques, including biological treatment, incineration, and chemical oxidation, by which harmful compounds in waste may be handled. The toxic chemical is often partially or completely destroyed using these methods.
- Releases are the various ways that hazardous substances from industrial facilities enter the air, water, and land. Releases can occur when substances are poured, pumped, poured, emitted, emptied, discharged, injected, escaped, leached, disposed of, or discharged into the environment. The terms "release," "emission," and "discharge" are all interchangeable in the TRI database.

The releases include air releases, water release, and land release, which are specified as follows:

- Air Releases include the following:
  - Point source (also called "stack emissions"): Air releases that take place through confined air streams, such as stacks, ducts or pipes.
  - Fugitive: Releases to air that do not occur through a confined air stream. Includes equipment leaks, releases from building ventilation systems and evaporative losses from surface impoundments and spills.
- Surface Water Discharges
  - This includes discharges to streams, rivers, lakes, oceans and other bodies of water. These discharges originated contained sources like open trenches or industrial process outflow pipes. Facilities must identify the name of each water body into which the TRI chemical is being discharged. Releases of TRI chemicals due to runoff, including stormwater runoff, are also reportable in this category.
- Land Releases

- This covers disposal of toxic chemicals in: (a) surface impoundments, which are open holding areas used to volatilize and/or settle waste materials; (b) underground injection wells, where fluids are injected below the lowest underground source of drinking water; (c) RCRA Subtitle C landfills, where wastes are buried; (d) other landfills, where wastes are buried.
- This also includes: (e) land treatment/application farming (management techniques in which a waste containing a TRI-listed chemical is applied to or incorporated into soil); (f) other land disposal methods (such as waste piles); and (g) other releases to land (such as spills or leaks).

A2. TRI matching with CRSP/Compustat

This section shows how we downloaded the TRI data and details of how to merge TRI with the CRSP/Compustat.

Step 1: We download the annual TRI data from the website: https://www.epa.gov/toxics-release-inventory-tri-program/tri-basic-data-files-calendar-years-1987-present. Our data was downloaded on 25th April 2020.

[Insert Figure IA1 here]

Step 2: We use "PARENT CO NAME" in the TRI database as the name of the owner of facilities. If "PARENT CO NAME" is not available, we use "FACILITY NAME" to match.

[Insert Figure IA2 here]

Step 3: We clean special characters, capitalize all names and standardize the suffixes of the TRI and CRSP/Compustat firms' names. For example, we convert "CORPORATION" to "CORP", "INDUSTRY" to 'IND", and "GROUP" to "GRP" etc.

Step 4: We use the SAS "compged()" function (the fuzzy name-matching algorithm) for the matching of TRI and CRSP/Compustat names. The "compged()" function could return the matching score (edit distance) between two strings.[2] If two strings are the same, the matching score is 0. Any differences between the two strings would increase the matching score. To make the match more efficient, we first make sure that the initials of names in TRI and CRSP/Compustat

[2] See: https://documentation.sas.com/doc/en/pgmsascdc/9.4_3.2/lefunctionsref/p1r4l9jwgatggtn1ko81fyjys4s7.htm

are the same and then calculated the edit distance. We keep outputs that the matching score is no more than 500 and we obtain a pool of matches.

Step 5: We hire research assistants to check the name manually from the output file, by checking the matching score, googling the names, and checking firms' homepages, to see if the two names are of the same firm. Figure A3 shows some examples of the manual match. We also make double checks and make a few matches not in our match outputs, e.g., "IBM CORP" vs. "INTERNATIONAL BUSINESS MACHS COR".

[Insert Figure IA3 here]

A3. RCRA chemicals and matching details

The Resource Conservation and Recovery Act (RCRA), passed in 1976, regulations establish solid waste management standards. These standards are found in title 40 of the Code of Federal Regulations (CFR), parts 239 through 282. Materials covered by RCRA are called "Solid Wastes". "Solid Waste" includes wasted materials that come from industrial, commercial, mining, agricultural, and community activities et al. It is important to highlight that "Solid Waste" does not only refer to physically solid waste. Many solid wastes contain gas, liquid, or semi-solid components.

Solid wastes can be divided into non-hazardous solid wastes (Subtitle D of the Act and Title 40 of the CFR parts 239 through 259 of the regulations) and hazardous solid wastes (Subtitle C of the Act and title 40 CFR parts 260 through 273 of the regulations). In this study, we focus on hazardous solid wastes. Chemicals in RCRA Hazardous Waste List (40 CFR 261) must be appropriately managed and disposed from the moment it is generated to its final disposal (cradle-to-grave).

This rest part of this section of the Internet Appendix shows the details of how we screened out the RCRA hazardous chemicals in the TRI.

Step 1: Open the EPA's Substance Registry Services website:

https://ofmpub.epa.gov/sor_internet/registry/substreg/LandingPage.do

[Insert Figure IA4 here]

Step 2: In the middle of the page, next to "Browse by chemical/substance list", enter "RCRA". Then we could download all RCRA hazardous chemical files.

[Insert Figure IA5 here]

Step 3: Using Chemical Abstract Service (CAS) compound IDs, we retrieve RCRA-regulated toxic releases in the TRI database. The CAS compound IDs in the RCRA chemical files could be matched to the CAS IDs in the TRI database. In most cases, they are perfectly matched.

[Insert Figure IA6 here]

Step 4: In a few situations, the compounds in the TRI database are characterized in a more general way, such as "BERYLLIUM COMPOUNDS" with CAS ID N050 in TRI. If the underlying element, for instance, "BERYLLIUM" is in the RCRA chemical list, then we include "BERYLLIUM COMPOUNDS" in RCRA chemicals (Ohlrogge, 2020). In this example, "BERYLLIUM COMPOUNDS" in TRI is classified as RCRA compound.

[Insert Figure IA7 here]

A4. Pollution Prevention (P2) database

According to the Pollution Prevention Act (P2 Act), which the Congress approved in 1990, the EPA is authorized to gather and disseminate information on pollution prevention activities (also known as source reduction activities). Facilities covered in the TRI are also required to document new source reduction activities at the chemical level in the year that they are started or fully implemented. These newly implemented source reduction activities are supposed to reduce, eliminate, or prevent hazardous substances before entering the waste stream.

P2 approaches can be applied to all potential or actual pollution-generating activities especially for preserving wetlands, groundwater and critical ecosystems areas which focus on water and land preventively pollution reduction. Figure IA8 displays the EPA Waste Management Hierarchy. The upper layer "source reduction" is the most fundamentally feasible and desirable because it is more cost effective to prevent pollution from reducing its source than paying for recycling, treatment or disposal. When less pollution is made, the greater positive impact on human health and environment.

[Insert Figure IA8 here]

When reporting P2, facilities should select one or more predefined codes (W-codes) that describe specific practices within the eight categories. The list of categories and codes is provided

in Table IA1 in the Internet Appendix by following Toxic Chemical Release Inventory Reporting Forms and Instructions, Revised 2020 Version.[3]

[Insert Table IA1 here]

We use the EPA's Pollution Prevention (P2) database to analyze pollution prevention activities. The steps we take to construct the data are as follows:

Step 1: We download data from the website: https://www.epa.gov/toxics-release-inventory-tri-program/tri-basic-plus-data-files-calendar-years-1987-present. Our data was downloaded on December 31st, 2021.[4]

[Insert Figure IA9 here]

Step 2: The data is in a zip file, and we use the file "US_2a" which includes facilities' source reduction activities.

Step 3: We then keep variables of "FIRST SOURCE REDUCTION ACTIVITY CODE", "SECOND SOURCE REDUCTION ACTIVITY CODE", "THIRD SOURCE REDUCTION ACTIVITY CODE" and "FOURTH SOURCE REDUCTION ACTIVITY CODE".

Step 4: We count the number of first to fourth source reduction activity codes (W-codes) for each facility in each year.

B. Robustness Tests for Bond and Stock CARs

Table IB1 illustrates that the results remain consistent for the monthly bond CARs when we assign firm *i* to either one specific circuit if 80% or more of its total production wastes during the pre-Apex period (2003-2007) are in a specific circuit.

Similarly, Table IB2 displays the validity of the outcomes concerning the daily stock CARs when we assign firm *i* to either one specific circuit if 80% or more of its total production wastes during the pre-Apex period (2003-2007) are in a specific circuit.

C. Robustness Tests for Total Interest Rates

Table IC1 shows that the results hold by using Merton's (1974) distance to default model to measure default probabilities.

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[3] Available at:https://ordspub.epa.gov/ords/guideme_ext/guideme/file/ry_2020_rfi.pdf

[4] This data also contains the DUNS number for the facility level and can be used to connect to NETS.

Table IC2 shows that the results are robust to defining $Heavy\ RCRA\ Polluters_i$ using tercile ranks, such that firms are given a rank of one if they are in the lowest tercile of pre-*Apex* (2003–2007) accumulated RCRA toxic wastes in their industry.

Table IC3 shows the results hold when using a longer pre-*Ape*x period (2000-2007) to define $Heavy\ RCRA\ Polluters_i$.

Table IC4 (IC5 or IC6) shows the results are robust to excluding firms in the Seventh (Sixth or Third) Circuit.

Table IC7 shows the results hold when using a triple-difference specification rather than splitting the sample between high and low default probability firms.

Tables IC8, IC9, and IC10 show the results are robust to using either *Ln(1+Total interest rate)*, *Total interest rate*, or *Ln(total amount of interest expenses)* as the dependent variable, respectively. *Ln(1+Total interest rate*) is the natural logarithm of one plus the total interest rate.

Table IC11 shows that the results are robust to using August 2009, when the Seventh Circuit upheld the District Court decision, as the *Ape*x treatment date, rather than the District Court's decision in July 2008.

D. Robustness Tests for Bank Loan Spreads

Table ID1 shows that the results hold by using Merton's (1974) distance to default model to measure default probabilities.

Table ID2 shows that the results are robust to defining $Heavy\ RCRA\ Polluters_i$ using tercile ranks, such that firms are given a rank of one if they are in the lowest tercile of pre-*Apex* (2003–2007) accumulated RCRA toxic wastes in their industry.

Table ID3 shows the results hold when using a longer pre-*Ape*x period (2000-2007) to define $Heavy\ RCRA\ Polluters_i$.

Table ID4 (ID5 or ID6) shows the results are robust to excluding firms in the Seventh (Sixth or Third) Circuit.

Table ID7 shows the results hold when using a triple-difference specification rather than splitting the sample between high and low default probability firms.

Tables ID8 and ID9 show the results are robust to using alternative loan spread measures as the dependent variable. Table ID8 reports the results using *Ln(1+Loan Spread)*, which equals the natural logarithm of one plus loan spreads. We then convert Ln(1+ *Loan Spread*) to basis points

by multiplying by 10,000 to enhance interpretation of the coefficient estimates. Table ID9 reports the results using loan spreads times 10,000 as the dependent variable i.e., we do not take the natural logarithm.

Table ID10 examines the relationship between *Apex* and non-price contract terms (loan maturity). We calculate a firm's weighted average loan maturity based on loans and then take the natural logarithm. We find that loan maturity falls by around 10% after *Apex*.

Table ID11 shows that the results are robust to using August 2009, when the Seventh Circuit upheld the District Court decision, as the *Apex* treatment date, rather than the District Court's decision in July 2008.

E. Robustness Tests for Pollution Prevention

Table IE1 shows that the results hold when using Merton's (1974) distance to default model to measure default probabilities.

Table IE2 shows that the results are robust to defining $Heavy\ RCRA\ Polluters_i$ using tercile ranks, such that firms are given a rank of one if they are in the lowest tercile of pre-*Apex* (2003–2007) accumulated RCRA toxic wastes in their industry.

Table IE3 reports the results when using a longer pre-*Apex* period (2000-2007) to define $Heavy\ RCRA\ Polluters_i$.

Table IE4 (IE5 or IE6) shows the results are robust to excluding firms in the Seventh (Sixth or Third) Circuit.

Table IE7 shows the results hold when using a triple-difference specification rather than splitting the sample between high and low default probability firms.

Table IE8 shows the results are robust to clustering at the state level to account for correlation in the standard errors of facilities in the same state and clustering at the firm level.

F. Robustness Tests for Toxic Emissions

Table IF1 shows that the results hold when using Merton's (1974) distance to default model to measure default probabilities.

Table IF2 shows that the results are robust to defining $Heavy\ RCRA\ Polluters_i$ using tercile ranks, such that firms are given a rank of one if they are in the lowest tercile of pre-*Apex* (2003–2007) accumulated RCRA toxic wastes in their industry.

Table IF3 shows the results hold when using a longer pre-*Ape*x period (2000-2007) to define $Heavy\ RCRA\ Polluters_i$.

Table IF4 (IF5 or IF6) shows the results are robust to excluding firms in the Seventh (Sixth or Third) Circuit.

Table IF7 shows the results hold when using a triple-difference specification rather than splitting the sample between high and low default probability firms.

Table IF8 shows that our main results are robust to using the natural logarithm of one plus land toxic releases (rather than all non-air releases) as the dependent variable.

Table IF9 shows that the results are robust to using August 2009, when the Seventh Circuit upheld the District Court decision, as the *Ape*x treatment date, rather than the District Court's decision in July 2008.

Table IF10 shows the results are robust to using an alternative estimation strategy. First, we divide the sample into heavy RCRA polluters and light RCRA polluters subsamples using the industry median (rather than splitting the sample by default probabilities). Then we define the treatment group based on firms' probability of failure (rather than differencing by heavy and non-heavy RCRA polluters): facilities' parent firms with a higher probability of failure would be the treatment group.

Table IF11 shows the results are robust to clustering at the state level to account for correlation in the standard errors of facilities in the same state and clustering at the firm level.

Tables IF12 and IF13 address concerns that nonrandom noncompliance with TRI reporting requirements related to the Apex Oil decision shaped the findings. Table IF12 shows that the results hold when replacing missing values with zeros when (a) a facility reports a missing value for an RCRA toxic chemical release in years t to t+2 and (b) that same facility reported a non-missing for that chemical in years t-*1* and t+*3*. Table IF13 shows the results hold when only including firms that report non-missing values for an RCRA chemical throughout each year of the sample.

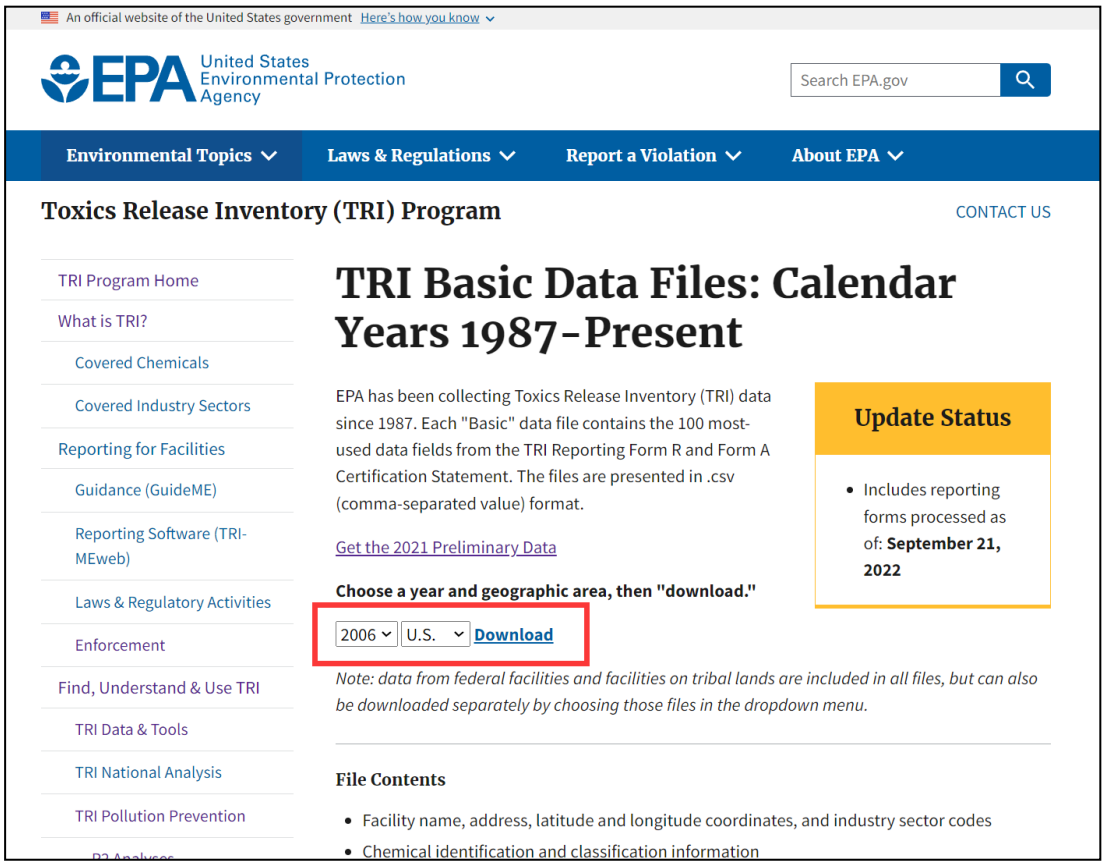
Table IF14 shows the results hold when aggregating observations at facility level and conducting the difference-in-differences estimation using this facility-year panel.

Table IF15 shows the results hold when aggregating facilities' RCRA Non-air Toxic Releases to the firm level and conducting the difference-in-differences estimation using this firm-

chemical-year panel. These results reduce concerns the results are driven by *Apex* triggering within-chemical transfers between facilities of the same firm.

Table IF16 presents the results hold after applying the inverse hyperbolic sine transformation ($f(x) = ln\,(x + \sqrt{1 + x^2})$) to our data. The natural logarithm plus one transformation changes the way we interpret the results of a log-level regression. To avoid any potential impact on our results, we use the inverse hyperbolic sine transformation (Burbidge, Magee, and Robb 1988) on the total releases. Our results remain consistent.

Figure IA1 Download TRI data



Source: https://www.epa.gov/toxics-release-inventory-tri-program/tri-basic-data-files-calendar-years-1987-present

Figure IA2 TRI variables used to match

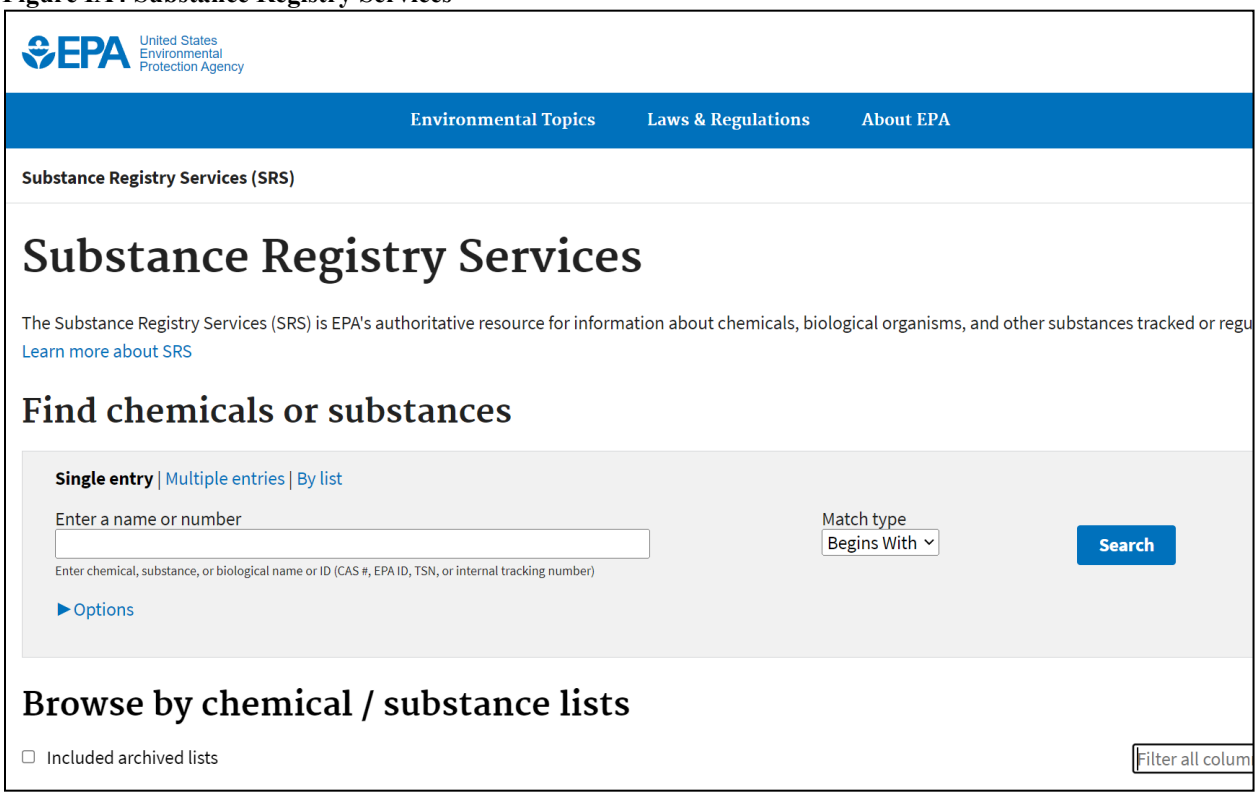
	parentconame	facilityname
1	NA	MESA PRODUCTS INC
2	THE GOODYEAR TIRE & RUBBER CO	GOODYEAR TIRE & RUBBER CO
3	NA	ALLIED MINERAL PRODUCTS INC
4	CATERPILLAR INC	SOLAR TURBINES INC KEARNY MESA
5	DENTSPLY SIRONA	DENTSPLY PROSTHETICS US LLC
6	HYDRO ALUMINUM METALS USA LLC	HYDRO ALUMINUM
7	HYDRO ALUMINUM METALS USA LLC	HYDRO ALUMINUM
8	VALERO ENERGY CORP	PREMCOR ALSIP DISTRIBUTION CENTER
9	MCC DEVELOPMENT CORP	NEVADA READY MIX LONE MOUNTAIN
10	CARGILL INC	CARGILL SALT
11	DEER PARK REFINING LP	DEER PARK REFINING LP
12	DEER PARK REFINING LP	DEER PARK REFINING LP
13	DEER PARK REFINING LP	DEER PARK REFINING LP
14	BARNES GROUP INC	BARNES AEROSPACE - LANSING DIV
15	EXXON MOBIL CORP	EXXONMOBIL BATON ROUGE CHEMICAL PLANT (PART)
16	EXXON MOBIL CORP	EXXONMOBIL BATON ROUGE CHEMICAL PLANT (PART)
17	MINAFIN SARL	PENNAKEM LLC
18	COMMERCIAL METALS CO	CMC REBAR
19	NA	AMES FIRE & WATERWORKS
20	DSM HOLDING CO USA INC	DSM NUTRITIONAL PRODUCTS
21	KHH INC	CHEMEX INC
22	CHS INC	CHS INC LAUREL REFINERY
23	CHS INC	CHS INC LAUREL REFINERY

Figure IA3 Match examples

"TRI_name" ("pub_name") is the standardized name from TRI (CRSP/Compustat). "matching score" is the matching score generated by SAS.

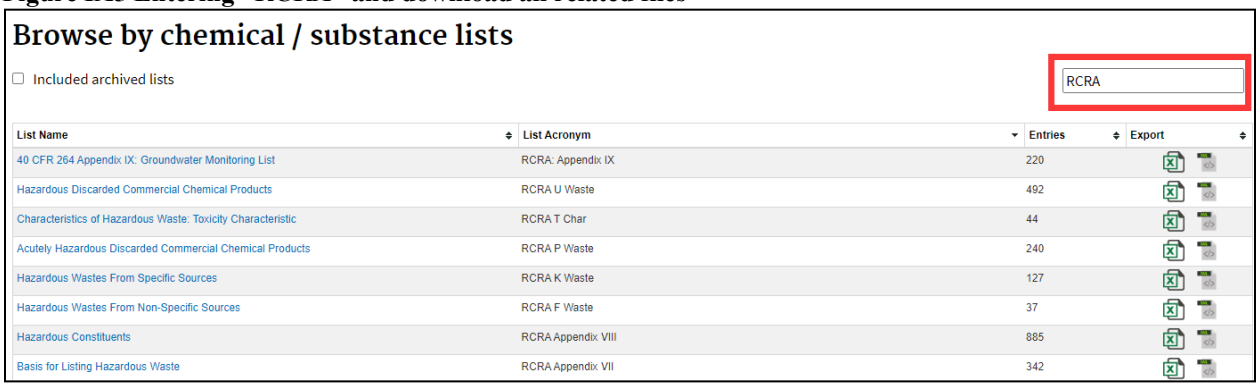
PARENT_COMPANY_NAME	TRI_name	pub_name	matching score	score_ran	Match	reason
1ST AYD CORP	1ST AYD CORP	1ST BANCORP	310	1		wms is high and they are not same
3COM CORP	3COM CORP	3COM CORP	0	1	1	yes, they are exactly same
3M	3M	3M CO	30	1	1	low wms, they are same.
3M CO INC	3M CO INC	3M CO	160	1	1	relatively low wms, they are same.
A & L LABORATORIES INC	A L LAB INC	A L LABS INC	110	1	1	relatively low wms, they are same.
ACTION MANUFACTURING CO	ACTION MFGCO	ACTION PLC	350	1		High wms and although they both have 'ACTION', they are totally different when googling both names.

Figure IA4 Substance Registry Services



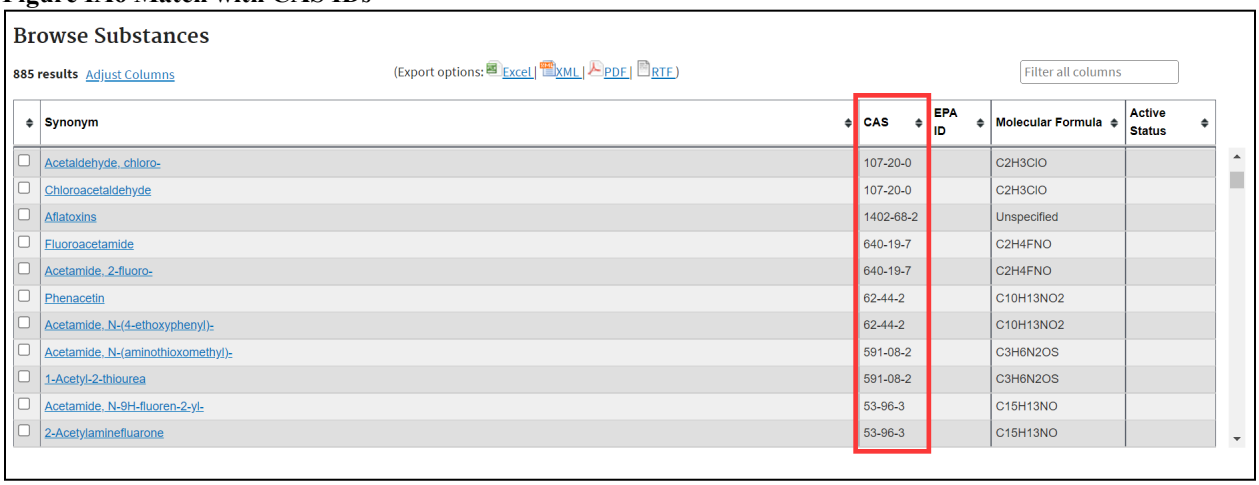
Source: https://sor.epa.gov/sor_internet/registry/substreg/LandingPage.do

Figure IA5 Entering "RCRA" and download all related files



Source: https://sor.epa.gov/sor_internet/registry/substreg/LandingPage.do

Figure IA6 Match with CAS IDs



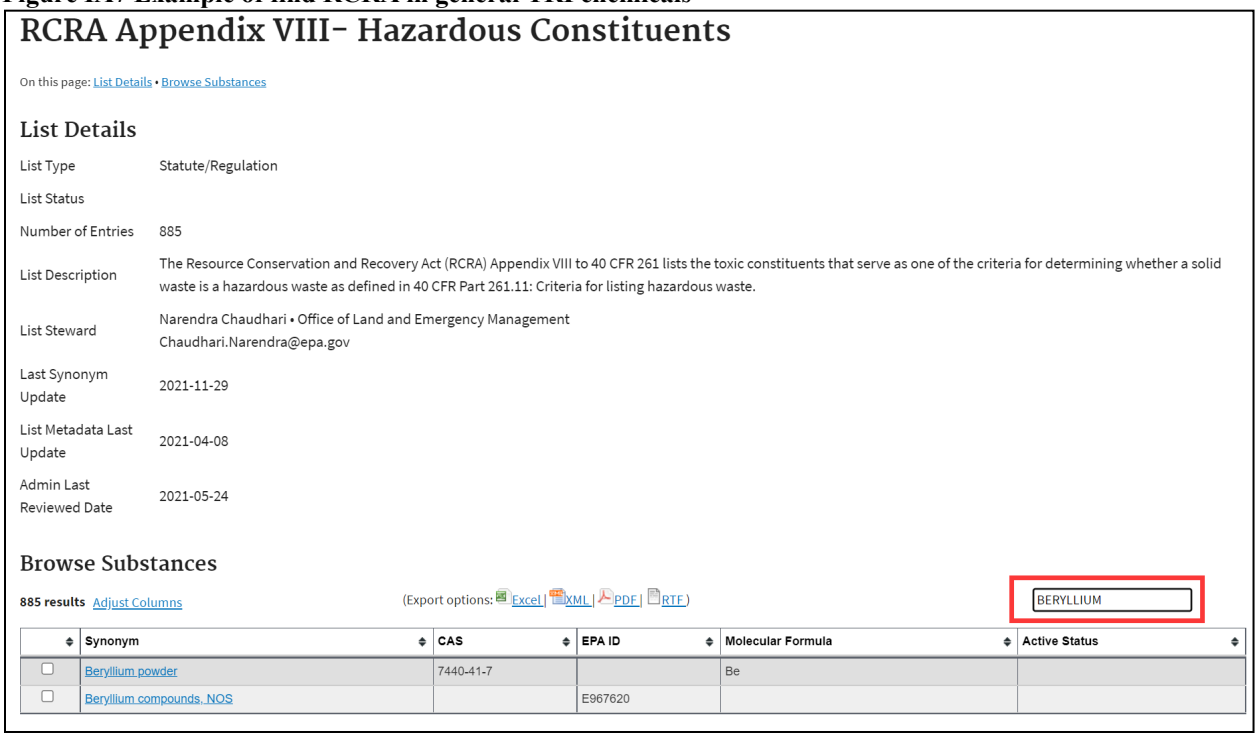
Browse Substances

885 results Adjust Columns (Export options: Excel | XML | PDF | RTF) Filter all columns

Synonym	CAS	EPA ID	Molecular Formula	Active Status
Acetaldehyde, chloro-	107-20-0		C2H3ClO	
Chloroacetaldehyde	107-20-0		C2H3ClO	
Aflatoxins	1402-68-2		Unspecified	
Fluoroacetamide	640-19-7		C2H4FNO	
Acetamide, 2-fluoro-	640-19-7		C2H4FNO	
Phenacetin	62-44-2		C10H13NO2	
Acetamide, N-(4-ethoxyphenyl)-	62-44-2		C10H13NO2	
Acetamide, N-(aminothioxomethyl)-	591-08-2		C3H6N2OS	
1-Acetyl-2-thiourea	591-08-2		C3H6N2OS	
Acetamide, N-9H-fluoren-2-yl-	53-96-3		C15H13NO	
2-Acetylaminefluarone	53-96-3		C15H13NO	

Source: https://sor.epa.gov/sor_internet/registry/substreg/LandingPage.do

Figure IA7 Example of find RCRA in general TRI chemicals



RCRA Appendix VIII– Hazardous Constituents

On this page: List Details • Browse Substances

List Details

List Type	Statute/Regulation
List Status	
Number of Entries	885
List Description	The Resource Conservation and Recovery Act (RCRA) Appendix VIII to 40 CFR 261 lists the toxic constituents that serve as one of the criteria for determining whether a solid waste is a hazardous waste as defined in 40 CFR Part 261.11: Criteria for listing hazardous waste.
List Steward	Narendra Chaudhari • Office of Land and Emergency Management Chaudhari.Narendra@epa.gov
Last Synonym Update	2021-11-29
List Metadata Last Update	2021-04-08
Admin Last Reviewed Date	2021-05-24

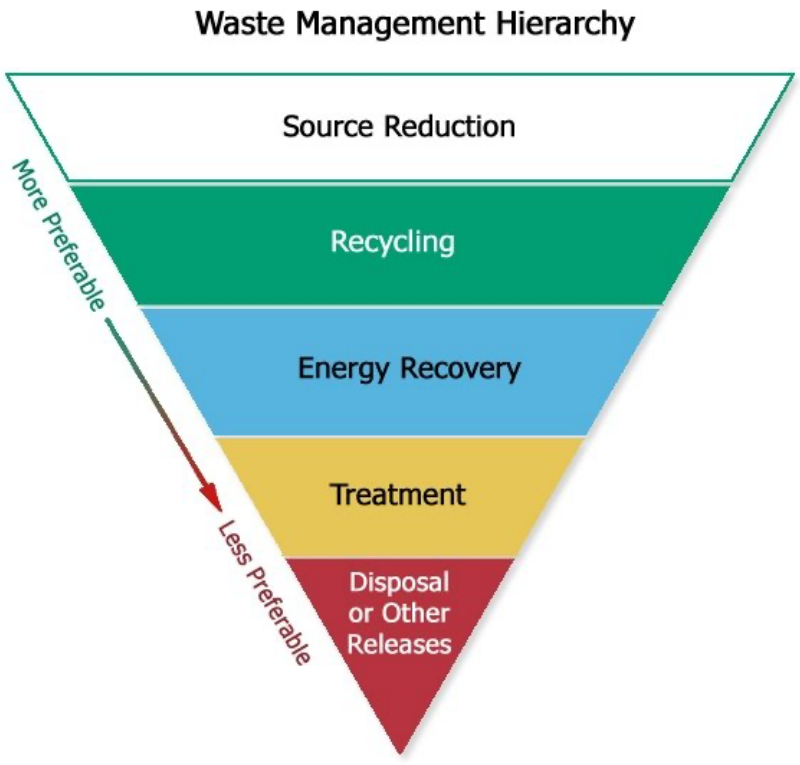
Browse Substances

885 results Adjust Columns (Export options: Excel | XML | PDF | RTF) BERYLLIUM

Synonym	CAS	EPA ID	Molecular Formula	Active Status
Beryllium powder	7440-41-7		Be	
Beryllium compounds, NOS		E967620		

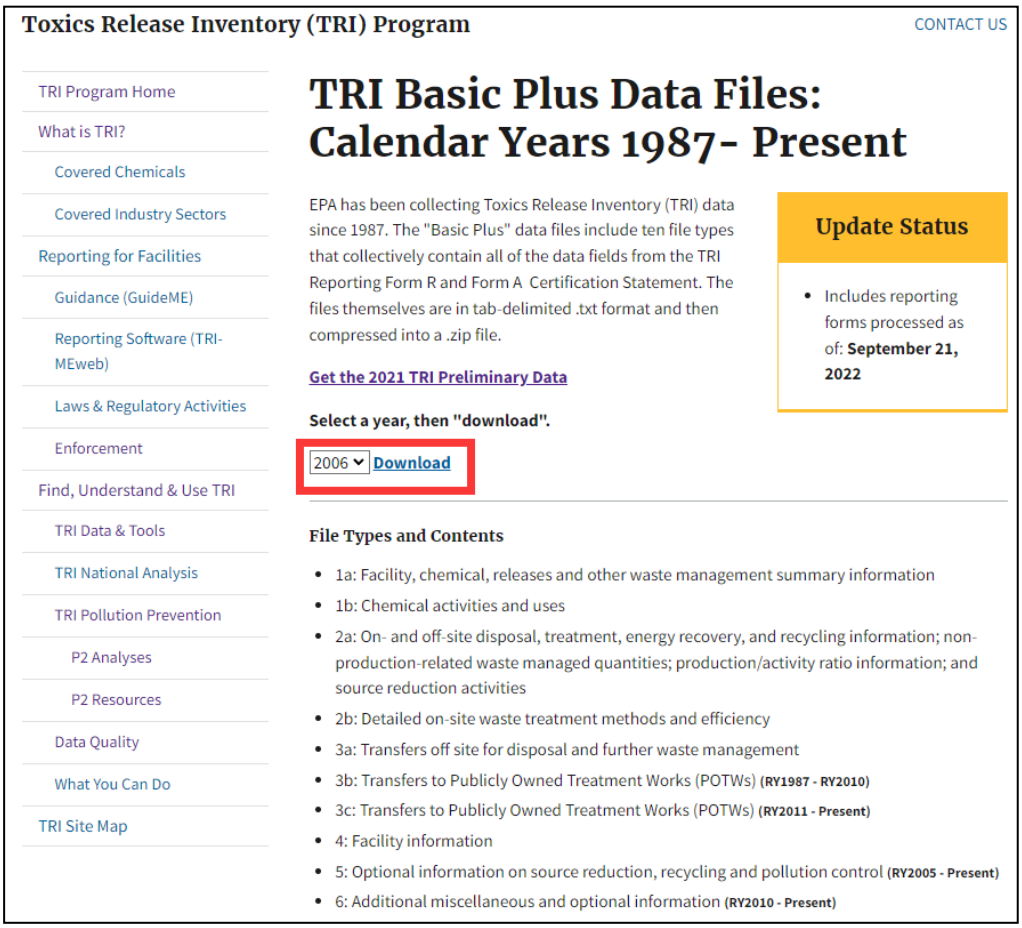
Source: https://sor.epa.gov/sor_internet/registry/substreg/LandingPage.do

Figure IA8 Waste Management Hierarchy



Source: https://www.epa.gov/trinationalanalysis/pollution-prevention-and-waste-management

Figure IA9 Download TRI Plus data



Source: https://www.epa.gov/toxics-release-inventory-tri-program/tri-basic-plus-data-files-calendar-years-1987-present

Table IA1 Source reduction activities

Source reduction category	Definition	Codes
Raw Material Modifications	refer to changing input dimensions or purity, or completely replacing a feedstock, reagent, or other substance with less toxic or otherwise environmentally preferable alternatives.	W41 Increased purity of raw materials W42 Substituted raw materials W43 Substituted a feedstock or reagent chemical with a different chemical W49 Other raw material modifications made
Product Modifications	refer to changing the end product through design, composition, formulation, or packaging changes, as well as full final product replacements that improve overall environmental impact.	W81 Changed product specifications W82 Modified design or composition of product W83 Modified packaging W84 Developed a new chemical product to replace a previous chemical product W89 Other product modifications made
Cleaning and Degreasing	refer to processes that remove material from a surface or substrate including cleaning, polishing, rinsing, stripping, draining, and degreasing practices or equipment.	W59 Modified stripping/cleaning equipment W60 Changed to mechanical stripping/cleaning devices (from solvents or other materials) W61 Changed to aqueous cleaners (from solvents or other materials) W63 Modified containment procedures for cleaning units W64 Improved draining procedures W65 Redesigned parts racks to reduce drag out W66 Modified or installed rinse systems W67 Improved rinse equipment design W68 Improved rinse equipment operation W71 Other cleaning and degreasing modifications made
Surface Preparation and Finishing	refers to processes that add material to a surface or substrate including powder coating, paint application, fabric coating, as well as metal surface treatments such as galvanizing and electroplating.	W72 Modified spray systems or equipment W73 Substituted coating materials used W74 Improved application techniques W75 Changed from spray to other system W78 Other surface preparation and finishing modifications made
Process Modifications	refer to improvements to industrial processes and/or associated equipment including implementation of new processes	W50 Optimized reaction conditions or otherwise increased efficiency of synthesis W51 Instituted re-circulation within a process W52 Modified equipment, layout, or piping

	that produce less waste, direct reuse of chemicals, or technological changes impacting synthesis, formulation, fabrication, and assembly.	W53 Used a different process catalyst W54 Instituted better controls on operating bulk containers to minimize discarding of empty containers W55 Changed from small volume containers to bulk containers to minimize discarding of empty containers W56 Reduced or eliminated use of an organic solvent W57 Used biotechnology in manufacturing process W58 Other process modifications made
Spill and Leak Prevention	refers to improvements to monitoring programs, equipment inspection, material storage and containment, and material handling that avert chemical spills, fugitive emissions, evaporative losses, and leaks during operations.	W31 Improved storage or stacking procedures W32 Improved procedures for loading, unloading, and transfer operations W33 Installed overflow alarms or automatic shut-off valves W35 Installed vapor recovery systems W36 Implemented inspection or monitoring program of potential spill or leak sources W39 Other changes made in spill and leak prevention
Inventory Control	refers to practices that promote more efficient storage and management of chemical and materials through labeling, material testing, inventory tracking, and changes to volumes or quantities of materials procured.	W21 Instituted procedures to ensure that materials do not stay in inventory beyond shelf-life W22 Began to test outdated material—continue to use if still effective W23 Eliminated shelf-life requirements for stable materials W24 Instituted better labeling procedures W25 Instituted clearinghouse to exchange materials that would otherwise be discarded W29 Other changes made in inventory control
Good Operating Practices	refer to improvements in maintenance, production scheduling, product quality monitoring, and other practices that enhance operator expertise and housekeeping measures that eliminate or minimize waste.	W13 Improved maintenance scheduling, record keeping, or procedures W14 Changed production schedule to minimize equipment and feedstock changeovers W15 Introduced in-line product quality monitoring or other process analysis system W19 Other changes made in operating practices

Source: Toxic Chemical Release Inventory Reporting Forms and Instructions, Revised 2020 Version.
Available at:https://ordspub.epa.gov/ords/guideme_ext/guideme/file/ry_2020_rfi.pdf

Table IB1 Bond price reaction – 80% threshold

This table reports regression results evaluating how the cumulative abnormal returns (CARs) on firms' bond respond to *Apex*. The dependent variable is the CAR of each firm's bond over the (-1,1) month event window surrounding the July 2008 District Court Apex decision. The analysis employs the four-factor model developed by Bai, Bali, and Wen (2019) to calculate monthly bond CARs. The estimation period spans 9 months, with a gap of 1 month preceding the event window. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (SIC 2-digital code) median and zero otherwise. *Seventh Cir.* (*Sixth Cir.* or *Third Cir.*) indicates that firm *i*'s RCRA production wastes during the pre-Apex (2003-2007) period in the Seventh Circuit (Sixth Cir. or Third Cir.) over total production wastes were larger than 80%. The analysis includes two subsamples: High Default Probability firms, which are firms with above-median levels of Campbell et al. (2008) failure probabilities relative to other firms in their industries, and Low Default Probability firms. Regressions (1), (3) and (5) include the High Default Probability subsample, while regressions (2), (4) and (6) include the Low Default Probability subsample. The table also reports the results of tests of the hypothesis that the coefficient estimates on Heavy Polluters for the High-Low Default probability subsamples are equal. Detailed variable definitions can be found in Appendix A. We report t-statistics based on robust standard errors in parentheses. Based on the estimated coefficient p-values (p), * denotes p < 0.1, ** denotes p < 0.05, and *** denotes p < 0.01.

	(1)	(2)	(3)	(4)	(5)	(6)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	CAR(-1,1)	CAR(-1,1)	CAR(-1,1)	CAR(-1,1)	CAR(-1,1)	CAR(-1,1)
Heavy RCRA Polluters	-0.0493***	-0.0047	-0.0524***	-0.0058	-0.0485***	-0.0086
	(-3.3157)	(-0.4667)	(-3.6120)	(-0.5456)	(-3.3816)	(-0.8159)
Heavy RCRA Polluters × Seventh Cir.	0.0179	-0.0238				
	(0.5231)	(-0.4687)				
Seventh Cir.	-0.0270	0.0534				
	(-1.5238)	(1.2799)				
Heavy RCRA Polluters × Sixth Cir.			0.0346	-0.0140		
			(0.5214)	(-0.5505)		
Sixth Cir.			-0.0021	0.0013		
			(-0.0357)	(0.0576)		
Heavy RCRA Polluters × Third Cir.					-0.0446	-[5]
					(-1.2901)	-
Third Cir.					-[6]	-0.0165
					-	(-1.1456)
Constant	0.0537*	-0.0011	0.0501*	0.0033	0.0522*	0.0030
	(1.9077)	(-0.0900)	(1.7884)	(0.2626)	(1.8962)	(0.2447)

[5] The omission is made without sufficient observation.
[6] The omission is made without sufficient observation.

Observations	100	122	100	122	100	122
R-squared	0.194	0.096	0.198	0.074	0.198	0.072
Industry FE	YES	YES	YES	YES	YES	YES
High – Low Default Prob.	0.007***		0.009***		0.016**	

Table IB2 Stock price reaction – 80% threshold

This table reports regression results evaluating how the cumulative abnormal returns (CARs) on firms' stock respond to Apex. The dependent variable is the CAR of each firm's stock over the (-5,5) day event window surrounding the July 28th, 2008, District Court Apex decision. The analysis uses the Fama-French-Carhart four factors model, with 200 days the of estimation period and 50 days of gaps between the estimation period and the event window to compute daily stock CARs. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (SIC 2-digital code) median and zero otherwise. *Seventh Cir.* (*Sixth Cir.* or *Third Cir.*) indicates that firm i's RCRA production wastes during the pre-Apex (2003-2007) period in the Seventh Circuit (Sixth Circuit or Third Circuit) over total production wastes were larger than 80%. The analysis includes two subsamples: High Default Probability firms, which are firms with above-median levels of Campbell et al. (2008) failure probabilities relative to other firms in their industries, and Low Default Probability firms. Regressions (1), (3) and (5) include the High Default Probability subsample, while regressions (2), (4) and (6) include the Low Default Probability subsample. The table also reports the results of tests of the hypothesis that the coefficient estimates on Heavy Polluters for the High-Low Default probability subsamples are equal. Detailed variable definitions can be found in Appendix A. We report t-statistics based on robust standard errors in parentheses. Based on the estimated coefficient p-values (p), * denotes p < 0.1, ** denotes p < 0.05, and *** denotes p < 0.01.

	(1)	(2)	(3)	(4)	(5)	(6)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	CAR(-5,5)	CAR(-5,5)	CAR(-5,5)	CAR(-5,5)	CAR(-5,5)	CAR(-5,5)
Heavy RCRA Polluters	-0.0306*	-0.0039	-0.0339**	-0.0041	-0.0325**	-0.0046
	(-1.9466)	(-0.3243)	(-2.1119)	(-0.3404)	(-2.0639)	(-0.3945)
Heavy RCRA Polluters × Seventh Cir.	-0.0122	0.0173				
	(-0.1307)	(0.4921)				
Seventh Cir.	-0.0446	0.0182				
	(-0.5348)	(0.8349)				
Heavy RCRA Polluters × Sixth Cir.			-0.0097	0.0120		
			(-0.1739)	(0.3077)		
Sixth Cir.			0.0483	-0.0214		
			(1.0436)	(-0.6284)		
Heavy RCRA Polluters × Third Cir.					-0.0459	0.0210
					(-0.8720)	(0.8513)
Third Cir.					0.0227	-0.0087
					(0.7798)	(-0.3705)
Constant	-0.0081	-0.0341	-0.0059	-0.0340	-0.0068	-0.0338
	(-0.0730)	(-0.7036)	(-0.0529)	(-0.7031)	(-0.0610)	(-0.7018)
Observations	270	293	270	293	270	293
R-squared	0.146	0.135	0.143	0.133	0.137	0.132

Industry FE	YES	YES	YES	YES	YES	YES
High – Low Default Prob.	0.079*		0.055*		0.067*	

Table IC1 Robustness tests of interest rate – Expected Default Frequency (EDF)

This table reports regression results evaluating how firms' total interest rate responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. The subsamples are split by Expected Default Frequency (EDF). The dependent variable is the natural logarithm of the basis points of *Total interest rat*e. *Total interest rat*e equals total interest expenses divided by average total liabilities (taking average of total liabilities in year t-1 and year t). *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA wastes during the pre-Apex (2003-2007) period were larger than the industry median and zero otherwise. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include the sample of High Expected Default firms. Regressions (2) and (4) include Low Expected Default firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Expected Default subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. All variables are defined in the Appendix A. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Expected Default	Low Expected Default	High Expected Default	Low Expected Default
Dependent var.	Ln(Total Interest Rate)	Ln(Total Interest Rate)	Ln(Total Interest Rate)	Ln(Total Interest Rate)
Apex × Heavy RCRA Polluters	0.2017**	0.0611	0.1721**	0.0373
	(2.4176)	(0.7779)	(2.2455)	(0.5136)
Constant	5.4913***	5.1524***	9.4354***	5.9143***
	(274.6971)	(242.5735)	(3.7031)	(4.5587)
Observations	1,945	2,110	1,945	2,110
R-squared	0.633	0.634	0.665	0.655
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low EDF	0.089*		0.088*	

Table IC2 Robustness tests of interest rate – categorizing Heavy RCRA Polluters into 1 to 3 by its pollution terciles

This table reports regression results evaluating how firms' total interest rate responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. The dependent variable is the natural logarithm of the basis points of *Total interest rat*e. *Total interest rat*e equals total interest expenses divided by average total liabilities (taking average of total liabilities in year t-1 and year t). *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ are categorized from 1 to 3 based on lowest tercile to highest tercile of firm *i*'s RCRA production wastes during the pre-Apex (2003-2007) period of each industry. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include the sample of High Default Probability firms. Regressions (2) and (4) include Low Default Probability firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. Appendix A provides variable definitions. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(Total Interest Rate)	Ln(Total Interest Rate)	Ln(Total Interest Rate)	Ln(Total Interest Rate)
Apex × Heavy RCRA Polluters	0.1035**	0.0440	0.1071**	0.0240
	(1.9936)	(0.8479)	(2.1807)	(0.4875)
Constant	5.3045***	5.0956***	6.5674***	7.4511***
	(108.0064)	(95.5203)	(3.9746)	(4.6133)
Observations	2,055	2,122	2,055	2,122
R-squared	0.693	0.676	0.712	0.700
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low Default Prob.	0.196		0.103	

Table IC3 Robustness tests of interest rate – longer period to define Heavy RCRA Polluters

This table reports regression results evaluating how firms' total interest rate responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. The dependent variable is the natural logarithm of the basis points of *Total interest rat*e. *Total interest rat*e equals total interest expenses divided by average total liabilities (taking average of total liabilities in year t-1 and year t). *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA wastes during the pre-Apex (2000-2007) period were larger than the industry median and zero otherwise. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include the sample of High Default Probability firms. Regressions (2) and (4) include Low Default Probability firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. Appendix A provides variable definitions. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(Total Interest Rate)	Ln(Total Interest Rate)	Ln(Total Interest Rate)	Ln(Total Interest Rate)
Apex × Heavy RCRA Polluters	0.2547***	0.0538	0.2519***	0.0137
	(2.8888)	(0.6268)	(3.0199)	(0.1723)
Constant	5.3444***	5.1258***	6.5685***	7.5462***
	(266.1783)	(214.1048)	(3.6785)	(4.7426)
Observations	2,055	2,122	2,055	2,122
R-squared	0.696	0.676	0.715	0.700
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low Default Prob.	0.051*		0.011**	

Table IC4 Robustness tests of interest rate – excluding firms in the Seventh Circuit Court

This table reports regression results evaluating how firms' total interest rate responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. We exclude firms located in the Seventh Circuit (more than 70% pollution concentration). The dependent variable is the natural logarithm of the basis points of *Total interest rat*e. *Total interest rat*e equals total interest expenses divided by average total liabilities (taking average of total liabilities in year t-1 and year t). *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA wastes during the pre-Apex (2003-2007) period were larger than the industry median and zero otherwise. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include the sample of High Default Probability firms. Regressions (2) and (4) include Low Default Probability firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. Appendix A provides variable definitions. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(Total Interest Rate)	Ln(Total Interest Rate)	Ln(Total Interest Rate)	Ln(Total Interest Rate)
Apex × Heavy RCRA Polluters	0.3116***	0.0667	0.3040***	0.0235
	(3.5048)	(0.7396)	(3.6490)	(0.2824)
Constant	5.3321***	5.1261***	6.2721***	7.1432***
	(275.9033)	(201.5581)	(4.0256)	(4.7865)
Observations	1,748	1,836	1,886	2,003
R-squared	0.710	0.653	0.714	0.682
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low Default Prob.	0.024**		0.005***	

Table IC5 Robustness tests of interest rate – excluding firms in the Sixth Circuit Court

This table reports regression results evaluating how firms' total interest rate responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. We exclude firms located in the Sixth Circuit (more than 70% pollution concentration). The dependent variable is the natural logarithm of the basis points of *Total interest rat*e. *Total interest rat*e equals total interest expenses divided by average total liabilities (taking average of total liabilities in year t-1 and year t). *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if firm *i*'s RCRA wastes during the pre-Apex (2003-2007) period were larger than the industry median and zero otherwise. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include the sample of High Default Probability firms. Regressions (2) and (4) include Low Default Probability firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. Appendix A provides variable definitions. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (*p*), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(Total Interest Rate)	Ln(Total Interest Rate)	Ln(Total Interest Rate)	Ln(Total Interest Rate)
Apex × Heavy RCRA Polluters	0.2766***	0.0143	0.2662***	-0.0365
	(3.1485)	(0.1609)	(3.2070)	(-0.4418)
Constant	5.3412***	5.1382***	6.0327***	7.5232***
	(277.4885)	(207.9778)	(2.8986)	(4.7899)
Observations	1,903	1,962	1,903	1,962
R-squared	0.709	0.677	0.725	0.702
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low Default Prob.	0.016**		0.003***	

Table IC6 Robustness tests of interest rate – excluding firms in the Third Circuit Court

This table reports regression results evaluating how firms' total interest rate responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. We exclude firms located in the Third Circuit (more than 70% pollution concentration). The dependent variable is the natural logarithm of the basis points of *Total interest rat*e. *Total interest rat*e equals total interest expenses divided by average total liabilities (taking average of total liabilities in year t-1 and year t). *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if firm *i*'s RCRA wastes during the pre-Apex (2003-2007) period were larger than the industry median and zero otherwise. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include the sample of High Default Probability firms. Regressions (2) and (4) include Low Default Probability firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. Appendix A provides variable definitions. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(Total Interest Rate)	Ln(Total Interest Rate)	Ln(Total Interest Rate)	Ln(Total Interest Rate)
Apex × Heavy RCRA Polluters	0.2855***	0.0950	0.2834***	0.0581
	(3.3205)	(1.0933)	(3.4684)	(0.7191)
Constant	5.3319***	5.1202***	6.6146***	7.6462***
	(272.7312)	(208.3969)	(3.6685)	(4.4056)
Observations	2,014	2,026	2,014	2,026
R-squared	0.696	0.677	0.715	0.700
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low Default Prob.	0.067*		0.023**	

Table IC7 Robustness tests of interest rate – triple-difference model

This table reports regression results evaluating how firms' total interest rate responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. The dependent variable is the natural logarithm of the basis points of *Total interest rat*e. *Total interest rat*e equals total interest expenses divided by average total liabilities (taking average of total liabilities in year t-1 and year t). *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA wastes during the pre-Apex (2003-2007) period were larger than the industry median and zero otherwise. High Default Prob. equals one if the firm's probabilities of failure (Campbell et al. 2008) at the end of December 2007 being larger than SIC 2-digital code industry median. Regression (2) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Dependent variable and controls are winsorized at the 1% and 99% levels. All variables are defined in the Appendix A. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)
Dependent var.	Ln(Total Interest Rate)	Ln(Total Interest Rate)
Apex × Heavy RCRA Polluters × High Default Prob.	0.2337*	0.2845**
	(1.8659)	(2.3671)
Apex × Heavy RCRA Polluters	0.0480	0.0017
	(0.5355)	(0.0196)
Constant	5.2317***	6.8712***
	(326.4311)	(6.0637)
Observations	4,180	4,180
R-squared	0.693	0.712
Controls		YES
Year FE	YES	YES
Firm FE	YES	YES
Year × High Default Prob. FE	YES	YES
Firm × High Default Prob. FE	YES	YES

Table IC8 Robustness tests of interest rate – Ln(1+Total interest rate)

This table reports regression results evaluating how firms' total interest rate responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. The dependent variable is the natural logarithm of one plus the decimal number of *Total interest rat*e. Then we take the Ln(1+Total interest rate) into basis points (multiply by 10,000). *Total interest rat*e equals total interest expenses divided by average total liabilities (taking average of total liabilities in year t-1 and year t). *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA wastes during the pre-Apex (2003-2007) period were larger than the industry median and zero otherwise. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include the sample of High Default Probability firms. Regressions (2) and (4) include Low Default Probability firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. Appendix A provides variable definitions. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(1+Total interest rate)	Ln(1+Total interest rate)	Ln(1+Total interest rate)	Ln(1+Total interest rate)
Apex × Heavy RCRA Polluters	37.2902**	6.0962	35.7892**	1.2288
	(2.2760)	(0.4988)	(2.2769)	(0.1074)
Constant	261.7374***	196.1507***	942.8231*	302.8532*
	(73.7060)	(60.8513)	(1.9114)	(1.9112)
Observations	2,150	2,332	2,150	2,332
R-squared	0.710	0.691	0.731	0.726
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low Default Prob.	0.061*		0.032**	

Table IC9 Robustness tests of interest rate – Total interest rate without taking the natural logarithm

This table reports regression results evaluating how firms' total interest rate responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. The dependent variable is the basis point of *Total interest rat*e. *Total interest rat*e equals total interest expenses divided by average total liabilities (taking average of total liabilities in year t-1 and year t). *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA wastes during the pre-Apex (2003-2007) period were larger than the industry median and zero otherwise. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include the sample of High Default Probability firms. Regressions (2) and (4) include Low Default Probability firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. Appendix A provides variable definitions. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Total Interest Rate	Total Interest Rate	Total Interest Rate	Total Interest Rate
Apex × Heavy RCRA Polluters	38.0994**	6.1459	36.5383**	1.2203
	(2.2462)	(0.4893)	(2.2443)	(0.1037)
Constant	266.7435***	199.0156***	979.0196*	309.8199*
	(72.5577)	(60.0810)	(1.9155)	(1.9007)
Observations	2,150	2,332	2,150	2,332
R-squared	0.708	0.688	0.729	0.723
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low Default Prob.	0.062*		0.035**	

Table IC10 Robustness tests of interest rate – Ln(Interest Expenses)

This table reports regression results evaluating how firms' interest expenses responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. The dependent variable is the natural logarithm of the total interest expenses. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA wastes during the pre-Apex (2003-2007) period were larger than the industry median and zero otherwise. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include the sample of High Default Probability firms. Regressions (2) and (4) include Low Default Probability firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. Appendix A provides variable definitions. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(Interest Expenses)	Ln(Interest Expenses)	Ln(Interest Expenses)	Ln(Interest Expenses)
Apex × Heavy RCRA Polluters	0.2849**	0.1949	0.2802***	0.0067
	(2.3490)	(1.5585)	(2.7134)	(0.0639)
Constant	2.6227***	3.2022***	-1.7318	-1.5653
	(96.3253)	(91.2319)	(-0.9457)	(-0.8586)
Observations	2,067	2,123	2,067	2,123
R-squared	0.922	0.924	0.941	0.942
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low Default Prob.	0.279		0.028**	

Table IC11 Robustness tests of interest rate – defining the Apex time since 2010

This table reports regression results evaluating how firms' total interest rate responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. The dependent variable is the natural logarithm of the basis points of *Total interest rat*e. *Total interest rat*e equals total interest expenses divided by average total liabilities (taking average of total liabilities in year t-1 and year t). *Apex* equals one after the 2009 Seventh Circuit Court decision, i.e., from 2010 onward, and zero before 2010. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA wastes during the pre-Apex (2003-2007) period were larger than the industry median and zero otherwise. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include the sample of High Default Probability firms. Regressions (2) and (4) include Low Default Probability firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. Appendix A provides variable definitions. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(Total Interest Rate)	Ln(Total Interest Rate)	Ln(Total Interest Rate)	Ln(Total Interest Rate)
Apex × Heavy RCRA Polluters	0.2544***	0.0848	0.2551***	0.0424
	(3.0720)	(1.0763)	(3.2714)	(0.6026)
Constant	5.3594***	5.1229***	6.5598***	7.5243***
	(382.2334)	(307.3854)	(3.7946)	(4.7307)
Observations	2,055	2,122	2,055	2,122
R-squared	0.695	0.677	0.715	0.700
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low Default Prob.	0.066*		0.016**	

Table ID1 Robustness tests of loan spreads – Expected Default Frequency (EDF)

This table reports regression results evaluating how firms' bank loan spreads responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. The subsamples are split by Expected Default Frequency (EDF). The dependent variable is *Ln(Loan Spread)*, which equals the natural logarithm of the number of basis points above LIBOR that banks charge the firm. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA wastes during the pre-Apex (2003-2007) period were larger than the industry median and zero otherwise. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include the sample of High Expected Default firms. Regressions (2) and (4) include Low Expected Default firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Expected Default subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. All variables are defined in the Appendix A. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Expected Default	Low Expected Default	High Expected Default	Low Expected Default
Dependent var.	Ln(Loan Spread)	Ln(Loan Spread)	Ln(Loan Spread)	Ln(Loan Spread)
Apex × Heavy RCRA Polluters	0.2960***	0.0540	0.2992***	0.0058
	(3.3642)	(0.6739)	(3.5038)	(0.0787)
Constant	4.9211***	4.3800***	4.4083**	8.6305***
	(231.7642)	(254.5035)	(2.2911)	(6.7733)
Observations	692	875	692	875
R-squared	0.777	0.866	0.787	0.878
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low EDF	0.030**		0.007***	

Table ID2 Robustness tests of loan spreads – categorizing Heavy RCRA Polluters into 1 to 3 by its pollution terciles

This table reports regression results evaluating how firms' bank loan spreads responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. The dependent variable is *Ln(Loan Spread)*, which equals the natural logarithm of the number of basis points above LIBOR that banks charge the firm. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ are categorized from 1 to 3 based on lowest tercile to highest tercile of firm i's RCRA production wastes during the pre-Apex (2003-2007) period of each industry. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include the sample of High Default Probability firms. Regressions (2) and (4) include Low Default Probability firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. Appendix A provides variable definitions. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(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 RCRA Polluters	0.0964*	0.0148	0.0980*	-0.0108
	(1.6909)	(0.2781)	(1.7577)	(-0.2273)
Constant	4.8456***	4.4052***	3.5529	8.1881***
	(98.9915)	(101.5458)	(1.4343)	(6.8086)
Observations	737	824	737	824
R-squared	0.813	0.851	0.827	0.869
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low Default Prob.	0.136		0.058*	

Table ID3 Robustness tests of loan spreads – longer period to define Heavy RCRA Polluters

This table reports regression results evaluating how firms' bank loan spreads responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. The dependent variable is *Ln(Loan Spread)*, which equals the natural logarithm of the number of basis points above LIBOR that banks charge the firm. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA wastes during the pre-Apex (2000-2007) period were larger than the industry median and zero otherwise. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include the sample of High Default Probability firms. Regressions (2) and (4) include Low Default Probability firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. Appendix A provides variable definitions. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(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 RCRA Polluters	0.2664***	0.0002	0.2636***	-0.0274
	(3.0647)	(0.0024)	(3.1213)	(-0.3585)
Constant	4.8658***	4.4172***	3.8968	8.1574***
	(238.4594)	(243.4722)	(1.6061)	(6.7580)
Observations	737	824	737	824
R-squared	0.817	0.851	0.831	0.869
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low Default Prob.	0.015**		0.004***	

Table ID4 Robustness tests of loan spreads – excluding firms in the Seventh Circuit Court

This table reports regression results evaluating how firms' bank loan spreads responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. We exclude firms located in the Seventh Circuit (more than 70% pollution concentration). The dependent variable is *Ln(Loan Spread)*, which equals the natural logarithm of the number of basis points above LIBOR that banks charge the firm. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA wastes during the pre-Apex (2003-2007) period were larger than the industry median and zero otherwise. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include the sample of High Default Probability firms. Regressions (2) and (4) include Low Default Probability firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. Appendix A provides variable definitions. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(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 RCRA Polluters	0.2589***	0.0289	0.2561***	-0.0017
	(2.8670)	(0.3245)	(2.9875)	(-0.0209)
Constant	4.8691***	4.3976***	3.8341*	7.4325***
	(241.5941)	(228.9154)	(1.9415)	(5.4729)
Observations	681	787	681	787
R-squared	0.818	0.855	0.833	0.872
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low Default Prob.	0.020**		0.038**	

Table ID5 Robustness tests of loan spreads – excluding firms in the Sixth Circuit Court

This table reports regression results evaluating how firms' bank loan spreads responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. We exclude firms located in the Sixth Circuit (more than 70% pollution concentration). The dependent variable is *Ln(Loan Spread)*, which equals the natural logarithm of the number of basis points above LIBOR that banks charge the firm. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA wastes during the pre-Apex (2003-2007) period were larger than the industry median and zero otherwise. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include the sample of High Default Probability firms. Regressions (2) and (4) include Low Default Probability firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. Appendix A provides variable definitions. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(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 RCRA Polluters	0.2771***	0.0296	0.2671***	-0.0033
	(3.0116)	(0.3209)	(2.9780)	(-0.0404)
Constant	4.8753***	4.4086***	3.9913	8.2926***
	(234.9365)	(223.8172)	(1.3815)	(6.7159)
Observations	665	764	665	764
R-squared	0.816	0.853	0.828	0.872
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low Default Prob.	0.036**		0.016**	

Table ID6 Robustness tests of loan spreads – excluding firms in the Third Circuit Court

This table reports regression results evaluating how firms' bank loan spreads responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. We exclude firms located in the Third Circuit (more than 70% pollution concentration). The dependent variable is *Ln(Loan Spread)*, which equals the natural logarithm of the number of basis points above LIBOR that banks charge the firm. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA wastes during the pre-Apex (2003-2007) period were larger than the industry median and zero otherwise. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include the sample of High Default Probability firms. Regressions (2) and (4) include Low Default Probability firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. Appendix A provides variable definitions. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(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 RCRA Polluters	0.2585***	-0.0270	0.2595***	-0.0404
	(2.9466)	(-0.3030)	(3.0739)	(-0.4877)
Constant	4.8758***	4.4054***	3.8941	7.6696***
	(236.6226)	(228.2399)	(1.6121)	(6.4051)
Observations	728	788	728	788
R-squared	0.810	0.852	0.825	0.868
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low Default Prob.	0.016**		0.008***	

Table ID7 Robustness tests of loan spreads – triple-difference model

This table reports regression results evaluating how firms' bank loan spreads responded to *Apex*. The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. The dependent variable is *Ln(Loan Spread)*, which equals the natural logarithm of the number of basis points above LIBOR that banks charge the firm. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA wastes during the pre-Apex (2003-2007) period were larger than the industry median and zero otherwise. *High Default Prob.* equals one if the firm's probabilities of failure (Campbell et al. 2008) at the end of December 2007 being larger than SIC 2-digital code industry median. Regression (2) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Dependent variable and controls are winsorized at the 1% and 99% levels. All variables are defined in the Appendix A. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)
Dependent var.	Ln(Loan Spread)	Ln(Loan Spread)
Apex × Heavy RCRA Polluters × High Default Prob.	0.2574*	0.2845**
	(1.9436)	(2.2608)
Apex × Heavy RCRA Polluters	-0.0018	-0.0257
	(-0.0195)	(-0.2940)
Constant	4.6331***	6.7581***
	(310.1678)	(5.5321)
Observations	1,570	1,570
R-squared	0.852	0.863
Controls		YES
Year FE	YES	YES
Firm FE	YES	YES
Year × High Default Prob. FE	YES	YES
Firm × High Default Prob. FE	YES	YES

Table ID8 Robustness tests of loan spreads – Ln(1+Loan Spread)

This table reports regression results evaluating how firms' bank loan spreads responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. The dependent variable is the natural logarithm of one plus the decimal number of Loan Spread. Then take Ln(1+ Loan Spread) into basis points (multiply by 10,000). *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA wastes during the pre-Apex (2003-2007) period were larger than the industry median and zero otherwise. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include the sample of High Default Probability firms. Regressions (2) and (4) include Low Default Probability firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. Appendix A provides variable definitions. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(1+Loan Spread)	Ln(1+Loan Spread)	Ln(1+Loan Spread)	Ln(1+Loan Spread)
Apex × Heavy RCRA Polluters	32.8244**	-0.1099	29.9495**	-2.5333
	(2.4834)	(-0.0119)	(2.3812)	(-0.2880)
Constant	166.2931***	115.3726***	118.5095	188.4218*
	(53.9089)	(57.5255)	(0.2918)	(1.6804)
Observations	737	824	737	824
R-squared	0.754	0.798	0.769	0.826
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low Default Prob.	0.019**		0.010**	

Table ID9 Robustness tests of loan spreads – loan spreads without taking the natural logarithm

This table reports regression results evaluating how firms' bank loan spreads responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. The dependent variable is the basis points of bank loan spreads. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA wastes during the pre-Apex (2003-2007) period were larger than the industry median and zero otherwise. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include the sample of High Default Probability firms. Regressions (2) and (4) include Low Default Probability firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. Appendix A provides variable definitions. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Loan Spread	Loan Spread	Loan Spread	Loan Spread
Apex × Heavy RCRA Polluters	33.3560**	-0.0637	30.3796**	-2.5433
	(2.4594)	(-0.0068)	(2.3540)	(-0.2832)
Constant	168.2981***	116.4535***	122.9304	187.6211
	(53.1700)	(56.8886)	(0.2961)	(1.6392)
Observations	737	824	737	824
R-squared	0.752	0.796	0.767	0.825
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low Default Prob.	0.010**		0.012**	

Table ID10 Robustness tests of loan spreads – loan maturity

This table reports regression results evaluating how firms' bank loan maturity responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. The dependent variable is *Ln(Maturity)*, which equals the natural logarithm of the loan size weighted maturity of the firm. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry median and zero otherwise. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include High Default Probability firms. Regressions (2) and (4) include Low Default Probability firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. All variables are defined in the Appendix A. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(Maturity)	Ln(Maturity)	Ln(Maturity)	Ln(Maturity)
Apex × Heavy RCRA Polluters	-0.1048*	-0.0654	-0.1215**	-0.0460
	(-1.9214)	(-1.2960)	(-2.2491)	(-0.9057)
Constant	3.8812***	3.7745***	2.3207**	4.0212***
	(373.2130)	(347.1810)	(2.1517)	(4.3565)
Observations	850	989	850	989
R-squared	0.465	0.495	0.474	0.503
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low Default Prob.	0.359		0.200	

Table ID11 Robustness tests of loan spreads – defining the Apex time since 2010

This table reports regression results evaluating how firms' bank loan spreads responded to *Apex.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. The dependent variable is *Ln(Loan Spread)*, which equals the natural logarithm of the number of basis points above LIBOR that banks charge the firm. *Apex* equals one after the 2009 Seventh Circuit Court decision, i.e., from 2010 onward, and zero before 2010. $Heavy\ RCRA\ Polluters_i$ equals one if firm i's RCRA wastes during the pre-Apex (2003-2007) period were larger than the industry median and zero otherwise. Regressions include firm and year fixed effects. Regressions (3) and (4) include: R&D Intensity, capital expenditure/total assets (CAPX/AT), advertising expenditures/total assets (XAD/AT), ROA, Leverage, Tangibility, Tobin's Q, the natural logarithm of the book value of total assets (Ln(AT)), capital intensity (Labor/Capital), and the age of the firm (Firm Age). Regressions (1) and (3) include the sample of High Default Probability firms. Regressions (2) and (4) include Low Default Probability firms. The table reports the results of tests of the hypothesis that the coefficient estimates on *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Dependent variable and controls are winsorized at the 1% and 99% levels. Appendix A provides variable definitions. Parentheses include t-statistics based on robust standard errors clustered at the firm level. Using estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(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 RCRA Polluters	0.2251***	-0.0073	0.2242***	-0.0387
	(2.8566)	(-0.0875)	(2.9847)	(-0.5089)
Constant	4.8840***	4.4187***	3.5880	8.1417***
	(315.0693)	(278.2515)	(1.4544)	(6.7576)
Observations	737	824	737	824
R-squared	0.815	0.851	0.829	0.869
Controls			YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
High - Low Default Prob.	0.017**		0.005***	

Table IE1 Robustness tests of facility pollution prevention activities– Expected Default Frequency (EDF)

This table reports regression results evaluating how facilities' pollution prevention activities responded to the Apex decision based on Expected Default Frequency (EDF). The dependent variable is $Pollution\ Prevention_{it}$ which is the summation of the number of pollution prevention practices (W codes) of facility *i* in year *t.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. *Apex* equals one after the 2008 Apex District Court decision and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if facility i's RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. High Expected Default includes facilities belonging to firms with the expected default frequency of Merton's (1974) distance to default model in December 2007 being larger than industry (NAICS 3-digital code) median. All other facilities are assigned to the Low Expected Default. As indicated, regressions control for Facility and Parent-Year fixed effects. Regressions (3) and (4) also include Ln(Emp) and Ln(Sales) from NETS, which are defined in Appendix A. The table also reports the results of tests of the hypothesis that the coefficient estimates on *Apex* × *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Appendix A provides detailed variable definitions. We report t-statistics based on robust standard errors clustered at the facility level in parentheses. Based on the estimated coefficient p-values (*p*), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Expected Default	Low Expected Default	High Expected Default	Low Expected Default
Dependent var.	Pollution Prevention	Pollution Prevention	Pollution Prevention	Pollution Prevention
Apex × Heavy RCRA Polluters	0.5063***	-0.1728	0.5017**	-0.1688
	(2.5847)	(-0.9404)	(2.5599)	(-0.9227)
Ln(Emp)			-0.1730	-0.1423
			(-0.7681)	(-0.6255)
Ln(Sales)			0.2142	0.0873
			(1.3190)	(0.4191)
Constant	1.6942***	1.6026***	-1.1474	0.7563
	(40.6158)	(39.9681)	(-0.5622)	(0.2842)
Observations	1,847	2,960	1,847	2,960
Pseudo R2	0.618	0.565	0.618	0.565
Facility FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High – Low Default Prob.	0.041**		0.044**	

Table IE2 Robustness tests of facility pollution prevention activities– categorizing Heavy RCRA Polluters into 1 to 3 by its pollution terciles

This table reports regression results evaluating how facilities' pollution prevention activities responded to the Apex decision by categorizing Heavy RCRA Polluters into 1 to 3. The dependent variable is $Pollution\ Prevention_{it}$ which is the summation of the number of pollution prevention practices (W codes) of facility i in year t. The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. *Apex* equals one after the 2008 Apex District Court decision and zero before 2009. $Heavy\ RCRA\ Polluters_i$ are categorized from 1 to 3 based on lowest tercile to highest tercile of facility i's RCRA production wastes during the pre-Apex (2003-2007) period of each industry. As indicated, regressions control for Facility and Parent-Year fixed effects. Regressions (3) and (4) also include Ln(Emp) and Ln(Sales) from NETS, which are defined in Appendix A. Regressions (1) and (3) include the sample of High Default Probability firms, i.e., firms with above the median levels of Campbell et al. (2008) failure probabilities relative to other firms in their industries. Regressions (2) and (4) include the corresponding sample of Low Default Probability firms. The table also reports the results of tests of the hypothesis that the coefficient estimates on *Apex* × *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Appendix A provides detailed variable definitions. We report t-statistics based on robust standard errors clustered at the facility level in parentheses. Based on the estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Pollution Prevention	Pollution Prevention	Pollution Prevention	Pollution Prevention
Apex × Heavy RCRA Polluters	0.3701*	-0.0074	0.3746*	-0.0131
	(1.8489)	(-0.0541)	(1.9027)	(-0.0964)
Ln(Emp)			-0.0669	-0.1965
			(-0.3244)	(-0.8631)
Ln(Sales)			0.1343	0.1347
			(0.7318)	(0.6568)
Constant	1.2908***	1.7717***	-0.7272	0.3664
	(9.3117)	(14.7090)	(-0.2922)	(0.1420)
Observations	1,827	2,860	1,827	2,860
Pseudo R2	0.555	0.611	0.555	0.611
Facility FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High – Low Default Prob.	0.095*		0.091*	

Table IE3 Robustness tests of facility pollution prevention activities– longer period to define Heavy RCRA Polluters

This table reports regression results evaluating how facilities' pollution prevention activities responded to the Apex decision with different definition of Heavy RCRA Polluters based on a longer period. The dependent variable is $Pollution\ Prevention_{it}$ which is the summation of the number of pollution prevention practices (W codes) of facility *i* in year *t.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. *Apex* equals one after the 2008 Apex District Court decision and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if facility *i*'s RCRA production wastes during the pre-Apex (2000-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. As indicated, regressions control for Facility and Parent-Year fixed effects. Regressions (3) and (4) also include Ln(Emp) and Ln(Sales) from NETS, which are defined in Appendix A. Regressions (1) and (3) include the sample of High Default Probability firms, i.e., firms with above the median levels of Campbell et al. (2008) failure probabilities relative to other firms in their industries. Regressions (2) and (4) include the corresponding sample of Low Default Probability firms. The table also reports the results of tests of the hypothesis that the coefficient estimates on *Apex* × *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Appendix A provides detailed variable definitions. We report t-statistics based on robust standard errors clustered at the facility level in parentheses. Based on the estimated coefficient p-values (*p*), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Pollution Prevention	Pollution Prevention	Pollution Prevention	Pollution Prevention
Apex × Heavy RCRA Polluters	0.4369*	-0.0523	0.4415*	-0.0486
	(1.8369)	(-0.2710)	(1.8517)	(-0.2532)
Ln(Emp)			-0.1092	-0.1942
			(-0.4765)	(-0.8517)
Ln(Sales)			0.1631	0.1343
			(0.8340)	(0.6518)
Constant	1.4831***	1.7768***	-0.8261	0.3620
	(42.8480)	(36.3998)	(-0.3254)	(0.1398)
Observations	1,825	2,870	1,825	2,870
Pseudo R2	0.554	0.611	0.554	0.611
Facility FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High – Low Default Prob.	0.116		0.122	

Table IE4 Robustness tests of facility pollution prevention activities– excluding firms in the Seventh Circuit Court

This table reports regression results evaluating how facilities' pollution prevention activities responded to the Apex decision excluding parent firms located in the Seventh Circuit (more than 70% pollution concentration). The dependent variable is $Pollution\ Prevention_{it}$ which is the summation of the number of pollution prevention practices (W codes) of facility *i* in year *t.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. *Apex* equals one after the 2008 Apex District Court decision and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if facility i's RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. As indicated, regressions control for Facility and Parent-Year fixed effects. Regressions (3) and (4) also include Ln(Emp) and Ln(Sales) from NETS, which are defined in Appendix A. Regressions (1) and (3) include the sample of High Default Probability firms, i.e., firms with above the median levels of Campbell et al. (2008) failure probabilities relative to other firms in their industries. Regressions (2) and (4) include the corresponding sample of Low Default Probability firms. The table also reports the results of tests of the hypothesis that the coefficient estimates on *Apex* × *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Appendix A provides detailed variable definitions. We report t-statistics based on robust standard errors clustered at the facility level in parentheses. Based on the estimated coefficient p-values (*p*), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Pollution Prevention	Pollution Prevention	Pollution Prevention	Pollution Prevention
Apex × Heavy RCRA Polluters	0.5159**	-0.0909	0.5198**	-0.0875
	(2.1434)	(-0.4664)	(2.1470)	(-0.4522)
Ln(Emp)			-0.1109	-0.1955
			(-0.4774)	(-0.8537)
Ln(Sales)			0.1711	0.1352
			(0.8611)	(0.6527)
Constant	1.5044***	1.6525***	-0.9366	0.2310
	(44.3607)	(32.5497)	(-0.3637)	(0.0883)
Observations	1,709	2,816	1,709	2,816
Pseudo R2	0.556	0.581	0.556	0.581
Facility FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High – Low Default Prob.	0.073*		0.072*	

Table IE5 Robustness tests of facility pollution prevention activities– excluding firms in the Sixth Circuit Court

This table reports regression results evaluating how facilities' pollution prevention activities responded to the Apex decision excluding parent firms located in the Sixth Circuit (more than 70% pollution concentration). The dependent variable is $Pollution\ Prevention_{it}$ which is the summation of the number of pollution prevention practices (W codes) of facility i in year t. The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. *Apex* equals one after the 2008 Apex District Court decision and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if facility i's RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. As indicated, regressions control for Facility and Parent-Year fixed effects. Regressions (3) and (4) also include Ln(Emp) and Ln(Sales) from NETS, which are defined in Appendix A. Regressions (1) and (3) include the sample of High Default Probability firms, i.e., firms with above the median levels of Campbell et al. (2008) failure probabilities relative to other firms in their industries. Regressions (2) and (4) include the corresponding sample of Low Default Probability firms. The table also reports the results of tests of the hypothesis that the coefficient estimates on *Apex* × *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Appendix A provides detailed variable definitions. We report t-statistics based on robust standard errors clustered at the facility level in parentheses. Based on the estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Pollution Prevention	Pollution Prevention	Pollution Prevention	Pollution Prevention
Apex × Heavy RCRA Polluters	0.4805**	-0.1000	0.4781**	-0.0953
	(1.9814)	(-0.5057)	(1.9609)	(-0.4855)
Ln(Emp)			-0.1590	-0.1804
			(-0.6933)	(-0.7764)
Ln(Sales)			0.1705	0.1166
			(0.8662)	(0.5536)
Constant	1.4695***	1.7603***	-0.7248	0.5803
	(44.3818)	(36.1013)	(-0.2852)	(0.2182)
Observations	1,801	2,724	1,801	2,724
Pseudo R2	0.552	0.606	0.552	0.606
Facility FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High – Low Default Prob.	0.097*		0.097*	

Table IE6 Robustness tests of facility pollution prevention activities– excluding firms in the Third Circuit Court

This table reports regression results evaluating how facilities' pollution prevention activities responded to the Apex decision excluding parent firms located in the Third Circuit (more than 70% pollution concentration). The dependent variable is $Pollution\ Prevention_{it}$ which is the summation of the number of pollution prevention practices (W codes) of facility i in year t. The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. *Apex* equals one after the 2008 Apex District Court decision and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if facility i's RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. As indicated, regressions control for Facility and Parent-Year fixed effects. Regressions (3) and (4) also include Ln(Emp) and Ln(Sales) from NETS, which are defined in Appendix A. Regressions (1) and (3) include the sample of High Default Probability firms, i.e., firms with above the median levels of Campbell et al. (2008) failure probabilities relative to other firms in their industries. Regressions (2) and (4) include the corresponding sample of Low Default Probability firms. The table also reports the results of tests of the hypothesis that the coefficient estimates on *Apex* × *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Appendix A provides detailed variable definitions. We report t-statistics based on robust standard errors clustered at the facility level in parentheses. Based on the estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Pollution Prevention	Pollution Prevention	Pollution Prevention	Pollution Prevention
Apex × Heavy RCRA Polluters	0.5193**	-0.1438	0.5222**	-0.1383
	(2.1882)	(-0.7430)	(2.1879)	(-0.7196)
Ln(Emp)			-0.1085	-0.1176
			(-0.4740)	(-0.5215)
Ln(Sales)			0.1612	0.0604
			(0.8240)	(0.2974)
Constant	1.4758***	1.8000***	-0.8038	1.3159
	(45.1436)	(36.8304)	(-0.3173)	(0.5157)
Observations	1,825	2,826	1,825	2,826
Pseudo R2	0.555	0.612	0.555	0.612
Facility FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High – Low Default Prob.	0.050*		0.052*	

Table IE7 Robustness tests of facility pollution prevention activities– triple-difference model

This table reports triple-difference results evaluating how facilities' pollution prevention activities responded to the Apex decision. The dependent variable is $Pollution\ Prevention_{it}$ which is the summation of the number of pollution prevention practices (W codes) of facility *i* in year *t.* The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. *Apex* equals one after the 2008 Apex District Court decision and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if facility i's RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. High Default Prob. equals one if the facility's probability of failure (measured by Campbell et al. 2008) of parent firm in December 2007 being larger than industry (NAICS 3-digital code) median and zero otherwise. Appendix A provides detailed variable definitions. We report t-statistics based on robust standard errors clustered at the facility level in parentheses. Based on the estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

Dependent var.	(1) Pollution Prevention	(2) Pollution Prevention
Apex × Heavy RCRA Polluters × High Default Prob.	0.5807*	0.5727*
	(1.9131)	(1.8801)
Apex × Heavy RCRA Polluters	-0.0875	-0.0861
	(-0.4542)	(-0.4483)
Ln(Emp)		-0.1769
		(-1.0696)
Ln(Sales)		0.1391
		(0.9412)
Constant	1.6472***	0.0711
	(51.1835)	(0.0382)
Observations	4,910	4,910
Pseudo R2	0.590	0.591
Facility FE	YES	YES
Parent-Year FE	YES	YES
Facility × High Default Prob. FE	YES	YES
Parent-Year × High Default Prob. FE	YES	YES

Table IE8 Robustness tests of facility pollution prevention activities– different cluster levels

This table reports regression results evaluating how facilities' pollution prevention activities responded to the Apex decision with standard error cluster at state level (Panel A) or firm level (Panel B). The dependent variable is $Pollution\ Prevention_{it}$ which is the summation of the number of pollution prevention practices (W codes) of facility i in year t. The sample runs from 2004 to 2012 and excludes 2008, the year of the Apex decision. *Apex* equals one after the 2008 Apex District Court decision and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if facility i's RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. As indicated, regressions control for Facility and Parent-Year fixed effects. Regressions (3) and (4) also include Ln(Emp) and Ln(Sales) from NETS, which are defined in Appendix A. Regressions (1) and (3) include the sample of High Default Probability firms, i.e., firms with above the median levels of Campbell et al. (2008) failure probabilities relative to other firms in their industries. Regressions (2) and (4) include the corresponding sample of Low Default Probability firms. The table also reports the results of tests of the hypothesis that the coefficient estimates on *Apex* × *Heavy RCRA Polluters* for the High-Low Default probability subsamples are equal. Appendix A provides detailed variable definitions. Based on the estimated coefficient p-values (p), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

Panel A. Cluster at the state level				
	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Pollution Prevention	Pollution Prevention	Pollution Prevention	Pollution Prevention
Apex × Heavy RCRA Polluters	0.5193**	-0.0875	0.5222**	-0.0840
	(2.0186)	(-0.4694)	(2.0620)	(-0.4582)
Ln(Emp)			-0.1085	-0.1940
			(-0.6052)	(-0.7210)
Ln(Sales)			0.1612	0.1346
			(0.9316)	(0.5601)
Constant	1.4758***	1.7858***	-0.8038	0.3646
	(41.6445)	(37.8546)	(-0.3386)	(0.1219)
Observations	1,825	2,870	1,825	2,870
Pseudo R2	0.555	0.611	0.555	0.611
Facility FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High - Low Default	0.090*		0.091*	
Panel B. Cluster at the firm level				
Apex × Heavy RCRA Polluters	0.5193*	-0.0875	0.5222*	-0.0840
	(1.6815)	(-0.2720)	(1.6859)	(-0.2638)
Ln(Emp)			-0.1085	-0.1940
			(-0.4392)	(-0.7683)
Ln(Sales)			0.1612	0.1346
			(0.8289)	(0.5558)
Constant	1.4758***	1.7858***	-0.8038	0.3646
	(34.6889)	(21.9358)	(-0.3116)	(0.1186)
Observations	1,825	2,870	1,825	2,870
Pseudo R2	0.555	0.611	0.555	0.611
Facility FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High - Low Default	0.090*		0.091*	

Table IF1 Robustness tests of Non-air Toxic Releases – Expected Default Frequency (EDF)

This table reports robust DID results of the Non-air Toxic Releases of facilities from 2004-2012 without the year 2008 based on Expected Default Frequency (EDF). This is facility-by-chemical-by-year level data. We drop non-RCRA chemicals observations**.** The dependent variable is Ln(1 + Non-air Toxic Releases$_{ict}$), where Non-air Toxic Releases$_{ict}$ equals the amount of non-air RCRA toxic chemical *c* released by facility *i* in year *t*. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if facility *i*'s RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. High Expected Default includes facilities belonging to firms with the expected default frequency of Merton's (1974) distance to default model in December 2007 being larger than industry (NAICS 3-digital code) median. All other facilities are assigned to the Low Expected Default. All variables are defined in the Appendix A. Facility-clustered standard errors-based t statistics are reported in parentheses. * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Expected Default	Low Expected Default	High Expected Default	Low Expected Default
Dependent var.	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)
Apex × Heavy RCRA Polluters	-0.2612***	-0.0015	-0.2612**	0.0374
	(-2.6373)	(-0.0116)	(-2.5149)	(0.3260)
Ln(Emp)			0.0655	0.0272
			(0.4836)	(0.1633)
Ln(Sales)			-0.0782	0.0290
			(-0.5770)	(0.1849)
Constant	3.7433***	3.8331***	4.8335***	3.1321
	(180.3424)	(106.8088)	(2.7605)	(1.5219)
Observations	35,475	53,236	31,549	46,617
R-squared	0.780	0.749	0.788	0.757
Facility FE	YES	YES	YES	YES
Chemical-Year FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High – Low EDF	0.096*		0.048**	

Table IF2 Robustness tests of Non-air Toxic Releases – categorizing Heavy RCRA Polluters into 1 to 3 by its pollution terciles

This table reports DID results of the Non-air Toxic Releases of facilities from 2004-2012 without the year 2008 by categorizing Heavy RCRA Polluters into 1 to 3. This is facility-by-chemical-by-year level data. We drop non-RCRA chemicals observations**.** The dependent variable is Ln(1 + Non-air Toxic Releases$_{ict}$), where Non-air Toxic Releases$_{ict}$ equals the amount of non-air RCRA toxic chemical *c* released by facility *i* in year *t*. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ are categorized from 1 to 3 based on lowest tercile to highest tercile of facility *i*'s RCRA production wastes during the pre-Apex (2003-2007) period of each industry. 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. All variables are defined in the Appendix A. Facility-cluster standard errors-based t statistics are reported in parentheses. * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)
Apex × Heavy RCRA Polluters	-0.3088***	0.0733	-0.3464***	0.0833
	(-3.6057)	(0.9497)	(-3.7765)	(1.1981)
Ln(Emp)			0.1005	0.0635
			(0.7308)	(0.3921)
Ln(Sales)			-0.0070	-0.0577
			(-0.0544)	(-0.3668)
Constant	4.0467***	3.6996***	3.6040**	4.4574**
	(49.6789)	(49.4174)	(2.1421)	(2.1658)
Observations	34,918	54,261	30,614	47,893
R-squared	0.799	0.736	0.801	0.748
Facility FE	YES	YES	YES	YES
Chemical-Year FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High - Low Default Prob.	0.003***		0.000***	

Table IF3 Robustness tests of Non-air Toxic Releases – longer period to define Heavy RCRA Polluters

This table reports the DID results of the Non-air Toxic Releases of facilities from 2004-2012 without the year 2008 with different definition of Heavy RCRA Polluters based on a longer period. This is facility-by-chemical-by-year level data. We drop non-RCRA chemicals observations**.** The dependent variable is Ln(1 + Non-air Toxic Releases$_{ict}$), where Non-air Toxic Releases$_{ict}$ equals the amount of non-air RCRA toxic chemical *c* released by facility *i* in year *t*. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if facility *i*'s RCRA production wastes during the pre-Apex (2000-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. 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. All variables are defined in the Appendix A. Facility-clustered standard errors-based t statistics are reported in parentheses. * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)
Apex × Heavy RCRA Polluters	-0.3909***	0.0255	-0.4385***	0.0852
	(-3.3303)	(0.2451)	(-3.3862)	(0.8335)
Ln(Emp)			0.1164	0.0607
			(0.8383)	(0.3764)
Ln(Sales)			-0.0191	-0.0590
			(-0.1501)	(-0.3789)
Constant	3.8439***	3.7640***	3.5174**	4.5534**
	(140.7742)	(138.7108)	(2.1102)	(2.2348)
Observations	34,918	54,261	30,614	47,893
R-squared	0.799	0.736	0.801	0.748
Facility FE	YES	YES	YES	YES
Chemical-Year FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High - Low Default Prob.		0.009***		0.001***

Table IF4 Robustness tests of Non-air Toxic Releases – excluding firms in the Seventh Circuit Court

This table reports the DID results of the Non-air Toxic Releases of facilities from 2004-2012 without the year 2008 excluding parent firms located in the Seventh Circuit (more than 70% pollution concentration). This is facility-by-chemical-by-year level data. We drop non-RCRA chemicals observations**.** The dependent variable is Ln(1 + Non-air Toxic Releases$_{ict}$), where Non-air Toxic Releases$_{ict}$ equals the amount of non-air RCRA toxic chemical *c* released by facility *i* in year *t*. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if facility *i*'s RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. 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. All variables are defined in the Appendix A. Facility-clustered standard errors-based t statistics are reported in parentheses. * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)
Apex × Heavy RCRA Polluters	-0.5063***	0.0510	-0.5308***	0.0881
	(-3.8700)	(0.4812)	(-3.7824)	(0.8651)
Ln(Emp)			0.1084	0.0499
			(0.7941)	(0.3075)
Ln(Sales)			-0.0053	-0.0455
			(-0.0416)	(-0.2892)
Constant	3.7884***	3.7546***	3.2576**	4.3622**
	(120.0566)	(134.6716)	(1.9634)	(2.1098)
Observations	32,735	53,231	28,672	46,931
R-squared	0.792	0.737	0.795	0.749
Facility FE	YES	YES	YES	YES
Chemical-Year FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High - Low Default Prob.		0.002***		0.001***

Table IF5 Robustness tests of Non-air Toxic Releases – excluding firms in the Sixth Circuit Court

This table reports the DID results of the Non-air Toxic Releases of facilities from 2004-2012 without the year 2008 excluding parent firms located in the Sixth Circuit (more than 70% pollution concentration). This is facility-by-chemical-by-year level data. We drop non-RCRA chemicals observations**.** The dependent variable is Ln(1 + Non-air Toxic Releases$_{ict}$), where Non-air Toxic Releases$_{ict}$ equals the amount of non-air RCRA toxic chemical *c* released by facility *i* in year *t*. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if facility *i*'s RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. 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. All variables are defined in the Appendix A. Facility-clustered standard errors-based t statistics are reported in parentheses. * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)
Apex × Heavy RCRA Polluters	-0.5282***	0.0549	-0.5656***	0.0833
	(-3.9236)	(0.5045)	(-3.9388)	(0.7967)
Ln(Emp)			0.1254	0.0734
			(0.8953)	(0.4486)
Ln(Sales)			-0.0142	-0.0712
			(-0.1097)	(-0.4503)
Constant	3.8789***	3.7866***	3.4443**	4.7378**
	(120.1246)	(134.9893)	(2.0211)	(2.2886)
Observations	31,418	50,938	27,712	44,885
R-squared	0.799	0.737	0.803	0.748
Facility FE	YES	YES	YES	YES
Chemical-Year FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High - Low Default Prob.		0.002***		0.000***

Table IF6 Robustness tests of Non-air Toxic Releases – excluding firms in the Third Circuit Court

This table reports the DID results of the Non-air Toxic Releases of facilities from 2004-2012 without the year 2008 excluding parent firms located in the Third Circuit (more than 70% pollution concentration). This is facility-by-chemical-by-year level data. We drop non-RCRA chemicals observations**.** The dependent variable is Ln(1 + Non-air Toxic Releases$_{ict}$), where Non-air Toxic Releases$_{ict}$ equals the amount of non-air RCRA toxic chemical *c* released by facility *i* in year *t*. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if facility *i*'s RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. 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. All variables are defined in the Appendix A. Facility-clustered standard errors-based t statistics are reported in parentheses. * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)
Apex × Heavy RCRA Polluters	-0.4701***	0.0491	-0.5048***	0.0885
	(-3.8947)	(0.4636)	(-3.9027)	(0.8663)
Ln(Emp)			0.0989	0.0678
			(0.7219)	(0.4170)
Ln(Sales)			-0.0009	-0.0639
			(-0.0072)	(-0.4061)
Constant	3.8717***	3.7658***	3.3072**	4.6099**
	(135.1501)	(134.6661)	(1.9781)	(2.2381)
Observations	34,806	53,551	30,502	47,235
R-squared	0.799	0.737	0.801	0.749
Facility FE	YES	YES	YES	YES
Chemical-Year FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High - Low Default Prob.		0.006***		0.001***

Table IF7 Robustness tests of Non-air Toxic Releases – triple-difference model

This table reports triple-difference results of the Non-air Toxic Releases of facilities from 2004-2012 without the year 2008. This is facility-by-chemical-by-year level data. We drop non-RCRA chemicals observations. The dependent variable is Ln(1 + Non-air Toxic Releases$_{ict}$), where Non-air Toxic Releases$_{ict}$ equals the amount of non-air RCRA toxic chemical *c* released by facility *i* in year *t*. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if facility i's RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. High Default Prob. equals one if the facility's probability of failure (measured by Campbell et al. 2008) of parent firm in December 2007 being larger than industry (NAICS 3-digital code) median and zero otherwise. All variables are defined in the Appendix A. Facility-clustered standard errors-based t statistics are reported in parentheses. * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

Dependent var.	(1) Ln(1+Non-air Toxic Releases)	(2) Ln(1+Non-air Toxic Releases)
Apex × Heavy RCRA Polluters × High Default Prob.	-0.5116***	-0.5895***
	(-3.1719)	(-3.5059)
Apex × Heavy RCRA Polluters	0.0415	0.0807
	(0.3889)	(0.7831)
Ln(Emp)		0.0625
		(0.5916)
Ln(Sales)		-0.0270
		(-0.2709)
Constant	3.7998***	3.9568***
	(186.8217)	(3.0266)
Observations	89,278	78,597
R-squared	0.762	0.769
Facility FE	YES	YES
Chemical-Year FE	YES	YES
Parent-Year FE	YES	YES
Facility*High Default Prob. FE	YES	YES
Chemical-Year*High Default Prob. FE	YES	YES
Parent-Year*High Default Prob. FE	YES	YES

Table IF8 Robustness tests of Non-air Toxic Releases – land releases

This table reports DID results of the land releases of facilities from 2004-2012 without the year 2008. This is facility-by-chemical-by-year level data. We drop non-RCRA chemicals observations. The dependent variable is Ln(1 + Toxic Land Releases$_{ict}$), where Toxic Land Releases$_{ict}$ equals the amount of facility toxic total releases excluding air and water related releases in chemical *c* released by facility *i* in year *t*. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if facility i's RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. 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. All variables are defined in the Appendix A. Facility-clustered standard errors-based t statistics are reported in parentheses. * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(1+Toxic Land Releases)	Ln(1+ Toxic Land Releases)	Ln(1+ Toxic Land Releases)	Ln(1+ Toxic Land Releases)
Apex × Heavy RCRA Polluters	-0.4876***	-0.0066	-0.5231***	0.0270
	(-3.8391)	(-0.0631)	(-3.7831)	(0.2580)
Ln(Emp)			0.1196	0.0868
			(0.8301)	(0.5525)
Ln(Sales)			-0.0187	-0.0613
			(-0.1391)	(-0.4117)
Constant	3.6365***	3.3908***	3.2877*	4.1020**
	(121.0201)	(124.5550)	(1.8634)	(2.1067)
Observations	34,918	54,261	30,614	47,893
R-squared	0.806	0.746	0.806	0.760
Facility FE	YES	YES	YES	YES
Chemical-Year FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High - Low Default Prob.	0.006***		0.001***	

Table IF9 Robustness tests of Non-air Toxic Releases – defining the Apex time since 2010

This table reports DID results of the Non-air Toxic Releases of facilities from 2004-2012 without the year 2008. This is facility-by-chemical-by-year level data. We drop non-RCRA chemicals observations**.** The dependent variable is Ln(1 + Non-air Toxic Releases$_{ict}$), where Non-air Toxic Releases$_{ict}$ equals the amount of non-air RCRA toxic chemical *c* released by facility *i* in year *t*. *Apex* equals one after the 2009 Seventh Circuit Court decision, i.e., from 2010 onward, and zero before 2010. $Heavy\ RCRA\ Polluters_i$ equals one if facility i's RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. 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. All variables are defined in the Appendix A. Facility-clustered standard errors-based t statistics are reported in parentheses. * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)
Apex × Heavy RCRA Polluters	-0.4254***	0.0101	-0.4380***	0.0436
	(-3.7751)	(0.1021)	(-3.6829)	(0.4369)
Ln(Emp)			0.1057	0.0578
			(0.7674)	(0.3578)
Ln(Sales)			-0.0052	-0.0565
			(-0.0410)	(-0.3619)
Constant	3.8289***	3.7687***	3.3001**	4.5369**
	(190.5165)	(196.1093)	(1.9667)	(2.2226)
Observations	34,918	54,261	30,614	47,893
R-squared	0.799	0.736	0.801	0.748
Facility FE	YES	YES	YES	YES
Chemical-Year FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High - Low Default Prob.	0.008***		0.005***	

Table IF10 Robustness tests of Non-air Toxic Releases – Apex × High Default Prob.

This table reports regression results evaluating how facilities' emission of non-RCRA-regulated toxic pollutants responded to the Apex decision. This is facility-by-chemical-by-year level data. We drop non-RCRA chemicals observations**.** The dependent variable is Ln(1 + Non-air Toxic Releases$_{ict}$), where Non-air Toxic Releases$_{ict}$ equals the amount of non-air RCRA toxic chemical *c* released by facility *i* in year *t*. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. High Default Prob. is equal to one if facilities belonging to firms with probability of failure (measured by Campbell et al. 2008) in December 2007 were larger than industry (NAICS 3-digital code) median and zero otherwise. Heavy RCRA Polluters subsample contains that facility *i*'s RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (NAICS 3-digital code) median, and the Light Polluters subsample includes all others. Regressions (1) and (3) include the sample of Heavy RCRA Polluters. Correspondingly, regressions (2) and (4) include the sample of Light Polluters. All variables are defined in the Appendix A. We report t-statistics based on robust standard errors clustered at the facility level in parentheses. Based on the estimated coefficient p-values (*p*), * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	Heavy RCRA Polluters	Light RCRA Polluters	Heavy RCRA Polluters	Light RCRA Polluters.
Dependent var.	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)
Apex × High Default Prob.	-0.3652***	0.1303	-0.3611***	0.1517
	(-2.8759)	(1.3703)	(-3.4180)	(1.4437)
Ln(Emp)			0.0724	0.0212
			(0.5707)	(0.2400)
Ln(Sales)			-0.0215	-0.0166
			(-0.1801)	(-0.1936)
Constant	-0.3652***	0.1303	-0.3611***	0.1517
	(-2.8759)	(1.3703)	(-3.4180)	(1.4437)
Observations	47,544	42,432	42,298	36,955
R-squared	0.747	0.754	0.753	0.764
Facility FE	YES	YES	YES	YES
Chemical-Year FE	YES	YES	YES	YES
Parent Firm Controls	YES	YES	YES	YES
High - Low Default Prob.	0.000***		0.000***	

Table IF11 Robustness tests of Non-air Toxic Releases – different cluster levels

This table reports the DID results of the Non-air Toxic Releases of facilities from 2004-2012 without the year 2008 with standard error cluster at state level (Panel A) or firm level (Panel B). This is facility-by-chemical-by-year level data. We drop non-RCRA chemicals observations**.** The dependent variable is Ln(1 + Non-air Toxic Releases$_{ict}$), where Non-air Toxic Releases$_{ict}$ equals the amount of non-air RCRA toxic chemical *c* released by facility *i* in year *t*. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if facility *i*'s RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. 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. All variables are defined in the Appendix A. t statistics are reported in parentheses. * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

Panel A. Cluster at the state level

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)
Apex × Heavy RCRA Polluters	-0.4701***	0.0415	-0.5047***	0.0778
	(-3.5484)	(0.3948)	(-3.4712)	(0.8006)
Ln(Emp)			0.1033	0.0606
			(0.9433)	(0.3818)
Ln(Sales)			-0.0053	-0.0585
			(-0.0635)	(-0.4008)
Constant	3.8642***	3.7598***	3.3541***	4.5471**
	(123.2952)	(136.8083)	(2.8906)	(2.4115)
Observations	34,918	54,261	30,614	47,893
R-squared	0.799	0.736	0.801	0.748
Facility FE	YES	YES	YES	YES
Chemical-Year FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High - Low Default	0.004***		0.000***	

Panel B. Cluster at the firm level

Apex × Heavy RCRA Polluters	-0.4701***	0.0415	-0.5047***	0.0778
	(-3.1961)	(0.3746)	(-3.3899)	(0.6844)
Ln(Emp)			0.1033	0.0606
			(0.7106)	(0.4708)
Ln(Sales)			-0.0053	-0.0585
			(-0.0414)	(-0.4089)
Constant	3.8642***	3.7598***	3.3541**	4.5471**
	(111.0525)	(129.8124)	(2.0926)	(2.2593)
Observations	34,918	54,261	30,614	47,893
R-squared	0.799	0.736	0.801	0.748
Facility FE	YES	YES	YES	YES
Chemical-Year FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High - Low Default	0.004***		0.000***	

Table IF12 Robustness tests of Non-air Toxic Releases – missing data zero fill-in

This table reports robust DID results of the Non-air Toxic Releases of facilities from 2004-2012 without the year 2008 with missing data zero fill-in. We fill zero for a facility's missing value in a RCRA toxic chemical release between year t and t+2 when that facility reported any value in that RCRA chemical in t-1 and t+3. This is facility-by-chemical-by-year level data. We drop non-RCRA chemicals observations**.** The dependent variable is Ln(1 + Non-air Toxic Releases$_{ict}$), where Non-air Toxic Releases$_{ict}$ equals the amount of non-air RCRA toxic chemical *c* released by facility *i* in year *t*. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if facility *i*'s RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. 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. All variables are defined in the Appendix A. Facility-clustered standard errors-based t statistics are reported in parentheses. * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)
Apex × Heavy RCRA Polluters	-0.4435***	0.0326	-0.4770***	0.1069
	(-3.5123)	(0.3548)	(-3.5288)	(1.0517)
Ln(Emp)			0.1095	0.0283
			(0.7861)	(0.1753)
Ln(Sales)			-0.0071	-0.0284
			(-0.0553)	(-0.1803)
Constant	3.7816***	3.6850***	3.2726*	4.0764**
	(124.3491)	(152.8578)	(1.9458)	(1.9722)
Observations	35,831	54,770	31,463	48,582
R-squared	0.770	0.715	0.773	0.727
Facility FE	YES	YES	YES	YES
Chemical-Year FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High - Low Default Prob.	0.004***		0.001***	

Table IF13 Robustness tests of Non-air Toxic Releases – continuous RCRA Non-air Toxic Releases during 2004 -2012

This table reports robust DID results of the continuous Non-air Toxic Releases of facilities from 2004-2012 without the year 2008. The sample includes only facility-by-chemical observations that continuously report Non-air Toxic Releases during our sample period. This is facility-by-chemical-by-year level data. We drop non-RCRA chemicals observations**.** The dependent variable is Ln(1 + Non-air Toxic Releases$_{ict}$), where Non-air Toxic Releases$_{ict}$ equals the amount of non-air RCRA toxic chemical *c* released by facility *i* in year *t*. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if facility *i*'s RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. 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. All variables are defined in the Appendix A. Facility-clustered standard errors-based t statistics are reported in parentheses. * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)
Apex × Heavy RCRA Polluters	-0.5589***	0.0920	-0.5674***	0.0849
	(-3.7807)	(0.8859)	(-3.6019)	(0.8379)
Ln(Emp)			0.0907	0.0496
			(0.5314)	(0.3239)
Ln(Sales)			0.0544	-0.0285
			(0.3761)	(-0.1885)
Constant	4.4813***	4.3763***	2.9357	4.7224**
	(120.5684)	(150.2018)	(1.5308)	(2.3851)
Observations	20,319	34,347	17,844	30,166
R-squared	0.844	0.774	0.842	0.784
Facility FE	YES	YES	YES	YES
Chemical-Year FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High - Low Default Prob.	0.000***		0.001***	

Table IF14 Robustness tests of Non-air Toxic Releases - aggregated into facility level

This table reports the DID results of the Non-air Toxic Releases of facilities from 2004-2012 by aggregating data into facility-year level. The dependent variable is Ln(1 + Non-air Toxic Releases$_{it}$), where Non-air Toxic Releases$_{it}$ equals the total amount of non-air RCRA toxic chemicals released by facility *i* in year *t*. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if facility *i*'s RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. 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. All variables are defined in the Appendix A. Facility-clustered standard errors-based t statistics are reported in parentheses. * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)
Apex × Heavy RCRA Polluters	-0.5441***	-0.1948	-0.5590***	-0.0714
	(-3.8513)	(-1.5555)	(-3.5252)	(-0.5368)
Ln(Emp)			-0.1867	-0.0172
			(-1.1850)	(-0.1269)
Ln(Sales)			0.2117	0.0128
			(1.2478)	(0.0851)
Constant	4.6677***	4.3729***	6.7574***	4.5937***
	(194.8763)	(218.1031)	(3.3972)	(2.7049)
Observations	10,027	12,476	8,903	11,060
R-squared	0.925	0.924	0.925	0.928
Facility FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High - Low Default Prob.	0.039**		0.014**	

Table IF15 Robustness tests of Non-air Toxic Releases – aggregated into the firm-chemical level

This table reports DID results of the Non-air Toxic Releases of firms from 2004-2012 without the year 2008 by aggregating data into firm-chemical-year level. This is firm-by-chemical-by-year level data. We drop non-RCRA chemicals observations. Ln(1+Non-air Toxic Releases) is the natural logarithm of one plus the amount of firm RCRA chemical releases excluding air-related releases. Apex equals one which represents the year>=2009. Heavy RCRA Polluters is an indicator variable that equals one when firm i's total RCRA production wastes in the year 2003 to 2007 are larger than SIC 2-digital code industry median and zero otherwise. High Default Prob. includes firms with probabilities of failure (Campbell et al. 2008) at the end of December 2007 being larger than SIC 2-digital code industry median, and the Low Default Prob. includes all others. All variables are defined in the Appendix A. Firm-clustered standard errors-based t statistics are reported in parentheses. * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)	Ln(1+Non-air Toxic Releases)
Apex × Heavy RCRA Polluters	-0.2505**	-0.0044	-0.3228***	-0.1188
	(-2.1646)	(-0.0309)	(-2.7379)	(-0.8656)
Constant	-5.0372	-4.1764	-4.1356	-4.5197
	(-0.6762)	(-0.6789)	(-0.4965)	(-0.7624)
Observations	14,704	20,248	14,295	19,747
R-squared	0.359	0.279	0.633	0.590
Year FE	YES	YES		
Firm FE	YES	YES	YES	YES
Industry-Year FE	YES	YES	YES	YES
Chemical-Year FE			YES	YES
Parent Firm Controls	YES	YES	YES	YES
High - Low Default Prob.	0.041**		0.082*	

Table IF16 Robustness tests of Non-air Toxic Releases – the inverse hyperbolic sine transformation

This table reports the DID results of the Non-air Toxic Releases of facilities from 2004-2012 without the year 2008 by using the inverse hyperbolic sine of total non-air toxic releases. This is facility-by-chemical-by-year level data. We drop non-RCRA chemicals observations**.** The dependent variable is the inverse hyperbolic sine $(f(x) = ln\,(x + \sqrt{1 + x^2}))$ of Non-air Toxic Releases$_{ict}$, where Non-air Toxic Releases$_{ict}$ equals the amount of non-air RCRA toxic chemical *c* released by facility *i* in year *t*. *Apex* equals one after the 2008 Apex District Court decision, i.e., from 2009 onward, and zero before 2009. $Heavy\ RCRA\ Polluters_i$ equals one if facility *i*'s RCRA production wastes during the pre-Apex (2003-2007) period were larger than the industry (NAICS 3-digital code) median and zero otherwise. 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. All variables are defined in the Appendix A. Facility-clustered standard errors-based t statistics are reported in parentheses. * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	IHS(Non-air Toxic Releases)	IHS(Non-air Toxic Releases)	IHS(Non-air Toxic Releases)	IHS(Non-air Toxic Releases)
Apex × Heavy RCRA Polluters	-0.4996***	0.0493	-0.5357***	0.0896
	(-3.9409)	(0.4323)	(-3.9410)	(0.8215)
Ln(Emp)			0.0999	0.0597
			(0.6983)	(0.3402)
Ln(Sales)			0.0016	-0.0607
			(0.0120)	(-0.3589)
Constant	4.2139***	4.1110***	3.5956**	4.9430**
	(140.5111)	(137.9808)	(2.0571)	(2.2322)
Observations	34,918	54,261	30,614	47,893
R-squared	0.798	0.735	0.801	0.746
Facility FE	YES	YES	YES	YES
Chemical-Year FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES
High - Low Default Prob.		0.004***		0.001***

Table IF17 Facility employment and estimated sales

This table reports the impact of Apex Oil ruling on facilities' employment and sales from 2004-2012 without the year 2008. Ln(Emp) (Ln(Sales)) is the natural logarithm of the employment (Sales) of the facility from NETS database. Apex equals one when year>=2009 and set to zero otherwise. Heavy RCRA Polluters equals one which represents the facility's RCRA production wastes from year 2003-2007 are larger than industry (NAICS 3-digital code) median before the Apex Oil ruling and set to zero otherwise. 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. All variables are defined in the Appendix A. Facility-clustered standard errors-based t statistics are reported in parentheses. * denotes $p < 0.1$, ** denotes $p < 0.05$, and *** denotes $p < 0.01$.

	(1)	(2)	(3)	(4)
Subsample	High Default Prob.	Low Default Prob.	High Default Prob.	Low Default Prob.
Dependent var.	Ln(Emp)	Ln(Emp)	Ln(Sales)	Ln(Sales)
Apex × Heavy RCRA Polluters	-0.0720	-0.0816	-0.0583	-0.0677
	(-1.1322)	(-1.6177)	(-0.8956)	(-1.2880)
Constant	5.1209***	5.2760***	17.5500***	17.8340***
	(491.8116)	(647.8272)	(1,645.4554)	(2,101.5258)
Observations	8,873	11,080	8,873	11,080
R-squared	0.931	0.925	0.935	0.929
Facility FE	YES	YES	YES	YES
Parent-Year FE	YES	YES	YES	YES