Tainted beginnings, risky endings: The effect of inadvertent prenatal pollution exposure on CEO risk-taking☆

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Abstract

We examine the impact of prenatal exposure to pollution on CEO risk-taking behavior, focusing on individuals born in areas later designated as Superfund sites, some of the most hazardous waste sites in the U.S. Pollution acts as an exogenous factor influencing CEO risk preferences, independent of parental or CEO decisions. We find that firms led by these CEOs exhibit a clear contrast in policy outcomes: while externally focused financial and investment policies tend to be riskier and fail to deliver higher returns, harming firm performance and CEO tenure, internally focused policies demonstrate efficiency gains, such as higher asset turnover and employee productivity. These CEOs are also more likely to be promoted internally, reflecting the apparent success of their internal risk-taking, which often relies on elements of uncertainty and luck. Once in top executive roles, however, their externally directed risk-taking tends to produce uneven results. Our study sheds light on how exogenous environmental factors shape executive decision-making and career trajectories at the highest levels of corporate governance.

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"*From its origins as a manufacturer of silicon chips and semiconductors, Santa Clara County is riddled with 23 toxic Superfund sites, more than any county in the country. This was news to Ms. Armstrong, who lives a mile from one of the sites … "Most people I talked to in the community seemed unaware of their presence," she said. "Often, even the notion of Superfund sites is foreign to many people. We are used to taking for granted the safety of the environment we inhabit."*

Evelyn Nieves, "The Superfund Sites of Silicon Valley", *The New York Times*, March 26, 2018

"*Mitchell Montgomery said he knew there was something curious about his new home when he moved in last year … in Niagara Falls. When he brushed his teeth, for instance, he sometimes noticed a peculiar smell coming through the drain. It seemed like his 8-year-old son's asthma was getting worse, and his pregnant girlfriend was having occasional nosebleeds and headaches. And a couple of months ago, when he replaced a sump pump in the basement, it was covered in a thick tar-like substance… But none of these things struck him as too suspicious until he realized what was underneath the large, empty swath of grass, sealed off by a tall chain-link fence, just two blocks from his front door. It was Love Canal, the scene of one of the nation's worst toxic-waste catastrophes and now — 45 years later — the site for a new, and sometimes unknowing, generation of homesteaders."*

Jesse McKinley, "His Home Sits Alongside America's First Superfund Site. No One Told Him", *The New York Times*, June 12, 2023

1. Introduction

Chief Executive Officers (CEOs) significantly influence corporate decision-making. Accounting research has shifted from examining broad managerial incentives (Jensen and Meckling, 1976) to analyzing how CEOs' traits affect firm policies. Hanlon, Yeung, and Zuo (2022) suggest that personal characteristics, including preferences, abilities, and experiences, shape individual behavior beyond economic incentives and available information. Studies by Bamber, Jiang, and Wang (2010) and Dyreng, Hanlon, and Maydew (2010), among others, demonstrate that CEOs have a distinct impact on firm policies, that cannot be explained by firm-level factors. Recent literature has explored how CEOs' life experiences explain variations in corporate policies, including taxes, capital structure, and investment decisions.[1]

In this paper, we investigate how pollution exposure affects CEO's risk judgments. While prior research has extensively examined pollution's health impacts, such as effects on infant birthweight, physical health, cognition, hospitalizations, and mortality (e.g., Schlenker and Walker, 2016), we focus on its economic consequences. Recent studies in environmental

[1] Examples of these papers include exposures to severe disease outbreaks (Ru, Yang, and Zou, 2024) and natural disasters (Bernile, Bhagwat, and Rau, 2017), military experience (Law and Mills, 2017), past booms and busts (Schoar and Zuo, 2017), and the Great Depression (Malmendier, Tate, and Yan, 2011).

toxicology and economics have linked pollution to various outcomes, including worker productivity (Graff Zivin and Neidell, 2012; Lichter, Pestel, and Sommer, 2017), investor behavior (Huang, Xu, and Yu, 2020), student performance (Graff Zivin et al., 2020; Persico, Figlio, and Roth, 2020), risk-taking (Yokota et al., 2016), and unethical conduct (Burkhardt et al., 2019; Herrnstadt et al., 2021). We extend this literature by examining how long-term pollution exposure influences CEOs' risk assessments and subsequent corporate decisions.

Studying the impact of pollution on CEO risk judgments is significant for at least three reasons. First, CEOs occupy positions of high socioeconomic status and make critical decisions that substantially affect both firm stakeholders and society at large. Their choices have far-reaching financial and operational consequences, making it crucial to understand factors that may influence their decision-making processes.

Second, previous studies on CEOs' life experiences face significant selection bias issues. While pollution has known biological effects, with neuroscience and epigenetics research showing that adverse experiences can cause lasting behavioral changes (e.g., Lyoo et al., 2011; Labonté et al., 2012), three key selection effects complicate this relationship. The *treatment choice effect* occurs when individuals choose exposure for reasons related to eventual outcomes, such as families relocating during the Great Depression (Malmendier, Tate, and Yan, 2011). Families might have responded to the Great Depression differently, such as by moving to less affected areas. Evidence suggests that Americans move fairly often, so families that choose to relocate may have different risk perceptions than those who stay put.[2] These risk preferences can be passed from parents to their children (Dohmen et al., 2012). Similarly, Bernile, Bhagwat, and Rau (2017) find a non-linear relationship between CEOs' childhood exposure to fatal natural disasters and corporate risk-taking. However, parental risk preferences could influence both CEOs' exposure to natural disasters and risk preferences. While children do not choose to live in disaster-prone areas, their parents' decisions to move there might better explain the CEOs' risk attitudes than their own disaster experiences. Natural disasters like wildfires and tornadoes occur in specific U.S. states, and it is common knowledge among Americans which regions are prone to such events. Thus, it is reasonable to assume that CEOs' parents consider the regular occurrence of natural disasters

[2] See, for example, https://www.jchs.harvard.edu/blog/who-is-moving-and-why-seven-questions-about-residential-mobility. Based on the numbers in this article, around 40 million×14% = 5.6 million Americans typically move across states, and around 12.4 million (40 million × 31%) Americans move away from their counties every year. The mobility rates were double this rate in the 1940s when a significant proportion of current CEOs were born.

when deciding where to raise their children; they might choose to move if they are concerned about risks. The *treatment mitigation effect* arises when some individuals can reduce the negative impacts of formative experiences while others cannot, potentially skewing the results. For example, Malmendier, Tate, and Yan's (2011) results on Depression baby CEOs would be irrelevant to CEOs whose parents were wealthy enough to mitigate the harshest consequences of the Great Depression. Lastly, the *treatment support effect* reflects how social support can buffer individuals from harmful impacts of negative life events (Drageset, 2021; Garcia and Rimé, 2019).[3,4]

Our study aims to isolate the biological effect by examining a likely exogenous event: CEOs born in heavily polluted areas *later* designated as Superfund sites that are among the most hazardous toxic waste sites in the U.S. We refer to these individuals as Superfund CEOs. We argue that this prenatal exposure to pollution influenced CEO risk preferences without being affected by the three selection effects. The exogeneity stems from limited public awareness before the 1980s. Prior to Rachel Carson's publication of "Silent Spring" in 1962,[5] little was known about chemical pesticides' harmful effects, and the first study on exposure to Superfund sites and cancer was published only in the 1980s (Marsh et al., 1988). Public awareness of severe pollution and health threats was minimal until egregious events like the Cuyahoga River fire in 1969, the Love Canal disaster in 1978, the Valley of the Drums chemical waste leak in 1979, and the Camp Lejeune water contamination incident.[6] Before 1980, most people were unaware that they lived near areas that would later be designated as Superfund sites; Figure 2 shows that all but two CEOs in our sample were born when industrial chemicals were not recognized as carcinogens or developmental

[3] Blumstein, Hayes, and Pinter-Wollman (2023) argue that changes in the environment, including the response to extreme weather, fire, or human-created chemicals, influence the adaptive value of sociality, both directly and indirectly, influencing individual fitness.

[4] It is important to recognize that the three selection effects can also have physiological and psychological consequences. The pure biological effect represents the direct impact of the treatment, while selection effects arise from the individual's awareness of the treatment and the resulting behavior changes. Appendix B in the paper summarizes findings from previous literature on early life experiences, detailing which effects drive each finding.

[5] "Silent Spring" was the beginning of the U.S. environmental movement. See "Milestones in EPA and environmental history," available on the EPA website.

[6] Partly to address the problems of these toxic waste, oil, and wastewater dumps, on June 13, 1979, President Carter proposed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to Congress to fund the cleanups of the sites. CERCLA was passed in 1980. The Cuyahoga River was listed as the Krejci Dump Superfund site, the Love Canal was listed as the Love Canal Superfund site, and Valley of the Drums was listed as the A.L. Taylor (Valley of Drums) Superfund site. Both the Love Canal and the A.L. Taylor (Valley of Drums) sites were listed on the Superfund program on September 8, 1983. The Camp Lejeune Military Reservation was listed on the Superfund program on October 4, 1989.

toxicants. Additionally, most pollutants were ground or water-based, which are less noticeable than air-based pollutants. Given this lack of awareness, it is unlikely that Superfund CEOs' parents knew of these dangers. This helps us rule out inherited risk-taking tendencies and the treatment mitigation and support effects.

Finally, medical literature suggests that pollution likely affects risk-taking behavior through long-term biological mechanisms. The fetal origins hypothesis (Barker, 1990) posits that the effects of pollution exposure may remain latent for years, indicating that treatment mitigation is unlikely to be significant in our study. During early fetal development, the blood-brain barrier is immature (Zheng et al., 2003; Grandjean and Landrigan, 2006, 2014; Needham et al., 2011; Lanphear, 2015), leaving the developing brain highly vulnerable to toxicants. Superfund contaminants often include endocrine-disrupting chemicals (EDCs), which severely impact children's neurodevelopment. These effects include impaired inhibitory control, hyperactivity, increased ADHD risk (Guxens et al., 2018; Ke et al., 2021), and reduced serotonin levels (Yokota et al., 2016). Low serotonin is associated with increased aggression and impulsivity. Moreover, medical research links ADHD, impulsivity, hyperactivity, and aggression with a higher propensity for risk-taking (Yokota et al., 2016). These findings support our hypothesis that prenatal exposure to Superfund site pollutants may influence CEOs' risk-taking behavior later in life.

This paper examines how prenatal exposure to toxic chemicals influences Superfund CEOs' risk assessments and decision-making across two key corporate dimensions: external and internal policies. External policies include strategies that affect relationships with capital markets and external stakeholders, while internal policies focus on firm management, operational efficiency, and resource use. We assess how these policies translate into market-based and accounting-based performance metrics and explore their impact on CEO labor market outcomes, such as tenure and turnover. The findings show that Superfund CEOs engage in higher-risk, externally directed activities that, on average, fail to deliver positive returns and harm firm performance. At the same time, these CEOs excel in internal management, achieving higher efficiency in areas like asset turnover and employee productivity. However, their externally focused risk-taking contributes to weaker overall performance and shorter CEO tenures.

Specifically, in terms of external policies, we first show that greater prenatal exposure to Superfund sites is associated with riskier financial decisions. Firms led by Superfund CEOs maintain lower cash reserves, take on higher leverage, and distribute less cash to shareholders

through share repurchases. These CEOs tend to overutilize debt beyond available tax benefits, leading to lower credit ratings, higher bankruptcy scores, and increased default probabilities. The firms also incur higher debt costs, reflected in increased bank loan spreads and bond issue spreads. Shareholders face heightened risk, as seen in greater stock return volatilities, higher idiosyncratic volatilities, more negatively skewed firm-specific returns, larger downside-to-upside volatility ratios, and a higher likelihood of crash weeks. Additionally, these firms generate smaller abnormal returns following M&A announcements and are more likely to undertake unrelated acquisitions.

In contrast, Superfund CEOs show stronger performance in internal policies. These firms achieve higher internal efficiency, characterized by shorter cash conversion cycles, greater asset turnover, and increased employee productivity compared to firms led by non-Superfund CEOs. While their externally focused risk-taking harms overall firm performance, their effective internal management suggests a capacity to drive operational improvements within the firm.

Using Gormley and Matsa's (2014) methodology, we next show that firms led by Superfund CEOs generally underperform on key metrics such as industry-adjusted ROA, Tobin's Q, and stock returns. While their risk-taking sometimes results in high-profile successes, such as leading firms featured on Fortune's *America's Most Admired Companies* list, these instances are exceptions rather than the rule. On average, the negative outcomes associated with their externally focused risk-taking contribute to higher rates of forced turnover and shorter CEO tenures, underscoring the career risks of their management style.

An alternative explanation for these findings is that the observed behaviors may stem from broader cognitive impairments caused by prenatal exposure to pollution, rather than risk-taking alone. Research, such as Ke et al. (2021) and Guxens et al. (2018), suggests that prenatal exposure can affect cognitive development, potentially leading to a wider range of decision-making challenges that could manifest as risk-taking in certain contexts. For example, impaired judgment or reduced cognitive flexibility might lead to suboptimal financial or strategic decisions, which could resemble higher risk tolerance.

However, the stark contrast in outcomes between external and internal policies suggests that risk-taking, rather than cognitive impairment, is the more likely driver of these results. While external policies underperform due to high-risk strategies, internal policies demonstrate clear efficiency improvements, including higher asset turnover and employee productivity. Importantly, the success of internal policies is also likely driven by risk-taking. Executives whose internal risk-

taking yields positive results are more likely to be promoted to CEO, where their externally directed risk-taking often does not pay off. Conversely, executives whose internal risks fail are less likely to advance to the CEO role. This progression highlights a filtering mechanism where only risk-taking executives with a track record of internal success ascend to top leadership. The divergence in results across internal and external dimensions aligns more closely with a pattern of deliberate but high-risk behavior, rather than broad cognitive deficits affecting all areas of management.

Our empirical models control for industry, firm, and CEO characteristics that have been shown to affect risk, performance, and turnover. We find no evidence that Superfund CEOs manage riskier industries, indicating that their higher risk-taking behavior is not industry-driven. Additionally, our regressions include firm, year, industry-year, CEO birth year, CEO birth county, and firm headquarters state fixed effects allowing us to compare outcomes for Superfund and non-Superfund CEOs with similar backgrounds and firm contexts.

Why, then, are these executives selected as CEOs? We argue that the selection of Superfund executives as CEOs can be explained by a combination of factors, reflecting both unintentional and deliberate elements of the process. First, we show that Superfund CEOs are significantly more likely to be promoted internally rather than hired externally, suggesting that firms value their strong internal performance and firm-specific expertise. These executives often excel in implementing risk-taking strategies in internal policies, such as improving operational efficiency or employee productivity, which makes them appealing candidates for promotion. This aligns with findings by Frydman (2019) and Murphy and Zábojník (2007), which highlight the importance of general management skills and internal knowledge in CEO appointments. However, once promoted to CEO, these executives frequently demonstrate weaknesses in managing external stakeholders, leading to high-risk external decisions that harm overall firm performance. Their external risk-taking, unlike their prior internal efforts, does not consistently yield positive outcomes.

Second, firms may recognize the heightened risk-taking tendencies of Superfund CEOs and take steps to mitigate these behaviors. We show that Superfund CEOs receive significantly lower equity-based compensation, measured by delta and vega., suggesting that boards and shareholders attempt to temper excessive risk-taking by reducing incentives tied to risky decisions. This

proactive adjustment in compensation structures indicates some awareness of these CEOs' behavioral patterns, even if not fully accounting for their potential external management challenges.

Third, firms might, in some cases, deliberately select Superfund CEOs to execute high-risk corporate policies. To address this potential reverse causality, we use two approaches. First, employing an instrumental variable (IV) approach, we predict CEO prenatal exposure to Superfund sites independently of firm risk-taking proclivities. Drawing on Yonker (2017), who shows that firms are over five times more likely to hire homegrown CEOs, we hypothesize that companies in states with numerous Superfund sites may inadvertently hire more CEOs with Superfund exposure. Our instrument—the ratio of total births in the county to total births in the state in the CEO's birth year— would only violate the exclusion restriction if firms in areas with more Superfund sites over half a century ago had distinct risk profiles unrelated to CEO prenatal exposure.. We show that these hiring patterns are not driven by distinct risk profiles of firms in areas with more Superfund sites. Second, a difference-in-differences (DID) analysis comparing firm policies three years before and after a CEO's sudden death shows that the effects of Superfund CEOs on firm policies largely reverse following their departure.

These findings suggest that the promotion of risk-taking executives to CEO roles is filtered by their success in internal policies. Superfund CEOs are significantly more likely to be internal candidates, reflecting their strong internal management capabilities and firm-specific expertise. Those whose internal risk-taking yields strong results are promoted, while those whose internal risks fail are not. However, once promoted, these executives may struggle to replicate their internal successes in externally focused policies, leading to uneven firm performance driven by their individual tendencies rather than strategic direction from the board. Where firms anticipate or recognize risk-taking tendencies, they implement controls, such as adjusted compensation structures, to limit potential downsides. Nonetheless, the distinct impacts of Superfund CEOs on firm policies highlight that their decisions are primarily shaped by their own management styles rather than board-driven mandates.

We address concerns about socioeconomic factors such as poverty influencing our results by controlling for county-level conditions at the time of CEOs' births, such as poverty rates, employment, and earnings per capita. Furthermore, while Superfund sites are distributed nationwide, they are concentrated in wealthier states like New Jersey, New York, and California. Moreover, research shows that pollution exposure affects individuals across socioeconomic levels,

with higher-status individuals also residing in high-pollution areas (Forastiere et al., 2007). These factors suggest our findings are not solely driven by socioeconomic effects.

We conduct additional tests to address alternative causal mechanisms driving our results. First, we examine the role of developmental toxicants, finding that our results persist but weaken for sites without such toxicants, underscoring their critical impact on outcomes. Second, we analyze postnatal exposure and find its effects are less pronounced after controlling for prenatal exposure. These findings, consistent with prior research (Ronchetti et al., 2006; Hu et al., 2006; Persico, Figlio, and Roth, 2020), support prenatal pollution exposure as the primary causal mechanism behind the observed behaviors.

We also address potential confounding factors that could influence our findings. First, Superfund CEOs may manage firms near Superfund sites, risking ongoing pollution exposure that could independently affect decision-making. Second, the firm itself may be a current polluter, introducing firm-level effects unrelated to CEO characteristics. Controlling for these factors, including pollution exposure at headquarters or facilities, does not alter the significance of the Superfund exposure variable. Additionally, excluding homegrown CEOs—those born, educated, and managing firms in the same area—does not materially affect our findings, suggesting that cultural factors , as documented by Lei, Petmezas, Rau, and Yang (2023), do not drive our results.

Finally, our results are robust to a battery of robustness tests. First, we match each Superfund CEO with a non-Superfund CEO from a nearby county, born in the same year (or decade), and operating in the same Fama-French (1997) 48-industry classification. Second, we match firms managed by Superfund CEOs to control firms in the same industry and nearby counties, led by non-Superfund CEOs born in the same year (or decade). Our main findings persist in both matched-sample tests. Third, falsification tests using pseudo-randomly assigned CEO birthplaces—either from all U.S. counties or the 10 nearest counties—show that our results lose statistical significance, as expected. Together, these tests confirm the robustness of our finding that prenatal pollutant exposure drives riskier external corporate policies, which generally fail to yield positive returns and harm CEOs' careers.

This study contributes to the literature in three key ways. First, it introduces prenatal exposure to environmental toxins as a novel exogenous factor influencing CEO risk preferences, expanding research on how early-life experiences shape corporate decisions (Bamber, Jiang, and Wang, 2010; Dyreng, Hanlon, and Maydew, 2010; Ru, Yang, and Zou, 2024). Second, it adds to the

environmental literature by showing how historical environmental factors affect corporate leadership and decision-making, emphasizing the financial implications of environmental issues. Third, it highlights prenatal environmental exposure as a previously overlooked factor driving differences in executive decision-making styles across areas like capital structure, risk management, and firm performance.

Our study also expands research on the impact of pollution on corporate decision-making by focusing on the long-term effects of Superfund site exposure, primarily involving water and ground contaminants. While prior studies emphasize the immediate effects of air pollution on financial markets (Heyes, Neidell, and Saberian, 2016; Huang, Xu, and Yu, 2020; Li, Massa, Zhang, and Zhang, 2021), we highlight how prenatal exposure influences CEO risk-taking and decision-making. This complements research on the effects of Superfund sites on financial markets (Harper and Admans, 1996), housing markets (Gayer, Hamilton, and Viscusi, 2000; Greenstone and Gallagher, 2008; Mastromonaco, 2014; Kim, Schieffer, and Mark, 2020; Gamper-Rabindran, Mastromonaco, and Timmins, 2011), regulatory enforcement (Akey and Appel, 2021), health outcomes (Klemick, Mason, and Sullivan, 2020; Currie, Greenstone, and Moretti, 2011), and human capital development (Currie, 2011; Persico, Figlio, and Roth, 2020). Our findings establish a novel link between environmental factors and corporate leadership with cross-disciplinary implications.

Finally, our study distinguishes itself from prior research on pollution exposure by addressing several methodological challenges. Unlike prior work limited to specific regions or periods (Aizer and Currie, 2019; Persico, Figlio, and Roth, 2020), we examine CEOs born from 1912 to 1985, a time when Superfund sites were not widely recognized as health hazards, allowing us to isolate the exogenous impact of prenatal exposure. While earlier studies focused on adolescent outcomes (Sanders, 2012; Persico, Figlio, and Roth, 2020), we extend the analysis to corporate leaders, exploring how early-life exposure influences complex decision-making (Durán and Aguado, 2022). This broadens our understanding of pollution's long-term effects across socioeconomic strata and professional trajectories, complementing our contributions to the accounting literature.

The rest of the paper is organized as follows. Section 2 reviews the federal Superfund program and literature. Section 3 presents our data sources, variable construction, and descriptive statistics. Section 4 presents our primary analyses. Section 5 presents robustness tests and examinations of alternative potential explanations. Section 6 concludes.

2. The federal Superfund program and literature review

2.1. A brief overview of the federal Superfund program[7]

Superfund sites, among the most hazardous contaminated locations in the U.S., encompassing manufacturing facilities, nuclear sites, processing plants, landfills, and mining sites, have been actively polluted for decades during the twentieth century. Under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), the EPA developed a nationwide program to address emergencies, gather and analyze information, identify responsible parties for contaminant releases, and conduct site cleanups. CERCLA also established a trust fund, known as the Superfund, to finance these activities. In 1982, the EPA introduced the Hazardous Ranking System (HRS) to numerically assess each site's potential threat to human health and the environment. Sites with an HRS score of at least 28.5 are eligible for the National Priorities List (NPL). Sites unsuitable for the NPL are given No Further Remedial Action Planned (NFRAP) status, with cleanup managed by states, tribes, and other federal agencies. Superfund sites are classified as proposed NPL, NPL, or deleted NPL according to their listing milestones. Cleaning up Superfund sites is a complex, multi-phase process that takes several years. The first milestone is when a site is labeled "construction complete," indicating that required cleanup tasks are finished.[8] The second milestone, achieved when all public health or environmental threats are addressed, is when the site is deleted from the NPL.

2.2. The fetal origins hypothesis: The effect of in-utero exposure to hazardous waste sites and air pollution on neurodevelopment

The fetal origins hypothesis (Barker, 1990) suggests that the impact of pollution exposure might not be immediately apparent, with lasting consequences that can remain latent for many years. Almond and Currie (2011) argue that the delayed effects of fetal conditions are persistent, manifesting in economic outcomes such as reduced educational attainment and lower wages in adulthood. Margolis et al. (2016) show that prenatal exposure to pollutants leads to long-lasting deficits in self-regulatory capacities, resulting in high-risk behaviors during adolescence. Almond, Edlund, and Palme (2009) and Black et al. (2019) study the effects of prenatal radiation exposure

[7] The history of the Superfund program is available at: https://www.epa.gov/history/epa-history-superfund.
[8] It is important to note that even after completion, all threats are not necessarily neutralized. For instance, once constructed, a groundwater treatment system may need to operate for an extended period to remove all contaminants. Similarly, the source of contamination may have been removed, but the surrounding media could remain toxic, delaying its return to general use.

from the 1986 Chernobyl incident in Sweden and nuclear weapon testing in Norway, respectively, finding significantly lower adult cognitive abilities and earnings. For example, those exposed to the highest quintile of radioactive fallout experienced a 2% decrease in earnings at age 35 compared to those exposed to the lowest quintile during months 3 and 4 of pregnancy. Persico, Figlio, and Roth (2020) demonstrate that prenatal exposure to Superfund sites is linked to significantly lower elementary school test scores and higher behavioral incidents. Aizer and Currie (2019) find that boys born near high-traffic roads with high lead exposure have higher rates of juvenile detention and incarceration, with a 1-unit increase in blood lead levels increasing the probability of such outcomes by 57%.

Relevant to our study, Superfund sites release endocrine-disrupting chemicals (EDCs), which have been associated with several behavioral and neurological disorders during adolescence, including learning and memory impairments, anxiety, delinquent behaviors, aggressiveness, and ADHD (Shoaff et al., 2019; Long et al., 2019; Samon et al., 2023). Tachachartvanich et al. (2018) show that Trichloroethylene (TCE), an EDC, is present at more than 60% of proposed Superfund sites. Fetal development is a critical period of vulnerability, as the developing brain is highly susceptible to EDCs and other contaminants.[9] Raja, Subhashree, and Kantayya (2022) provide a comprehensive summary showing that in-utero exposure to EDCs is associated with permanent alterations to neurobehavioral functions, leading to behavioral disorders in adulthood. Persico, Figlio, and Roth (2020) document the long-term negative impacts of prenatal exposure to Florida Superfund sites on behavioral outcomes.[10] Studies indicate that prenatal exposure to contaminants from the New Bedford Harbor Superfund site, listed on the NPL in 1983, increases risk-taking behavior and hyperactivity in adolescents (Orenstein et al., 2014; Oppenheimer et al., 2022; Vieira et al., 2021). Ke et al. (2021) review epigenetic studies and show that prenatal exposure to heavy metal developmental toxicants, such as arsenic, lead, cadmium, antimony, and methylmercury, found at most Superfund sites and are ranked among the top contaminants on the ATSDR 2022 Substance Priority List, contributes to the risk of ADHD behavior problems in children.

[9] See, for example, the Endocrine Society's position statement at https://www.endocrine.org/advocacy/position-statements/endocrine-disrupting-chemicals.

[10] Although genes influence cognitive disabilities such as learning disabilities, intellectual disability, ADHD, or autism, there is evidence that the development of cognitive disabilities is strongly influenced by the environment (Escudero-Lourdes, 2016; Bellinger, O'Leary, Rainis, and Gibb, 2016). There is also increasing evidence that the developing brain is highly vulnerable to toxic chemical exposure (Grandjean and Landrigan, 2006; Grandjean and Landrigan, 2014; Lanphear, 2015).

Exposure to EDCs can affect fetal brain development through epigenetics or other mechanisms. Herrnstadt et al. (2021) and Nazzari et al. (2023) identify several channels through which pollution increases aggression, impulsivity, and ADHD. First, prenatal exposure to pollutants can alter epigenetic regulation in stress-related genes, such as the serotonin transporter gene in newborns. Second, pollutants can cause neuro-inflammation, affecting dopaminergic pathways. Third, pollution can directly alter brain chemistry by lowering serotonin levels, which is linked to increased aggression and impulsivity (Murphy et al., 2013; Yokota et al., 2016). Perera et al. (2014) and Myhre et al. (2018) show that prenatal exposure to air pollution significantly increases the risk of ADHD behavior problems in children.

Existing literature suggests that ADHD, impulsivity, hyperactivity, and aggression are linked to increased engagement in risky behaviors. Satterfield et al. (2007) conduct a 30-year follow-up survey showing that children with ADHD are at higher risk for adult criminality. Margolis et al. (2016) perform a cohort-based study of children born in New York City and find that prenatal exposure to pollutants leads to long-lasting impairments in self-regulatory capacities, resulting in high-risk behaviors during adolescence. The perceived overestimation of benefits from risk-taking significantly explains the association between ADHD and increased engagement in risky behaviors (Shoham et al., 2016; Shoham et al., 2021).

3. Sample construction, variable definitions, and descriptive statistics

3.1. Superfund sites

We start with a list of 1,803 Superfund sites collected from the EPA's websites as of December 31, 2018.[11] Figure 1 shows that these sites are distributed across all 50 states and the District of Columbia, with a higher concentration in densely populated states such as New Jersey, Pennsylvania, New York, California, Michigan, and Florida.[12] For instance, Silicon Valley, which houses over 2,000 tech companies and the headquarters of over 30 Fortune 1000 corporations, is in California's Santa Clara County. This county has 23 active Superfund sites, more than any other county in the United States. We then collect detailed information about each Superfund site on its

[11] Our list of 1,803 Superfund sites includes 53 proposed sites that were never added to the NPL, 1,338 currently listed sites, and 412 sites that have been deleted from the NPL. Our study uses all three types of Superfund sites, regardless of their current cleanup status. This is because our research focuses on whether CEOs were exposed to hazardous pollutants from these sites during their prenatal period. The latest list of Superfund sites is available here: https://www.epa.gov/superfund/superfund-national-priorities-list-npl.

[12] Figure 1 does not show Superfund sites in the five U.S. territories (Puerto Rico, American Samoa, Commonwealth of Northern Marianas, Virgin Islands, and Guam) and the Federated States of Micronesia.

corresponding EPA website, including the site name, interactive map of the location, EPA ID, HRS score, site size, background information, a complete list of contaminants, and archived key documents such as Records of Decision and administrative records.[13] Crucially, we determine each site's pollutant accumulation period (the period during which contaminants were accumulated) based on the site's background information and archived documents. This allows us to identify whether CEOs were exposed *in utero* to the pollutants from these Superfund sites.

Table IA1 in the Internet Appendix provides summary statistics on the Superfund sites through 2018. Of the 1,803 Superfund sites, 1,463 (81%) were proposed in the 1980s and 1990s, 203 (11%) in the 2000s, and 137 (8%) between 2010 and 2018. The average (mean) HRS score at the time of NPL listing is 43.85, while the median score is 43.70.[14] Due to some large sites such as military bases, nuclear sites, and rivers, the average Superfund site size is substantially larger (6,852 acres) than the median site size (38 acres). The median time from the NPL proposal date to the start of remedial action is about 7.83 years, to the construction completion milestone is 12.36 years, and to the site being deleted from the NPL is 13.69 years. It takes over two decades (median 24.13 years) to reuse and redevelop a site.[15] The three non-mutually exclusive contaminated media at Superfund sites are air, water, and ground.[16] For example, due to gravity or rainfall, liquid contaminants can seep through soil into groundwater. Table IA1 indicates that air-based toxicants are rare (4.88%) at Superfund sites, while toxicants in the ground and water are much more common, reported at 82.03% and 87.97% of sites, respectively.

Our study uses county-level data to examine the effect of prenatal exposure to Superfund sites.[17] This county-level approach follows Kirpich and Leary (2017), Amin, Nelson, and

13 For example, the website homepage for the A.L. Taylor (Valley of Drums) site in Brooks, KY on the EPA website is at: https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0402072.

14 These sites are proposed by the states as their top-priority site and are limited to one per state. According to CERCLA, sites that do not attain the requisite score of 28.5 or do not apply the HRS can be added to the NPL as proposed by the state as its top-priority site and are limited to one per state. There are 23 sites with missing HRS scores and one site with an HRS score below the requisite 28.5.

15 397 sites have their remedial action started dates marked as "not yet achieved," which means that the remedial action has not started yet at this particular site. 598 sites have their construction completion status marked as "not yet achieved." 1,391 sites have their deletion status marked as "not yet achieved." 932 sites have their ready for reuse and redevelopment status marked as "not yet achieved."

16 Ground media consist of debris, landfills, landfill gas, leachate, soil, sediment, sludge waste disposed in underground injection wells, surface impoundments, or spills and leaks released to land. Water media consist of groundwater, surface water, fish tissue, liquid waste, or non-aqueous phase liquids.

17 One alternative to refine our measurement of CEO birth locations could be to use U.S. Census data from 1950, 1940, 1930, and earlier to identify the exact residential addresses of CEOs at birth. While this approach may enhance precision, it has its own limitations. Census records are collected at 10-year intervals, so for CEOs born between Census years, their birth addresses would have to be inferred based on the assumption that their families did not move

McDougall (2018), Davis, McDermott, McCarter, and Ortaglia (2019), and Hubal et al. (2022). To demonstrate the negative impact on infant health, we collect data on infant mortality and low birthweight rates from the U.S. County-Level Natality and Mortality Data, 1915-2007 (Bailey et al., 2016). Panel A of Table IA2 shows the percentage of Superfund infants (infants born in a county with at least one Superfund site during the pollutant accumulation periods) compared to all infants and the proportion for CEOs. Superfund CEOs make up a smaller proportion of all CEOs relative to the proportion of Superfund infants. This could be because Superfund infants are less likely to become CEOs, or CEO families with higher socioeconomic status are less likely to have Superfund infants. We control for the latter by including fixed effects for CEOs' year-of-birth and county-of-birth, as well as the demographic characteristics of the birth county in all models. Panel B (C) compares infant mortality rates (low birthweight rates) between counties with Superfund sites during the pollutant accumulation periods and (1) all counties, (2) counties with Superfund sites during periods before or after the pollutant accumulation periods, and (3) counties without Superfund sites. The key takeaway is that the most negative impact on infant health occurred during the pollutant-generating periods at the Superfund sites. However, we advise caution in interpreting the results from Table IA2, as Schulz (2010) shows that prenatal exposure with long-lasting adult health consequences does not necessarily result in altered birthweight.

3.2. CEO characteristics

We begin with the S&P 1500 firms listed on Execucomp from 1992 to 2018, initially identifying 7,890 unique CEOs. Our CEO birthplace data is sourced from Bernile, Bhagwat, and Rau (2017), and Lei, Petmezas, Rau, and Yang (2023). For CEOs without this data, we manually collect their birthplace and birth year from various sources.[18] This effort yields birthplace information for 3,511 CEOs. Of these, 501 are non-American-born CEOs, 9 have only partial birthplace information, and 3,001 American-born CEOs have complete birthplace records at the

before or after their birth. If this assumption does not hold, it could introduce additional measurement errors. Furthermore, even when Census records provide specific addresses, they do not necessarily confirm prenatal exposure to pollution unless there is independent verification of residential stability and proximity to potential pollution sources during the prenatal period. Consequently, while Census data can complement our current approach, it does not fully resolve the challenges associated with accurately measuring exposure.

[18] Our research draws from a wide range of sources, including Bloomberg People Profiles, Forbes, Conference Board CEO biographies, Legacy.com obituaries, Marquis Who's Who, Standard and Poor's Register of Corporations, Directors and Executives, the U.S. Executive Compensation database on Lexis-Nexis, NNDB.com, Business Week Corporate Elite issues, The Wall Street Journal, Wikipedia, other media coverage, and Google searches. For deceased CEOs, in addition to legacy, we also utilize findagrave.com, courierpress.com, and dignitymemorial.com.

county level. By matching the locations of Superfund sites and their pollutant accumulation periods with the birthplaces and birth years of these American-born CEOs, we identify 734 unique Superfund CEOs and 2,267 non-Superfund CEOs. The ratio of Superfund CEOs to our initial CEO sample is approximately 9%, and it rises to 20.9% when considering only those with birthplace information and to 24.5% among American-born CEOs. We focus on American-born CEOs with complete birthplace records since we cannot verify the pollution exposure of non-American-born CEOs at birth.

Our key explanatory variable, "*CEO #Superfund exposure*," quantifies the number of sites (later designated as Superfund sites) that was actively polluting the CEO's birth county during their birth year.[19] Figure 2 shows the distribution of CEO birth years and their Superfund exposures. Most CEOs in the sample were born long before pollution was widely recognized as an issue, predating the publication of Rachel Carson's "Silent Spring" in 1962. All but two CEOs were born before President Carter proposed the CERCLA to Congress.

To address concerns that other CEO characteristics may influence our findings, we control for several CEO attributes such as age, tenure, duality, founder, outsider, employment contract, ownership, and equity-based compensation (delta and vega). Data on CEO characteristics are sourced from Execucomp, BoardEx, Equilar Consultants, Risk Metrics, and Compustat, with missing data supplemented from SEC filings when available. Detailed descriptions of the variables used in this study can be found in Appendix A.

3.3. Firm characteristics

To illustrate the characteristics of our sample, we present two sets of comparisons in Table 1 and Table IA3. Table 1 compares our sample of Superfund CEOs with non-Superfund CEOs, consisting of 734 unique Superfund CEOs and 2,267 non-Superfund CEOs. Strikingly, Superfund CEOs are typically hired by larger firms compared to their non-Superfund counterparts. Univariate evidence indicates that firms led by Superfund CEOs perform worse in ROA. They tend to adopt riskier external investment policies, evidenced by lower capital expenditures and higher R&D. They also tend to adopt riskier external capital raising policies. This is indicated by lower credit

[19] For instance, General Motors CEO Mary T. Barra was born in 1961 in Oakland County, Michigan, which has five Superfund sites, three of which were polluting before 1961. Therefore, Mary T. Barra is classified as a "Superfund CEO," with a "*CEO #Superfund exposure*" value of 3. This value is calculated based on the number of Superfund sites that was actively polluting Mary Barra's birth county during her birth year. None of these three sites have been deleted from the NPL to date.

ratings, a higher probability of default, and higher equity risk, reflected in greater total and firm-specific stock return risk. Additionally, these firms are less likely to pay dividends. The bottom of the table reveals that, on average, Superfund CEOs were born in counties with lower poverty rates, higher employment rates, and higher earnings per capita, suggesting that lower local socioeconomic status does not drive our results for Superfund CEOs. A two-sample Kolmogorov-Smirnov test shows no significant differences between the Fama–French (1997) 48 industry distributions for our Superfund and non-Superfund CEO samples (results not tabulated),[20] indicating that the results are not due to Superfund CEOs managing firms in riskier industries than non-Superfund CEOs.

Table IA3 compares our sample with firms in Compustat and Execucomp. As expected, since our sample is drawn from Execucomp, our sample firms resemble Execucomp firms more closely than Compustat firms. Additionally, our sample consists of S&P 1500 firms, which are among the largest in Compustat. Table IA3 indicates that, on average, our sample firms are more similar to those in Execucomp than in Compustat. The last column shows that our sample firms are still significantly larger than the typical Execucomp firms. One reason for this could be that CEOs of larger firms attract more media attention, making their birthplace records more readily available.

4. Empirical results: Baseline tests

As discussed in Section 2, prenatal exposure to Superfund sites has long-term effects on neurodevelopment. Specifically, Superfund contaminants may increase aggression, impulsivity, and risky behaviors (e.g., Ke et al., 2021). Therefore, we hypothesize that, all else being equal, CEOs with prenatal Superfund exposure are more likely to exhibit aggressive tendencies in their managerial decisions.

We focus on two key dimensions of corporate policies and their consequences. First, we analyze externally focused policies, such as risk-taking decisions that affect relationships with capital markets and external stakeholders, and evaluate how these translate into market-based and accounting-based performance metrics. Second, we examine internally focused policies related to operational efficiency and resource management. Finally, we assess how the CEO labor market

[20] In our CEO sample, the top ten industries for Superfund CEOs, as per Fama–French (1997) 48 industry classification, are business services (13.1%), retail (11.5%), electronic equipment (6.8%), communication (6.4%), petroleum and natural gas (6.O%), pharmaceutical products (5.1%), computers (4.8%), transportation (4.8%), automobiles and trucks (4.3%), and chemicals (3.9%). In contrast, the top ten industries for non-Superfund CEOs are business services (10.6%), retail (8.4%), petroleum and natural gas (5.8%), electronic equipment (5.3%), communication (5.0%), computers (4.8%), chemicals (4.2%), transportation (4.0%), pharmaceutical products (3.9%), and machinery (3.8%).

responds to the overall performance and decision-making associated with these external and internal policies.

Therefore, the dependent variables in our baseline models are the risk-taking policies related to external capital raising, financial performance, and CEOs' career outcomes, respectively, for firm *i* in year *t*. We regress these variables on whether firm *i* is managed by a Superfund (or non-Superfund) CEO *j* and a vector of control variables *k* measured in year *t*-1. To account for unobservable firm heterogeneity in the dependent variables and possible time trends, all baseline models include firm, state of the firm's corporate headquarters (HQ), and year fixed effects. Additionally, to account for changes in the types of newborns in the county over time and potential CEO age and cohort effects, the baseline models also include CEO birth year and birth county fixed effects. All standard errors are clustered by CEO-firm and year.

4.1. CEOs' prenatal exposure to Superfund sites and external risk-taking policies

4.1.1. The firms' capital structure policy

We begin our analysis by testing whether Superfund CEOs make more aggressive external financial decisions, measured by the cash-to-asset ratio, leverage ratio, and the natural log of one plus the amount of cash returned to shareholders through share repurchases. We focus on share repurchases instead of dividends because the former are generally discretionary while the latter are sticky. Table 2 presents the results. In all specifications, we include lagged CEO and firm characteristics similar to those in Bates, Kahle, and Stulz (2009), Custódio and Metzger (2014), and Bernile, Bhagwat, and Rau (2017). Consistent with our hypotheses, Table 2 shows that *Ln*(1+ *CEO #Superfund exposure*) is positively associated with leverage and negatively associated with the firm's cash holdings and the amount of repurchases. Economically, *ceteris paribus*, firms managed by a CEO born in a county with one polluting Superfund site have a 1.32% (= −0.0191×Ln(2)-Ln(1)) lower cash-to-assets ratio and a 3.13% (=0.0451× Ln(2)−Ln(1)) higher leverage ratio compared to firms managed by non-Superfund CEOs. These effects are comparable to those documented by Bernile, Bhagwat, and Rau (2017) that firms managed by CEOs with medium disaster fatality experience have 1% lower cash holdings and a 3% higher leverage ratio (Appendix B) and to Cain and McKeon (2016) for CEOs with private pilot licenses. Our average sample firm has a leverage of 21.2%, implying that Superfund CEOs are associated with a 14.8% (3.13%/21.2%) higher firm leverage, on average. Cain and McKeon (2016) report that pilot CEOs

have an 11.4% higher firm leverage at the median. The results for the control variables are also consistent with those from the referenced prior studies.

Is the debt accrued by the Superfund CEOs beneficial for the firm? We compute the kink defined by Graham (2000) and Malmendier, Tate, and Yan (2011) to address this question. The kink is the ratio of the hypothetical level of interest at which the expected marginal tax-shield benefits of debt begin to decline (numerator) to the actual amount of interest paid (denominator). If the kink exceeds one, the firm could increase its interest expense and still receive full benefits from these additional tax deductions, indicating a conservative use of debt. If the kink is less than one, the firm earns reduced tax benefits on the actual interest expenses, suggesting that the firm has excessive debt relative to the available tax benefits.

Table IA4 presents the results using the kink as the dependent variable, including lagged CEO and firm characteristics similar to those in prior studies. Since the kink is left-censored at 0 and right-censored at 8, Table IA4 reports coefficients from a Tobit model in column 1. However, a general drawback of the Tobit model with fixed effects is the well-known incidental parameters bias in the coefficient estimates (Greene, 2004). Therefore, column 2 reports coefficients from an OLS model. In both models, the coefficients on *Ln*(1+ *CEO #Superfund exposure*) are significantly negative at the 1% level, indicating that firms managed by Superfund CEOs tend to issue excessive debt. Economically, ceteris paribus, firms managed by a CEO born in a county with one polluting Superfund site have a kink reduction of 0.82 (−1.1758 × Ln(2) − Ln(1)), which represents a 16% decrease from the sample mean kink of 5.002. This effect of Superfund CEOs on kink is similar in magnitude but opposite to the Depression Baby CEO effect reported by Malmendier, Tate, and Yan (2011). The impact is likely to be greater if the CEO was exposed to multiple polluting Superfund sites *in utero*.

4.1.2. The credit risk and cost of borrowing

From the external stakeholders' perspective, if the debt issued by Superfund CEOs is excessive or exhausts their firms' debt capacities, it should negatively impact the firms' credit risk and borrowing costs. Table IA5 details how firm credit ratings and default risk are influenced by Superfund CEOs.

We obtain credit ratings from the Compustat Standard & Poor's (S&P) Rating database, where a rating of 0 corresponds to D and 24 corresponds to AAA. Since the S&P Rating database was discontinued after February 2017, we supplement the missing data and post-February 2017 data

using the Mergent Fixed Income Securities Database (FISD), which includes bond credit ratings from S&P, Moody's, Fitch, and Duff & Phelps. We convert the ratings from these other agencies to match the S&P rating scale.

Column 1 of Table IA5 presents estimates from an Ordered Probit model, showing that firms managed by Superfund CEOs have significantly lower credit ratings, consistent with our earlier findings. Column 2 examines the likelihood of receiving a junk rating (i.e., S&P domestic long-term issuer credit ratings or converted ratings from other agencies are below BBB−), finding no significant effect of Superfund CEOs on this probability. In the last two columns, we show that firms managed by Superfund CEOs have significantly higher bankruptcy scores, according to Zmijewski (1984), and higher estimated default probabilities based on the KMV-Merton (1974) model (Bharath and Shumway, 2008).

Next, Table 3 reports estimates of whether firms with Superfund CEOs are associated with a higher cost of borrowing, using three measures: (1) interest expenses scaled by total debt, (2) bank loan all-in spread, defined as the spread over LIBOR for new bank loans, and (3) bond issue spread, defined as the yield-to-maturity for newly issued bonds minus the yield for U.S. Treasuries of equivalent maturity. We gather bank loan data from the DealScan database and bond issue data from the Mergent Fixed Income Securities Database (FISD). Following Ivashina (2009) and Drucker and Puri (2009), columns (2) and (3) control for various loan/bond contract characteristics, with each observation corresponding to a specific loan or bond issue. The bank loan all-in spread regression also includes lead lender fixed effects.[21] Additionally, columns (2) and (3) control explicitly for firm leverage and credit ratings. Therefore, the estimated impact of Superfund exposure on the cost of borrowing is incremental to the effects on firm leverage and credit rating. This is particularly significant given our earlier findings of a strong relationship between leverage ratio, credit risk, and CEOs' prenatal Superfund exposure.

Using interest expense/debt as the dependent variable, column (1) shows no significant effect of Superfund CEOs. This may be because interest expenses for total debt can arise from debt issued long before the current CEOs took their position. Therefore, we next focus on new bank loans or newly issued bonds in the current fiscal year, which allows a direct link between the cost of

[21] For loan deals with multiple facilities, we use loan characteristics of the largest tranche with the earliest active date. We use the variable LeadArrangerCredit in the DealScan database to identify if a lender is also a lead arranger. We include all loans with at least one lead arranger in our sample. For loan deals with multiple lead arrangers, we have one observation corresponding to each lead arranger.

borrowing and the CEO in charge at the time of issuance. Columns (2) and (3) show that firms led by Superfund CEOs have higher bank loan all-in spreads and bond issue spreads, respectively. Economically, *ceteris paribus*, firms managed by a CEO born in a county with one polluting Superfund site pay an additional 11.65 basis points for bank loans and 64.43 basis points for bond issues compared to firms managed by non-Superfund CEOs. These Superfund CEO effects are similar to, but somewhat weaker than, those observed for CEOs with medium disaster fatality experience documented by Bernile, Bhagwat, and Rau (2017) (Appendix B). Overall, the evidence from these tables supports medical research linking prenatal exposure to Superfund pollution to aggression.

4.1.3. Equity risk

From the shareholder's perspective, we examine whether aggressive managerial decisions lead to higher equity risk, measured by the annualized total stock return volatilities ($\sigma_{Stock\ return}$), the annualized firm-specific (idiosyncratic) stock return volatilities ($\sigma_{Specific\ return}$), and three proxies for the stock's vulnerability to firm-specific extreme adverse price movements. Column (1) of Table 4 shows that, all else being equal, firms managed by a CEO born in a county with one polluting Superfund site have a 5.4% increase in $\sigma_{Stock\ return}$ compared to firms managed by non-Superfund CEOs, from a sample mean of 0.3902. For comparison, Cain and McKeon (2016) report that pilot CEOs are associated with increases in $\sigma_{Stock\ return}$ ranging from 2.20% to 3.5%. Column (2) shows an insignificant relation for $\sigma_{Specific\ return}$, calculated using an expanded index model regression with contemporaneous, two leads, and two lags for the market and industry indexes (Hutton, Marcus, and Tehranian, 2009; Kim, Li, and Zhang, 2011; Xu, Xuan, and Zheng, 2021).

Next, we test the robustness of our findings using alternative measures of idiosyncratic risk, focusing on the stock's vulnerability to firm-specific extreme adverse price movements. We use three proxies: (1) negative skewness in firm-specific returns, (2) the ratio of firm-specific volatilities in down weeks to those in up weeks, and (3) the frequency of firm-specific crashes (defined as firm-specific weekly returns falling 3.09 standard deviations below the annual mean). These specifications include control variables similar to those used in Hutton, Marcus, and Tehranian (2009), Kim, Li, and Zhang (2011), and Xu, Xuan, and Zheng (2021). Columns (3) to (5) show that the presence of a Superfund CEO appears to increase firms' stock vulnerability to extreme adverse stock price movements.

4.1.4. Acquisition activity

Existing studies suggest that CEO hubris, characterized by an overly optimistic belief in takeover gains, drives unrelated and/or unprofitable acquisitions (Roll, 1986). Additionally, the personality traits literature indicates that hubris is linked to higher levels of impulsivity and aggression (Carver, Sinclair, and Johnson, 2010). Corporate acquisitions are inherently riskier than internal growth due to the substantial commitment of resources, which can lead to significant financial losses. Therefore, in our next set of tests, we investigate whether Superfund CEOs are associated with unprofitable and/or unrelated acquisitions.

We obtain merger and acquisition (M&A) announcements involving U.S. public acquiring firms between 1992 and 2018 from the Securities Data Corporation's (SDC) U.S. Mergers and Acquisitions database. After excluding buybacks, share repurchases, self-tenders, and spinoffs, we are left with 13,719 M&A announcements for 6,630 acquirer-year observations. Each observation in Table 5 corresponds to an individual M&A announcement. To assess whether Superfund CEOs are associated with unprofitable M&A, we calculate the acquirer's cumulative abnormal returns (CAR) from day −1 to day +1 relative to the M&A announcement (day 0). This calculation is based on market model regressions of daily stock returns on the CRSP value-weighted market index, using an estimation period from day −131 to day −31. We also calculate CARs using the Carhart (1997) four-factor model and apply standard event study methods. For acquirers managed by Superfund CEOs, the average market model CAR(-1, +1) is 0.088% with a t-value of 1.04, while for acquirers managed by non-Superfund CEOs, it is 0.2435% with a t-value of 4.89.

Table 5 Columns (1) and (2) show that acquirers with Superfund CEOs have lower CAR(-1, +1), even after controlling for acquirers, acquirer CEOs, and M&A deal characteristics. To assess whether Superfund CEOs are associated with unrelated M&A, column (3) uses a probit model and shows that firms managed by Superfund CEOs are more likely to announce unrelated acquisitions, as identified by the Fama-French (1997) 48 industry classification. As described earlier, a general drawback of the nonlinear (such as probit) model with fixed effects is the well-known incidental parameters bias in the coefficient estimates (Greene, 2004). Therefore, Table 5 also includes results from an OLS regression with fixed effects (column 4). Our findings on acquisition activity are economically comparable to those in previous studies (e.g., Bernile, Bhagwat, and Rau, 2017) (Appendix B).

4.2. CEOs' prenatal exposure to Superfund sites and internal firm policies

Table 6 demonstrates that firms managed by Superfund CEOs consistently outperform those led by non-Superfund CEOs in key measures of internal efficiency. Specifically, these firms exhibit lower cash conversion cycles, measured as the time taken to convert investments in inventory and receivables into cash through sales, indicating better management of working capital through faster inventory turnover and more efficient receivables and payables processes. Additionally, they achieve higher asset turnover, defined as the ratio of net sales to average total assets, reflecting more effective utilization of assets to generate revenue. Employee productivity, measured as total revenue per employee, is also significantly higher, suggesting that these CEOs implement strategies that optimize workforce performance and resource allocation. Together, these results highlight the strong internal management capabilities of Superfund CEOs, which stand in contrast to the underperformance associated with their externally focused risk-taking behaviors.

4.3. Market-based and accounting-based firm performance metrics

The literature shows that prenatal exposure to pollution has long-lasting effects on adult performance (e.g., Raja, Subhashree, and Kantayya, 2022; Oppenheimer et al., 2022). To investigate whether CEOs' prenatal exposure to Superfund sites negatively affects firm performance compared to industry peers, we avoid using industry-adjusted performance measures due to the concerns about inconsistent estimates raised by Gormley and Matsa (2014). Instead, we use unadjusted ROA, Tobin's Q, and stock returns as dependent variables and include interactions of industry with year fixed effects. In all specifications in Table 7, we control for potential CEO mobility restrictions using a state-level noncompetition enforceability index (Garmaise, 2011), local labor market opportunities for CEOs (Jochem, Ladika, and Sautner, 2018), and product market competition using product market similarity based on TNIC (text-based network industry classifications) (Hoberg and Phillips, 2016). Across all three firm performance measures, we find that Superfund CEOs indeed hurt firm performance.

Table 7 shows that, on average, the external policies implemented by Superfund CEOs fail to deliver positive results. However, their risk-taking should lead to notable successes if the risks pay off. To explore this further, we examine the likelihood of Superfund CEOs leading prestigious companies ranked in the top 50 of Fortune's "America's Most Admired Companies (MAC)" list. As shown in Table IA6, Superfund CEOs are more likely to lead firms featured in

the MAC list and achieve higher rankings, suggesting that while their external risk-taking often underperforms, it can sometimes result in high-profile achievements.

Mitchell and Lehn (1990) argue that bad bidders often become attractive takeover targets themselves. In the same vein, we investigate whether the poor performance of firms managed by Superfund CEOs results in takeovers or general delisting events. To address this, we run Cox proportional hazards models, defining a failure event as when the firm receives a takeover, is taken over, or is delisted from the stock exchange due to liquidation, bankruptcy, or other financial reasons during the CEO's tenure. Duration is the time to the failure event, measured as the number of years from becoming CEO to the event or right-censoring without an event during the sample period. Table IA7 reports the results. CEO Superfund exposure is significantly positively related to the hazard ratio of receiving a takeover (column 1), being taken over (column 2), or being delisted from the exchange due to financial reasons (column 3). This result holds whether or not we include year, industry, and firm headquarters state fixed effects.[22]

So far, we have documented various effects on firms managed by Superfund CEOs. The next natural question is whether a common factor drives these effects. For instance, if a firm consistently makes poor acquisitions, this could increase its cost of debt and equity volatility and decrease performance. To test this, we repeat all previous analyses, excluding firm-years with mergers or acquisitions. The effect of Superfund CEOs persists and is even stronger in most regressions. Similarly, it is plausible that poor internal investment decisions could negatively affect NPV. We eliminate all firm-year observations in the highest annual decile of growth in net PP&E (net property, plant, and equipment, scaled by total assets). Again, the Superfund CEO effect remains significant (results not shown for brevity).

4.4. CEO career outcomes

Given that CEOs' prenatal exposure to Superfund sites negatively affects their performance on average, we expect Superfund CEOs to have shorter tenures and a higher risk of forced turnover. Columns (1) and (2) of Table 8 confirm this expectation. These results hold even after controlling for local labor market opportunities for CEOs, restrictions on CEO mobility, industry performance (Jenter and Kanaan, 2015), industry volatility (Peters and Wagner, 2014), and CEO equity-based compensation (delta and vega).

[22] Since the number of failure events is relatively small, we cannot run Cox proportional hazards models with year, industry, firm headquarters state, CEO birth year, and CEO birth county fixed effects.

Next, we test the robustness of our findings on forced CEO turnover. If generic CEO turnover events, such as retirements at traditional retirement ages, are not driven by poor firm performance, we would expect no difference in the likelihood of these events between Superfund and non-Superfund CEOs. Additionally, severance pay for departing CEOs is typically determined by pre-established employment contracts rather than by the firm's performance at departure (Rau and Xu, 2013). Columns (3) and (4) show that the coefficient estimates for Superfund CEOs are indistinguishable from zero, supporting the idea that Superfund CEOs are not more likely to be dismissed without cause.

Taken together, we demonstrate that Superfund CEOs take more risks without corresponding payoffs, negatively affecting their careers. Additionally, we compare our findings with recent studies on CEOs' early-life experiences and personal risk-taking, showing that our results are similar in both economic and statistical significance (see Appendix B).

4.5. Where do Superfund CEOs come from?

A natural question arises: why do boards hire these Superfund CEOs? We argue that the selection of Superfund executives as CEOs can be explained through a combination of factors, reflecting both unintentional and deliberate elements of the process.

4.5.1. Internal vs. external candidates

First, firms may be unaware of their CEOs' tendencies toward risk-taking, particularly when promoting internal candidates, a process often influenced by the perceived success of internal policies. These successes, however, may partially depend on luck, as risk-taking strategies inherently involve uncertainty. Cheng, Groysberg, Healy, and Vijayaraghavan (2021) find that corporate directors often view their boards as less effective in planning for CEO transitions, while Keusch (2023) highlights frictions in matching CEOs to firms. Externally hired CEOs may be easier to evaluate because their transferable general management skills, such as engaging with institutional investors, media, and analysts, are more visible. Frydman (2019) and Murphy and Zábojník (2007) note that, over the past three decades, firms have increasingly prioritized these external-facing skills over firm-specific knowledge, which holds value only within the organization. Supporting this, Gopalan, Milbourn, and Song (2010) argue that externally appointed CEOs tend to be more talented than those promoted internally, as their ability to succeed despite limited firm-specific knowledge signals their strength in managing external relations. By contrast,

internal promotions often reflect past success in internal policies, which may obscure the role of luck and leave firms underestimating the associated risks when these executives take on broader responsibilities as CEOs.

We, therefore, investigate whether Superfund CEOs are more likely to be internal candidates than external ones. Table 9 Column 1 presents probit regression results using an outside CEO indicator (which equals one if the individual joined the firm and became CEO within two years, and zero otherwise) as the dependent variable, including departing CEO and firm characteristics similar to those in Dahya and McConnell (2005) and Marshall, McCann, and McColgan (2014). Column 1 shows that Superfund CEOs are significantly more likely to be hired from within the firm, suggesting that they often take the top position without being tested externally or held solely accountable for the entire company. This indicates that their aggressive management philosophies may go unnoticed during their rise up the corporate hierarchy until they assume the CEO role.

We also examine if these CEOs are more likely to be promoted within family firms, where the incentives may focus on preserving family interests rather than maximizing shareholder value and tend to have weaker governance structures. Column 2 presents probit regression results using a family firm indicator (which equals one in firm-years where members of the founding family hold positions in top management, are on the board, or are blockholders of the company) as the dependent variable and shows that Superfund CEOs are significantly more likely to work in family firms than non-Superfund CEOs. Columns 3-5 analyze the interaction between the Superfund exposure variable and the family firm indicator to predict the likelihood of hiring an outside CEO within family firms. In all three specifications, Superfund CEOs remain significantly less likely to be externally hired CEOs. However, the interaction term is significantly positive only when members of the founding family hold non-executive positions, meaning that they are on the board or are blockholders but are not involved in managing the company (Column 4). Conversely, the interaction term is insignificant when members of the founding family hold top management positions (Column 5). This indicates that family firms are more likely to promote executives with Superfund exposure from within the firm only when family members hold non-executive positions but not when family members hold executive roles.

4.5.2. Do firms know of the risk-taking proclivities of Superfund CEOs?

Second, firms may recognize the heightened risk-taking tendencies of Superfund CEOs and take steps to mitigate these behaviors through adjustments to their equity-based compensation.

Specifically, Superfund CEOs are likely to be granted lower delta, which measures the sensitivity of their equity-based pay to stock price changes, and lower vega, which reflects the sensitivity of option values to stock return volatility. These reductions aim to discourage excessive risk-taking by limiting incentives tied to equity risk. Unlike typical CEOs, Superfund CEOs do not need additional motivation to pursue risk-increasing positive NPV projects, making these adjustments an effective way to curb their propensity for high-risk decisions. Additionally, firms may reduce the overall value of option grants as a share of total compensation. These measures indicate that boards are aware of the CEOs' behavioral patterns and make deliberate efforts to temper these risk-taking tendencies while maintaining alignment with shareholder interests.

Columns (1) and (2) of Table 10 show that Superfund CEOs are associated with lower delta and vega, consistent with the conjecture that firms recognize their propensity for risk-taking and accordingly reduce incentives for such behavior. However, column (3) shows that the proportion of option value as a percentage of total compensation is not statistically significant.

4.5.3. CEO-firm risk-matching concerns: Instrumental variable (IV) estimation

Third, firms might choose Superfund CEOs precisely because they want their CEOs to take more risks. Ideally, we would randomly assign CEOs with prenatal exposure to firms and then test for differences in firm outcomes, but this approach is impractical. Nevertheless, we identify an IV that predicts CEO prenatal exposure to Superfund sites independent of firm risk-taking outcomes. Drawing on Yonker (2017), who shows that firms are over five times more likely to hire homegrown CEOs, we hypothesize that corporations in states with a high density of Superfund sites might inadvertently be more likely to hire CEOs with Superfund exposure. Our instrument for *Ln*(1+*CEO #Superfund exposure*) is the ratio of total births in the county to total births in the state in the CEO's birth year. This instrument is unlikely to violate the exclusion restriction, as it is improbable that firms in regions with an elevated number of Superfund sites over half a century ago had distinct risk profiles for reasons unrelated to CEO prenatal exposure.

We employ a 2SLS analysis using this IV. In the unreported first stage, the instrument is significantly and positively related to *Ln*(1+*CEO #Superfund exposure*) at the 1% level. Table 11 presents the results from the second-stage models, showing the effect of predicted *Ln*(1+*CEO #Superfund exposure*). We use the Cragg and Donald (1993) Wald F-statistic to test the strength of the instrument. All the F-statistics, except for bank loan all-in spreads, strongly reject the null hypothesis of a weak instrument. The IV estimated results generally align with the corresponding

baseline regressions, and their magnitudes tend to increase, indicating a causal effect of a CEO's prenatal exposure to Superfund sites on firm outcomes.

4.5.4. CEO-firm risk-matching concerns: Difference-in-differences (DID) analysis on CEOs' sudden deaths

Instead of imprinting their management styles, CEOs could be appointed to implement board-chosen policies. To address the reverse-causality explanation, we use CEOs' sudden deaths as exogenous CEO turnover events and perform a difference-in-differences (DID) analysis. If there is a causal relationship between Superfund CEOs' prenatal exposure and their aggressive managerial decisions (and poor performance), we would expect their successors to reverse these decisions in the years following the sudden deaths of the Superfund CEOs. Conversely, if the CEOs are appointed to implement board-chosen policies, we may not expect such decision reversals. Following Fracassi (2017), we collect CEOs' sudden death events from major newspaper databases (ProQuest newspapers, Factiva, and Google News Archive) and articles published on the internet.[23] These exogenous CEO turnover events allow us to mitigate concerns that policy dissimilarity occurred because the CEO was replaced following poor performance.

To address reverse-causality concerns, we use the sudden deaths of Superfund CEOs as the treated group and those of non-Superfund CEOs as the control group. We record the deceased CEO's prenatal Superfund exposure as *Ln*(1+*deceased CEO #Superfund exposure*). We compare firm-year observations for the three years before (pre-treatment period) and three years after (post-treatment period) the CEO's death. The variable *Post CEO demise* (0,1) is set to one for the three years after the CEOs' deaths and zero otherwise. The main coefficient of interest is the interaction term (*Post CEO demise* (0,1) × *Ln*(1+*deceased CEO #Superfund exposure*)).

Table IA8 reports the results of the DID analysis.[24] In almost every case, the signs of the coefficients for the interaction term reverse from the previous baseline results (except for acquisitions and CEO tenure) and remain significant. The DID analysis shows that following the Superfund CEOs' sudden deaths, compared to non-Superfund CEOs' sudden deaths, the new

[23] The cause of death of the CEO is indicated as a heart attack, stroke, plane crash, car, boating, mountain accident, cancer within a year of diagnosis, and other similar unexpected death events.

[24] The test for CEOs' forced turnover is not feasible because the model did not converge. We use industry-adjusted ROA, Tobin's Q, and stock returns as the dependent variables due to insufficient observations to include interactions of industry with year fixed effects.

CEOs tend to adopt different corporate policies. This suggests that prenatal Superfund exposure has a causal effect on changes in corporate policies.[25]

5. Additional empirical analyses

In this section, we address other plausible explanations. We first examine if the Superfund CEOs' corporate policies are a manifestation of their overconfidence. Second, we focus solely on the exposure to the developmental toxicants released by Superfund sites, which we conjecture is the primary channel harming fetal neurodevelopment, as the fetal brain is highly vulnerable to chemical toxicity (e.g., Black et al., 2019). Third, we examine if the CEOs' postnatal exposure to Superfund sites up to adolescence and CEOs' current exposure to pollution at work have incremental impacts beyond their prenatal exposure. Fourth, we perform a battery of robustness tests. Finally, we perform two matched-pair sample analyses and two falsification tests to consolidate our main results.[26]

5.1. Are Superfund CEOs overconfident CEOs?

While our results suggest a causal link between prenatal exposure to pollutants and CEO risk-taking, another explanation is that the observed risk-taking behavior might manifest as CEO overconfidence (Malmendier and Tate, 2005). Overconfident CEOs may overestimate their abilities and the likelihood of positive outcomes, leading to risky decisions. If Superfund CEOs' risk-taking is primarily driven by overconfidence, interventions to correct cognitive biases may be more appropriate than those addressing external environmental factors. Therefore, we investigate whether overconfidence, rather than the direct biological impact of pollution exposure, is the primary driver of the observed risk-taking behavior.

To measure overconfidence, we use the Holder 67 measure from Malmendier and Tate (2005). Holder 67 is a dummy variable that equals one if CEOs fail to exercise their executive stock options after the stock price exceeds the option exercise price by more than 67% at least twice during the sample period. We expect positive coefficients on the Superfund exposure if Superfund CEOs are overconfident. Columns 1-3 of Table IA9 show the opposite findings: a

[25] The results are mostly similar, albeit slightly weaker, if we examine the change from the two years before to two years after the CEO's demise. We cannot examine the change from one year before to one year after the CEO's demise since the number of observations is less than the number of explanatory variables including the fixed effects.

[26] The results, reported in the tables in the Internet Appendix, present kink regression results using an OLS (instead of a Tobit) specification and unrelated acquisitions (0,1) regression results using an OLS (instead of a probit) specification.

significant negative relationship between CEO Superfund exposure and Holder 67. This finding suggests that the risk-taking observed in Superfund CEOs is likely driven by factors related to their prenatal exposure to environmental toxins rather than cognitive biases like overconfidence.

5.2. Are the results driven by developmental toxicants released from Superfund sites?

The fetal origins hypothesis argues that *in-utero* exposure to developmental toxicants has long-term consequences on neurodevelopment. However, prenatal exposure to toxicants *not* classified as developmental toxicants can also lead to chronic diseases in adulthood, such as cancers (e.g., Young and Cai, 2020). Therefore, prenatal exposure to these non-developmental toxicants could also be influencing our results.

Each Superfund site contains numerous contaminants, that are detailed in the health and environment section of the site's homepage. This section lists all Superfund chemicals released from the site, including the names of contaminants, their contaminated media, chemical abstracts service registry numbers (CASRN), and Agency for Toxic Substances and Disease Registry (ATSDR) toxicological profiles. We identify developmental toxicants based on their critical effects on human body systems as assessed in the EPA's Integrated Risk Information System (IRIS)[27] and developmental toxicity studies in laboratory animals.[28] To determine whether a Superfund site releases developmental toxicants, we match each site's contaminants using their 10-digit CASRN with their developmental toxicity risk assessment. As described in section 3.1, we identify each Superfund site's pollutant accumulation period from archived documents. However, these documents do not specify each toxicant's accumulation period. Therefore, we assume that the complete list of Superfund chemicals was accumulated and released simultaneously.

In Table IA10, we run regressions at the CASRN chemical level. Our primary explanatory variable is an indicator variable, *Developmental toxic chemical* (0,1), which equals one if the

[27] The list of chemicals in the IRIS database and its assessed critical effect on human body systems are available at https://iris.epa.gov/AtoZ/?list_type=alpha. The IRIS summary icon contains each chemical's IRIS chemical toxicity assessment summary.

[28] The EPA published guidelines for studying developmental toxicity in 1991 (USEPA (1991)). However, as the fields of toxicology and risk assessment continued to develop, early versions of the guidance document were later revised. Moreover, several chemicals were found to cause developmental toxicity in experimental animal studies. In most of these cases, the toxic effects of the chemical on human development have not been studied; hence, there is no clear evidence of hazards in humans. Among 573 chemicals listed in the IRIS database, the IRIS toxicological review or supporting document is unavailable for 468 (82%=468/573) listed chemicals. Therefore, in addition to the IRIS, we identify developmental toxicants based on developmental toxicity studies in laboratory animals.

contaminants are developmental toxicants. We construct a CASRN-firm-year sample and repeat our analyses from Tables 2 to 8, replacing "*Ln*(1+*CEO #Superfund exposure*)" with "*Developmental toxic chemical* (0,1)" and adding CASRN fixed effects. In almost all regressions, except for leverage and share repurchases, the coefficients on *Developmental toxic chemical* (0,1) are significant and align with our baseline results. Conversely, when we include only Superfund sites with toxicants not classified as developmental toxicants, the results weaken considerably (results not shown for brevity). Overall, these findings confirm that prenatal exposure to developmental toxicants appears to be the primary factor driving our results.

5.3. Postnatal exposures to Superfund sites

5.3.1. Postnatal exposures to Superfund sites up to adolescence

A natural question is whether the results are primarily driven by CEOs' prenatal Superfund exposure or by a combination of prenatal and postnatal exposure if the CEOs lived in the same neighborhoods from birth to adolescence. The literature on the fetal origins hypothesis and the vulnerability of the developing brain to toxicants suggests that postnatal effects might be minor. To investigate the impact of CEOs' postnatal exposure to Superfund sites up to adolescence, we collect CEOs' high school and higher education records to identify non-moving CEOs who were born and grew up in the same county.[29] For the sample of non-moving Superfund CEOs, we first calculate the length of the pollutant accumulation periods for each Superfund site in the CEO's county *after* the CEO's birth year. We then measure the natural log of the likely length of CEO postnatal exposure to Superfund sites up to adolescence, *Ln*(*Length of CEO postnatal exposure*), defined as the minimum of either the maximum length of the pollutant accumulation periods for all nearby Superfund sites after the CEO's birth year or 15 years (age of entry into senior high school).

[29] CEOs' high school records are collected from birthplace data sources listed previously, LinkedIn, yearbooks, high school alumni association websites, and official high school websites, following the approach of Duchin, Simutin, and Sosyura (2021). To avoid misidentification with individuals of the same name, we cross-check using CEOs' work experiences, ages, or birthplaces. Among the 3,001 American-born CEOs with complete county-level birthplace records, we obtain high school county FIPS codes for 1,397 CEOs and identify 733 CEOs who were born and attended high school in the same county. We then collect higher education records from BoardEx, supplementing this data with additional sources as above, if needed. For those missing high school records, we assume that they were born and grew up in the same county if they attended a university in the same state. This assumption allows us to identify university state FIPS codes for 1,511 CEOs, of whom 679 were born and attended university in the same state. In total, the data show that 1,412 (47%) CEOs were likely born and raised in the same region. In addition, of our 501 non-American-born CEOs, 167 moved to the U.S. for their high school and higher education.

Using only the non-moving Superfund CEOs sample, we repeat all regression models from Tables 2 to 7 and IA4 to IA5 with "*Ln*(*Length of CEO postnatal exposure*)." The results, shown in Table IA11, are statistically weaker. In an unreported test, we focus on CEOs *without* prenatal Superfund exposure who moved to and grew up in a county with Superfund sites. These unreported results also show that postnatal exposure has weaker effects. Our findings align with those of Persico, Figlio, and Roth (2020), who document that *postnatal* exposure to Superfund sites has little impact on children's academic performance and cognitive abilities.

5.3.2. CEOs' current exposure to pollutants at work

Firm risk-taking activities could also result from the firm being a current polluter. Risk-taking firms might, for example, take shortcuts in controlling the pollution they emit. Another possibility is that Superfund CEOs' desensitization towards pollution might negatively influence their ESG policies, making them more likely to pollute and increase potential environmental liabilities, potentially leading to worse firm performance. Therefore, we next control for the current polluting activities. As mentioned in Section 2.1, the EPA identifies potentially responsible parties (PRPs) who may be liable as generators of contaminants at a Superfund site.[30] We collect the identities of PRPs from the Noticed Parties at Sites in SEMS (FOIA 11) from the EPA's Superfund Data and Reports. Additionally, we gather the complete list of firms with significant toxic chemical emissions that are required to self-report their emissions to the Toxics Release Inventory (TRI) program on Form R.[31] Using the identities of PRPs and the parent companies of TRI facilities, we determine if a firm is a current polluter. We denote these firms with the indicator variable, *Firm current polluter?* (0,1).

Alternatively, current exposure to pollution at the workplace could lower the performance of both the CEO and the workers. Studies have shown that even short-term exposure to hazardous waste sites can reduce performance in highly skilled, cognitively demanding jobs.[32] To address

[30] Typically, the EPA uses "general notice letters" and "special notice letters" to communicate with PRPs regarding their identification as PRPs and potential cleanup liabilities. For more details about the EPA's use of notice letters, please refer to the EPA's website at: https://www.epa.gov/enforcement/superfund-notice-liability-letters.

[31] After the passage of the Emergency Planning and Community Right-to-Know Act (EPCRA) in 1986, industrial facilities employing 10 or more full-time equivalent employees are required to self-report their emissions of specific hazardous pollutants to the TRI program using various forms. Among them, firms with significant emissions use the detailed reporting form (Form R).

[32] Even short-term exposure to hazardous waste sites and ambient air pollution reduces performance in highly skilled, cognitively demanding jobs (see Archsmith, Heyes, and Saberian, 2018; Heyes, Rivers, and Schaufele, 2019; Zhang,

concerns that our results are mainly driven by Superfund CEOs' workplace exposure to pollutants, we identify Superfund sites within a three-mile radius of firms' headquarters (HQ) and facilities (Greenstone and Gallagher, 2008; Persico, Figlio, and Roth, 2020). Since Compustat only reports the firm's current principal executive office address and not its historical HQ locations, we utilize Bill McDonald's historical headquarters data[33] and the header sections of 10-K/Q filings on SEC EDGAR to collect the longitude and latitude coordinates of firms' historical HQs. We also gather key facility-level information, including facility name, address, geospatial information, and parent company details from the EPA.[34, 35] We then construct indicator variables, *HQ current pollution exposure* (0,1) and *Facility current pollution exposure* (0,1), to identify Superfund sites within a three-mile radius of a firm's HQ and its facilities, respectively. Our results in Table IA12 show that *Ln*(1+*CEO #Superfund exposure*) remains statistically significant after controlling for CEOs' current workplace pollution exposure and their firms' polluting behavior.

One issue with Table IA12 is that, as shown in Table IA1, Superfund site pollution is mostly ground- or water-based. The literature also highlights the causal link between exposure to ambient air pollution and increased aggression, impulsivity, and reduced cognition or mental acuity (e.g., Archsmith, Heyes, and Saberian, 2018; Herrnstadt et al., 2021). Bishop et al. (2023) show that later-in-life cumulative exposure to air pollution could increase the probability of Alzheimer's disease or related dementias. To address concerns that exposure to air pollution could drive our results, we replace *HQ current pollution exposure* (0,1) and *Facility current pollution exposure* (0,1) with *Ln*(1+# *Days HQ current AQI* > 100) and *Ln*(1+# *Days Facility current AQI* > 100), respectively. We obtain the annual county-level air quality index (AQI) from the EPA website.[36] The higher the AQI value, the greater the level of air pollution, with values above 100 indicating

Chen, and Zhang, 2018; Chang, Graff Zivin, Gross, and Neidell, 2019; Ebenstein, Lavy, and Roth, 2016; Huang, Xu, and Yu, 2020).

[33] Available at https://sraf.nd.edu/data/augmented-10-x-header-data/.

[34] We obtain the file NATIONAL_FACILITY_FILE.CSV of key facility-level information and NATIONAL_ORGANIZATION_FILE.CSV of facilities' parent company information from https://www.epa.gov/frs/epa-state-combined-csv-download-files.

[35] Following Autor, Dorn, Hanson, Pisano, and Shu (2020), we use a search-engine-based algorithm (i.e., Bing Web Search API under Microsoft Azure) to match parent company names appearing on EPA to Compustat firms based on at least three shared web search URLs for those observations where the parent name strings on EPA and Compustat firm records do not match exactly.

[36] The county-level air quality index (AQI) data are available at https://www.epa.gov/outdoor-air-quality-data/about-air-data-reports.

unhealthy air quality. Results (untabulated) show that adding these variables to the baseline regressions in Tables 2-7 does not alter the significance of Ln(1+CEO #Superfund exposure).

5.4. Other robustness tests

In this section, we report other robustness tests. Since the results are broadly similar to our main results in Tables 2 to 7, they are not tabulated. First, to rule out the possibility that the firm policies under the Superfund CEOs are merely a continuation of the departing CEOs, we exclude the first year after the new CEOs assume their position. This adjustment results in little change in the sign or significance of our findings.

Second, one might argue that our results are driven by imbalanced data. Thirteen percent (400) of our CEOs and 14% of our CEO-firm-year observations come from three counties: New York County, Kings County in New York, and Cook County in Illinois. Eliminating these CEOs does not qualitatively change our results. Additionally, some counties, such as San Bernardino County in California, are much larger than others. In such large counties, measured by total area or income disparity, there could be significant disparities within the county, making county-level fixed effects potentially inadequate. Our results remain consistent after excluding the top three counties by total area or income disparities.

Third, we replace *Ln*(1+*CEO #Superfund exposure*) with the natural log of one plus the average Hazard Ranking System (HRS) scores, assigning a score of zero for firm-CEO observations without prenatal Superfund exposure. The HRS score offers a continuous measure of Superfund exposure risks. However, while the HRS score is critical in NPL listing decisions, it has faced significant criticism due to subjective judgments about the relative risks from migration, direct contact, and fire/explosion pathways, leading to revisions following the Superfund Amendments and Reauthorization Act of 1986 (Jennings, Mehta, and Mohan, 1994). [37] Additionally, a higher HRS score at one site does not necessarily have a more negative impact on the CEO than two sites with lower scores. Thus, we use the HRS scores only as a robustness test, and our results remain qualitatively similar.

Fourth, our results might be influenced by a cultural factor. Homegrown CEOs (born, raised, and managing firms in the same area) may have different cultural influences than other CEOs. For instance, due to personal attachments to their hometowns, homegrown CEOs may choose to work

[37] The revised HRS retains the water migration and air migration pathways, drops the direct contact and fire/explosion pathways, and adds a fourth pathway, soil exposure.

in their hometowns, disregarding potential Superfund pollution effects. This attachment could also influence their managerial styles (e.g., Lei, Petmezas, Rau, and Yang, 2023). We define a homegrown CEO as one whose birth county is also the county of the firm's headquarters. Eliminating these homegrown CEOs does not qualitatively change our results. Alternatively, we classify CEOs as local if they were born, attended high school in the same county (or college in the same state), and then served as CEOs in firms headquartered in the same county. Again, eliminating these local CEOs does not change our baseline regression results. Furthermore, adding the homegrown CEO dummy to our main regressions in Tables 2 to 7 does not alter the significance of the main Superfund exposure variable.

5.5. Matching sample analysis

Although we have addressed omitted variables correlated with prenatal Superfund exposure by including various controls and fixed effects, our analysis may still be susceptible to potential omitted variable biases. To validate our results, we construct two matching samples. The first matching sample pairs observations with Superfund CEOs to those with non-Superfund CEOs. Matched pairs satisfy the following criteria: (1) the matched CEOs were born in the same year (if feasible) or in the same decade, and (2) they are in the same FF48 industry. For those meeting these criteria, we select the control non-Superfund CEO from the nearest neighboring county to the Superfund CEO. This process creates CEO-firm-year pairs within the same industry, closely matched by CEOs' birthplaces and birth years. Table IA13 uses this nearest CEO birthplace matching sample and shows that most of our findings remain unchanged. Thus, our results are not driven by potential omitted variables at the CEO birth county-year level.

Our second nearest firm headquarters matching sample is composed of matched CEO-firm-year pairs that meet the following criteria: (1) the matched firms' CEOs were born in the same year (if feasible), or in the same decade, and (2) they are in the same FF48 industry. For those meeting these criteria, we select the control firm managed by a non-Superfund CEO with headquarters in the nearest neighboring county to the treated firm managed by a Superfund CEO. This process creates CEO-firm-year pairs within the same industry, closely matched by CEOs' birth years and their firms' headquarters locations. Table IA14 uses this nearest firm HQ matching sample and shows that our baseline findings remain largely unchanged in this matching sample. Thus, our conclusions do not appear to be affected by potential omitted variables at the firm headquarters-year level.

5.6. Placebo tests with falsely assigned birthplaces

In our final robustness test, we perform falsification tests by replacing the sample CEOs' birth counties (and county-level control variables) with pseudo-birth counties, creating two empirical bootstrap resampling distributions. In Table IA15, column (1), the pseudo-birth county is randomly chosen from all U.S. counties (not limited to the counties containing CEOs' actual birthplaces). This is done for each firm-CEO in the sample, forming a single pseudo sample on which we run each regression from the main tables. This process is repeated 1,000 times, creating an empirical pseudo-random CEO birthplace bootstrap resampling distribution. In Table IA14, column (2), for each firm-CEO in the sample, the pseudo-county is randomly chosen from the ten nearest counties to the CEO's actual birth county. After the replacement, we again run each regression from the main tables. This process is repeated 100 times, forming an empirical pseudo-nearest CEO birthplace bootstrap resampling distribution. In both columns, we use *Ln*(1+ *Pseudo-random CEO #Superfund exposure*) to capture the effect of the CEO's randomly assigned prenatal Superfund exposure for the bootstrap resampling distributions. Each column includes the same control variables and fixed effects as the corresponding previous tables. We report the fraction of the total number of bootstrap regressions that show significant (p-value $\leq$0.05) coefficients on *Ln*(1+ *Pseudo-random CEO #Superfund exposure*) as our main tables.

Table IA15 shows that our CEO pseudo prenatal Superfund exposure variable is insignificant in most specifications. In column (1), out of 24 specifications, significant results from random assignment occur more than 5% of the time in only nine cases. In column (2), significant results occur more than 5% of the time by chance in only four cases. There are only three cases (credit rating, CEO forced turnover, and CEO tenure) where the results from both randomization techniques coincide. This indicates that our original findings are not driven by random chance.

6. Conclusions

This paper investigates how CEOs' inadvertent prenatal exposure to Superfund sites affects three aspects of corporate outcomes: external corporate policies, firm performance, and CEO career trajectories. Superfund sites represent the most hazardous contaminated areas in the U.S. Our sample primarily consists of CEOs born before industrial chemicals were widely recognized as developmental toxicants. Given the limited public awareness of neurotoxicity during this period, it is improbable that the CEOs' parents were cognizant of or attempted to avoid the risks associated with proximity to future Superfund sites. This inadvertent exposure mitigates self-selection

concerns that often confound studies on CEO risk-taking behavior. By leveraging the historical development of environmental awareness, our research design isolates the biological effects of pollution exposure from other potential selection effects. This approach provides a novel framework for investigating the long-term economic impacts of environmental factors, offering implications for future research in accounting, finance, and economics.

Our findings expand on the fetal origins hypothesis and prior medical research, which show that prenatal environmental factors can have lasting impacts on adult decision-making, including risk preferences. We find that CEOs with prenatal exposure to Superfund site contaminants display a pattern of more aggressive managerial choices. These choices generally lead to adverse firm outcomes, such as weaker performance metrics and shorter CEO tenures. Importantly, our analysis suggests that risk-taking behavior, rather than cognitive impairments caused by early exposure, is the primary driver of these results. This conclusion is supported by the stark contrast between underperforming external policies driven by high-risk strategies and the efficiency gains seen in internal policies under the same CEOs. The divergence in outcomes underscores that the behaviors are deliberate rather than stemming from broad cognitive deficits, advancing our understanding of the economic consequences of early-life environmental exposure.

CEOs with prenatal exposure to Superfund sites are more likely to be promoted internally rather than hired externally, reflecting their perceived strong internal performance and firm-specific expertise. However, the success of their internal policies may partially rely on luck, as risk-taking strategies inherently involve uncertainty. Once these executives reach top leadership roles, their propensity for risk-taking often shifts toward external policies, where outcomes are less predictable and frequently detrimental to overall firm performance. By examining both prenatal pollutant exposure and hiring patterns, our findings highlight the role of early-life environmental factors and career trajectories in shaping corporate outcomes, while also underscoring the influence of chance in the path to executive leadership.

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Appendix A

Variable Name	Definition
Pollution exposure variables	
Superfund CEO	An indicator variable that takes the value of one if the CEO's birth county generated the U.S. worst hazardous contaminants during her birth year and zero otherwise. These sites are later designated as Superfund sites.
CEO #Superfund exposure	The number of sites later designated as Superfund sites in the CEO's birth county during her birth year.
Developmental toxic chemical (0,1)	An indicator variable that equals one if the contaminant is a developmental toxic substance and zero otherwise. Significant prenatal outcomes related to developmental toxicant exposure include poor infant birth outcomes. Among infants who survive to adulthood, outcomes related to developmental toxicant exposure include growth retardation, functional impairment, or damage to neurodevelopment, psychophysical, and cognitive development. Our toxicity classification is based on the human health risk assessment by the U.S. EPA's IRIS database and the developmental toxicity studies in laboratory animals.
Ln(Length of CEO postnatal exposure)	The natural log of the length of likely CEO postnatal exposure to Superfund sites up to adolescence is calculated as the minimum (maximum length of the pollutants accumulation periods for all nearby Superfund sites after the CEO's birth year, 15 (age of entry into senior high school)).
Firm current polluter? (0,1)	An indicator variable that equals one for the firm-year observations when firms are required to self-report their emissions to the Toxics Release Inventory (TRI) program on Form R, or the firm is one of the potentially responsible parties (PRPs) for the Superfund sites.
HQ current pollution exposure (0,1)	An indicator variable that equals one when there are Superfund sites within a three-mile radius circle around the firm's headquarters (HQ) and zero otherwise.
Facility current pollution exposure (0,1)	An indicator variable that equals one when there are Superfund sites within a three-mile radius circle around the firm's facilities and zero otherwise.
Post CEO demise (0,1)	An indicator variable that equals one in the three years after a CEO's sudden death, and zero in the three years before the demise of a CEO. CEOs' sudden deaths refer to heart attack, stroke, plane crash, car, boating, or mountain accident, cancer within a year of diagnosis, and other similar unexpected death events.
Deceased CEO #Superfund exposure	The number of sites later designated as Superfund sites in the deceased CEO's birth county during her birth year.
Pseudo-random CEO birthplace bootstrap resampling	To construct an empirical pseudo-random CEO birthplace bootstrap resampling distribution, we replace the sample CEOs' birth county (and county-level control variables) with a pseudo-CEO birth county randomly chosen from all U.S. counties (not limited to the CEOs' birthplaces in our sample). This is done for each firm-CEO in the sample forming a single pseudo sample. This process is repeated 1,000 times, creating an empirical pseudo-random CEO birthplace bootstrap resampling distribution.
Pseudo-nearest CEO birthplace bootstrap resampling	To construct an empirical pseudo-nearest CEO birthplace bootstrap resampling distribution, we replace the sample CEOs' birth county (and county-level control variables) with a pseudo-CEO birth county randomly chosen from the ten nearest counties. This is done for each firm-CEO in the sample, forming a single pseudo sample. This process is repeated 100 times creating an empirical pseudo-nearest CEO birthplace bootstrap resampling distribution.
Air Quality Index	Used in unreported robustness checks only. The annual county-level exposure to air pollution variables is obtained from the EPA Air Quality Index database.
Corporate cash, leverage, and payout policy variables	
Cash/Assets	The ratio of cash and short-term investments to the book value of total assets.
Leverage	The ratio of the book value of total long-term debt over total assets.

Ln(1+Share repurchase)	The natural logarithm of one plus dollar amounts of share repurchase.
Corporate debt aggressiveness variable	
Kink	The amount of hypothetical interest where the expected marginal tax-shield benefit function becomes downward sloping, expressed as a proportion of actual interest expense (Graham, 2000; Malmendier, Tate, and Yan, 2011).
Corporate credit risk and default risk variables	
Credit rating	Credit ratings provided by Standard & Poor's (S&P), Moody's, Fitch, and Duff and Phelps, which are given a numerical score increasing by 1 for each increase in credit rating, with a 0 corresponding to a rating of D and 24 corresponding to a rating of AAA. Since the S&P Rating database was discontinued after February 2017, we fill the missing data and data after February 2017 using the Mergent Fixed Income Securities Database (FISD).
Junk rating (0,1)	An indicator variable that equals one if the Standard & Poor's domestic long-term issuer credit ratings or converted credit ratings from other agencies are lower than BBB− in a given year and zero otherwise.
Bankruptcy score	Zmijewski's (1984) bankruptcy score, which is -4.3−(4.5×ROA)+(5.7×Leverage)−(0.004×Current Ratio); higher scores indicate higher levels of financial distress.
Default probability	The estimated probability of default is based on KMV-Merton's (1974) model (Bharath and Shumway, 2008).
Corporate cost of borrowing variables	
Interest expense/Debt	Interest expense divided by total debt.
Bank loan all-in-spread	All-in-spread over LIBOR includes all fees, in basis points, for bank loans at the time of loan initiation. Bank loan data are from DealScan.
Bond issue spread	Spread over the U.S. Treasury yields of equivalent maturity, in basis points, for the firm's newly issued bonds' yield-to-maturity. Bond issue data are from the Mergent Fixed Income Securities Database (FISD).
Corporate equity risk variables	
$\sigma_{\text{Stock return}}$	The annualized standard deviation of a firm's stock return.
$\sigma_{\text{Specific return}}$	The annualized square root of the residual variance from an expanded index model regressing a firm's weekly returns on the contemporaneous, two leads, and two lags of CRSP weekly value-weighted market index returns and the relevant Fama-French (1997) weekly value-weighted industry index returns. We allow nonsynchronous trading by including two leads and two lags for the market and industry indexes (Hutton, Marcus, and Tehranian, 2009).
Negative skewness	Negative one multiplied by the skewness (the third standardized moment) of firm-specific weekly returns (defined in $\sigma_{\text{Specific return}}$) for each firm-year (Xu, Xuan, and Zheng, 2021).
$\sigma_{\text{Down-to-up}}$	Natural logarithm of the ratio of the standard deviation of firm-specific weekly returns in down weeks to the standard deviation of firm-specific weekly returns in up weeks (Xu, Xuan, and Zheng, 2021). Down (up) weeks are weeks with firm-specific weekly returns below (above) the annual mean.
Crash risk	The frequency that a firm-year experiencing crash weeks during the fiscal year. Crash weeks are the frequencies with which the firm-specific weekly returns fall 3.09 standard deviations (probability 0.001 events for a normal distribution) below the annual mean (Kim, Li, and Zhang, 2011).
Corporate M&A announcement abnormal returns and the propensity of unrelated acquisitions variables	
CAR(-1,1) Market model	The acquirer's cumulative abnormal return (CAR) during trading days [–1, +1] around the M&A announcement (day 0) is based on the market model regressions of daily stock returns on the CRSP value-weighted market index. The estimation period for the market model is from day −131 through day −31 before the M&A announcement (day 0). We obtain merger and acquisition (M&A) announcements that involve U.S. public

	acquiring firms in the Securities Data Corporation's (SDC) U.S. Mergers and Acquisitions database.
CAR(-1,1) FF4 model	The acquirer's cumulative abnormal return (CAR) during trading days [–1, +1] around the M&A announcement (day 0) is based on the Carhart (1997) four-factor model regressions of daily stock returns on the CRSP value-weighted market index, size, book-to-market, and momentum factor. The estimation period for the Carhart (1997) four-factor model is from day −131 through day −31 before the M&A announcement (day 0).
Unrelated acquisition (0,1)	An indicator variable that equals one if the target is not in the same Fama–French (1997) 48 industry as the acquirer and zero otherwise. We obtain merger and acquisition (M&A) announcements that involve U.S. public acquiring firms in the Securities Data Corporation's (SDC) U.S. Mergers and Acquisitions database.
Firm internal efficiency variables	
Cash conversion cycle (CCC Sales)	365×(Avg. Inventories/COGS)+365×(Avg. Total Receivables/Sales)−365×(Avg. Accounts Payable/COGS). As CCC contains zero and negative values and to handle potential extreme values, we apply an inverse hyperbolic sine transformation (IHS) to CCC Sales, i.e., IHS (CCC Sales) = ln(CCC+$\sqrt{CCC^2+1}$).
Cash conversion cycle (CCC Revenue)	365×(Avg. Inventories/COGS)+365×(Avg. Total Receivables/Total Revenue) −365×(Avg. Accounts Payable/COGS). We apply an inverse hyperbolic sine transformation to CCC Revenue.
Asset turnover	Net sales/Average total assets.
Capex efficiency (Revenue)	Total revenue (REVT)/Capital Expenditures (CAPX). As REVT/CAPX contains zero and negative values and to handle potential extreme values, we apply an inverse hyperbolic sine transformation to REVT/CAPX.
Employee productivity	Total revenue (REVT)/Employees (EMP). As REVT/EMP contains zero and negative values and to handle potential extreme values, we apply an inverse hyperbolic sine transformation to REVT/EMP.
Layoff severity	The number of employees laid off is divided by the total employees pre-layoff, computed as -(EMP_t - EMP_{t-1}/EMP_{t-1}). As layoff severity contains zero and negative values and to handle potential extreme values, we apply an inverse hyperbolic sine transformation to -(EMP_t - EMP_{t-1}/EMP_{t-1}).
Firm performance variables	
ROA	The ratio of operating income before depreciation scaled by total assets.
Tobin's Q	The ratio of market-to-book value of assets.
Stock return	Annual buy-and-hold stock return, including dividends.
Ind. adj. ROA	The focal firm's ROA adjusted by the median ROA of firms from the same industry (based on Fama-French (1997) 48-industry classification) as the focal company in a given year.
Ind. adj. Tobin's Q	The focal firm's Tobin's Q adjusted by the median Tobin's Q of firms from the same industry (based on Fama-French (1997) 48-industry classification) as the focal company in a given year.
Ind. adj. Stock return	The focal firm's stock returns adjusted by the median stock returns of firms from the same industry (based on Fama-French (1997) 48-industry classification) as the focal company in a given year.
Firm prestige variable	
MAC (0,1)	An indicator variable equals one indicating a top 50 rank in Fortune's "America's Most Admired Companies" (MAC) ranking and zero otherwise.
MAC score	The score (total score is ten) of the top 50 rank in Fortune's "America's Most Admired Companies" ranking. It is computed based on the average of the attribute scores and zero for the rest of the sample firms.

CEO turnover and outside CEO appointment variables	
Ln (1+CEO tenure)	The natural logarithm of one plus the number of years the current CEO has held her position.
Forced CEO turnover (0,1)	An indicator variable for CEO involuntary departure events in which a news article indicates a forced departure. The forced CEO turnover indicator equals one in year *t* if the incumbent CEO is in office for the larger part of fiscal year *t* but is no longer in office for fiscal year *t*+1.
Generic CEO turnover (0,1)	An indicator variable for all CEO turnover events excluding turnover in which the CEO leaves the firm to immediately accept a position elsewhere or where the CEO leaves the firm for health reasons. The generic CEO turnover indicator equals one in year *t* if the incumbent CEO is in office for the larger part of fiscal year *t* but is no longer in office in fiscal year *t*+1.
Severance payment if CEO turnover (0,1)	An indicator variable for all CEO turnover events in which the CEO received severance payments upon departure. We collect severance payment information from explicit CEO severance pay contracts or explicit CEO employment contract terms, including golden handshakes or golden parachutes.
Outside CEO (0,1)	An indicator variable that equals one if the individual joined the firm and became CEO in no more than two years and zero otherwise (Gopalan, Milbourn, and Song, 2010).
Family firm (0,1**)**	An indicator variable that equals one for firm-years where members of the founding family hold positions in top management, are on the board, or are blockholders of the company.
CEO incentive compensation variables	
Ln(1+CEO Delta)	The natural logarithm of one plus the change in the risk-neutral (Black-Scholes) value of a CEO's total portfolio of all current and prior grants of shares and options for a 1% change in the price of the underlying stock.
Ln(1+CEO Vega)	The natural logarithm of one plus the change in the Black-Scholes value of a CEO's total portfolio of outstanding options for a 1% change in the standard deviation of the return.
Proportion of options	The value of option grants as a percentage of total compensation.
County-level control variables	
County poverty status	The percentage of the county population with income that falls below the appropriate official poverty threshold. The data source is the IPUMS USA database variable POVERTY, which was created using detailed income and family structure information about each individual and calculating the family income as a percentage of the appropriate official poverty threshold.
County employment status	The percentage of the county population that is employed. The data source is the IPUMS USA database variable EMPSTAT.
County earnings per capita	The average personal total pre-tax wage and salary income for each county. The data source is the IPUMS USA database variable INCWAGE.
CEO characteristics control variables	
Ln(CEO age)	The natural logarithm of the age of the CEO.
CEO age≥ 60 (0,1)	An indicator variable that equals one if the CEO's age (measured in years) is at least 60.
CEO duality (0,1)	An indicator variable that equals one if the CEO also holds the title of chairman of the board of directors and zero otherwise. CEO duality data are obtained from RiskMetrics and SEC filings.
Founder CEO (0,1)	An indicator variable that equals one if the current CEO founded the firm and zero otherwise. The CEO's founder status is obtained from Equilar Consultants and SEC filings.
Outside CEO (0,1)	An indicator variable that equals one if the individual joined the firm and became CEO in no more than two years and zero otherwise (Gopalan, Milbourn, and Song, 2010).
CEO ownership	The percentage of the firm's total common stock owned by the CEO.
CEO Salarycomp	The ratio of CEO salary to total compensation.

Firm and industry characteristics control variables	
Assets volatility	The standard deviation of stock return times the market value of equity divided by the market value of assets.
Ln(Assets)	The natural logarithm of the firm's book value of total assets.
Capex	The ratio of capital expenditures to the book value of total assets.
R&D	The ratio of research and development expense to the book value of total assets. We code the missing values of research and development expense as zero.
Dividend (0,1)	An indicator variable that equals one if the firms pay cash dividends and zero otherwise.
Cash flow/Assets	The ratio of cash flow from operations (operating income before depreciation minus interest minus taxes minus cash dividends) to the book value of total assets.
NWC/Assets	The ratio of net working capital (current assets minus cash minus current liabilities plus debt in current liabilities) to the book value of total assets.
Acquisition/Assets	The ratio of cash outflows associated with acquisitions (Compustat data item AQC) to the book value of total assets.
PP&E/Assets	The ratio of net property, plant, and equipment to the book value of total assets.
Growth in sales	Sales less lagged sales over the lagged sales.
Inst. ownership	Total institutional ownership based on the data from the Thomson-Reuters Institutional Holdings (13F) database.
Outside directors	The number of independent directors divided by the total number of directors on the firm′ s board.
NOL carryforward (0,1)	An indicator variable that equals one if the firms have a net operating loss (NOL) carryforward (Compustat data item TLCF>0) and zero otherwise.
ECOST	The expected cost of financial distress (ECOST), which is the product of a term related to the likelihood of economic distress (the standard deviation of the first difference in the firm's historical EBIT, divided by the mean level of book assets) and a term related to intangibles (, and the sum of research and development expense and advertising expense divided by sales).
CYCLICAL	The standard deviation of operating earnings divided by mean assets, calculated for each firm, and then averaged in a given Fama-French (1997) 48 industry and year; the means and the standard deviation are estimated on a rolling basis.
Z-score	Modified Altman's (1968) Z-score; (3.3×EBIT +1×Sales +1.4×Retained Earnings + 1.2×Working Capital)/Total Assets.
Ln(Sales)	The natural logarithm of sales.
Current ratio	The ratio of current assets to current liabilities.
R&D/Sales	The ratio of research and development expense to sales. We code the missing values of research and development expense as zero.
AD/Sales	The ratio of advertising expense to sales. We code the missing values of advertising expense as zero.
Computer industry (0,1)	An indicator variable that equals one if the firms are in the computer industry (three-digit SIC code 357) and zero otherwise.
Semiconductor industry (0,1)	An indicator variable that equals one if the firms are in the semiconductor industry (three-digit SIC code 367) and zero otherwise.
Chemicals industry (0,1)	An indicator variable that equals one if the firms are in chemicals and allied products industries, including drugs (three-digit SIC codes 280 to 289) and zero otherwise.
Aircraft industry (0,1)	An indicator variable that equals one if the firms are in aircraft, guided missiles, and space vehicles industry (three-digit SIC codes 372 and 376) and zero otherwise.
Other sensitive industry (0,1)	An indicator variable that equals one if the firms are in other sensitive industries (three-digit SIC codes 340 to 400, excluding 357, 367, 372, and 376) and zero otherwise.
Opacity	Following Hutton, Marcus, and Tehranian (2009), we employ a measure of opacity based on measures of accruals quality: the three-year moving sum of the absolute value of annual discretionary accruals proposed by Dechow and Dichev (2002).

Ln(B/M)	The natural logarithm of the ratio of the book-to-market value of equity.
TNIC total similarity	Total product similarity scores, which are the sum of firm pairwise similarity scores based on text-based network industry classifications (TNIC) (Hoberg and Phillips, 2016).
PP&E/Sales	The ratio of net property, plant, and equipment over sales.
Intangibles	The ratio of the sum of research and development expense and advertising expense over sales. We code the missing values of research and development expense as zero.
Dividend yield	The ratio of common stock dividends and preferred stock dividends (Compustat data items DVC+DVP) scaled by the market value of common stock and the par value of preferred stock (Compustat data items PRCC_F × CSHO+ PSTK).
Ln(Local peers)	The natural log of the number of Compustat firms from the same industry (based on Fama-French (1997) 48-industry classification) and within a 150-mile-radius circle around the focal company headquarters.
Non-compete index	The state-level index that measures how difficult it is to enforce a non-compete clause in an employment contract. Larger index numbers indicate that the strength of enforcement of a non-compete clause is stronger. The data source for the non-compete index is Garmaise (2011) Table A1.
Ind. return percentile	The industry median annual buy-and-hold stock returns measured on a percentile basis within the annual cohort of all Compustat firms from the same industry (based on Fama-French (1997) 48-industry classification) as the focal company.
Firm abnormal return percentile	The focal firm's industry-adjusted annual buy-and-hold stock returns measured on a percentile basis.
Ind. return risk	Industry stock return volatility computed from daily value-weighted returns on the same industry (based on Fama-French (1997) 48-industry classification) as the focal company. The daily return data on the 48-industry portfolio are obtained from the Kenneth R. French data library.
Firm abnormal return volatility	The focal firm's industry-adjusted stock return volatility over the fiscal year.
Ln(Mktcap)	The natural log of market value of equity.
Ln(Firm age)	The natural log of the number of years since the year of listing.
Family $firm_{non\text{-}exec}$ (0,1)	An indicator variable that equals one for firm-years where members of the founding family are on the board or are blockholders of the company.
Family $firm_{Exec}$ (0,1)	An indicator variable that equals one for firm-years where members of the founding family continue to be top management of the companies.
Bank loan and bond issuance contract characteristics variables	
Previous lending relationship (0,1)	An indicator variable that equals one if the same lead bank arranged other loans for the same borrower over the previous three years and zero otherwise (Ivashina, 2009). We use the variable LeadArrangerCredit from DealScan to identify if a lender is also a lead arranger.An indicator variable that equals one if over the previous three years the same lead bank arranged other loans for the same borrower and zero otherwise (Ivashina, 2009). We use the variable LeadArrangerCredit from DealScan to identify if a lender is also a lead arranger.
Ln(Facility amount)	Natural logarithm of the offering amount of the largest facility within the same loan package with the earliest active date. Bank loan data are from DealScan.
Maturity (in months)	Maturity, measured in months, of the largest facility within the same loan package with the earliest active date. Bank loan data are from DealScan.
Number of facilities	The number of facilities within the same bank loan package. Bank loan data are from DealScan.
Collateral (0,1)	An indicator variable that equals one if the bank loan is securitized and zero otherwise. Bank loan data are from DealScan.
Financial covenants (0,1)	An indicator variable that equals one if the bank loan has financial covenants and zero otherwise. Bank loan data are from DealScan.

Prime base rate (0,1)	An indicator variable that equals one if the base rate for the bank loan is prime and zero otherwise. Bank loan data are from DealScan.
Performance pricing (0,1)	An indicator variable that equals one if the bank loan has a performance pricing provision and zero otherwise. Bank loan data are from DealScan.
Ln(Amount)	Natural logarithm of the bond offering amount. Bond issue data are from Mergent FISD.
Covenants (0,1)	An indicator variable that equals one if the bond has covenant protection and zero otherwise. Bond issue data are from Mergent FISD.
Callable (0,1)	An indicator variable that equals one if the bond is callable and zero otherwise. Bond redemption data are from Mergent FISD.
Corporate M&A deal characteristics variables	
All stock (0,1)	An indicator variable that equals one if the M&A transaction is completely paid in stock, and zero otherwise.
% acquired	Fraction of the target firm exchanged in the M&A transaction.
Hostile (0,1)	An indicator variable that equals one if the target board officially rejects the offer yet the acquirer persists with the acquisition, and zero otherwise.
Competing bidders	The number of third-party launching offers for the same target while the original bid was pending, and zero otherwise.
Tender offer (0,1)	An indicator variable that equals one when a tender offer is launched for the target and zero otherwise.
Termination fees (0,1)	An indicator variable that equals one if the target or acquirer has made a termination fee agreement whereby failure to consummate the M&A transaction results in a payment made by one party to the other and zero otherwise.
Public status (target) (0,1)	An indicator variable that equals one if the target is listed on a stock exchange and zero otherwise.
Toehold (0,1)	An indicator variable that equals one if the acquirer owns more than 0.5% ownership in the target before the M&A announcement.
CAR(-131,-31) (acquirer)	Run-up (or run-down) measured by the acquirer's cumulative abnormal return (CAR) during trading days [–131, -31] beforeprior to the M&A announcement (day 0) based on the market model.

Appendix B

Summary of the previous literature on CEOs' early life experiences, their effects, and outcomes

This table summarizes the existing studies on CEOs' early life experiences, their effects, and outcomes. For every early life experience, we identify three types of effects: Selection effect (S): The effect of the early life experience could be driven by selection effect from themselves or their families; Biological treatment effect (B): A pure biological effect of the early life experience; Cohort effect (C): The effect of the early life experience affects all people born during the shock periods. *We only consider the economic magnitudes of the treatment on the dependent variables that (1) are explicitly stated in the paper and (2) also discussed in Rau, Wu, and Ieong (2024).

Study	Early life experience	Sample size	Effect(s)			Economic magnitudes*
			(B)	(S)	(C)	
Rau, Wu, and Ieong (2024)	#Superfund exposure	3,001 CEOs	×			Firms managed by CEOs with prenatal exposure to one Superfund site have a 1.32% lower cash-to-assets ratio, 3.13% increase in leverage, 0.58 level of share repurchases, 0.82 reduction in kink, 18.93% higher in bankruptcy scores, 7.13% higher default probability, 11.65 bps higher in all-in-bank loan spread, 64.43 bps higher in bond issue spread, 5.7% increase in annualized total stock return volatilities, 0.2424 higher levels of negative skewness, 0.0579 higher levels of down-to-up volatility, 0.1216 greater levels of crash risk, 43.67-56.14 bps lower acquirer's cumulative abnormal return during the trading days [–1, +1] around the M&A announcement (day 0), 122.69 bps lower ROA, 0.0688 lower Tobin's Q, 365.98 bps drop in annual buy-and-hold stock returns, 3.52% shorter tenures.
Malmendier, Tate, and Yan (2011)	The Great Depression	498 CEOs	×		×	Firms managed by CEOs who experienced the Great Depression have 0.5053 higher kinks
	Military experience		×	×		Firms managed by CEOs with military experience have 13% more leverage.
	World War II Veteran		×	×		Firms with World War II veteran CEOs have 25% higher leverage.
Schoar and Zuo (2017)	Recession when CEOs started their careers	4,152 CEOs	×		×	CEOs who experienced recessions at the beginning of their careers receive 11-16% lower total compensation, including options exercised. Their firms have 0.4% lower capital expenditures, 0.4% lower R&D expenditures, 1.2% lower SG&A expenses, 0.8% lower leverage, 1.8% lower working capital needs, 1.6% lower sales growth, 4% lower stock return volatility, and 0.2% lower ROA.
Benmelech and Frydman (2015)	Military experience	4,013 CEOs	×	×		Firms managed by CEOs with military experience are associated with reductions of 8.1% in corporate investment, 10.7% in R&D expenditure, 5.4% in book leverage, and 6.2% in market leverage related to their unconditional means.
Bernile, Bhagwat, and Rau (BBR, 2017)	Moderate disaster fatality experience	1,508 CEOs	×	×		Compared to firms with CEOs without disaster experience, firms with Medium Fatality CEOs have 1.2% less cash per dollar of assets, 3.3% higher leverage, 7.1% more likely to have below-investment-grade ratings, 1.6% higher annual interest expenses per dollar of outstanding long-term debt, 18.9 basis points higher bond issue spread, 6.1% more likely to attempt an acquisition, 7.4% less likely to make an all-stock acquisition, 7.9% more likely to announce unrelated acquisitions, and 3.73% higher annualized stock volatility; these firms also earn 0.57% lower abnormal returns during the five trading days around the merger announcements when being acquired.

	Extreme disaster fatality experience		×	×	Compared to firms with CEOs without disaster experience, firms with Extreme Fatality CEOs have 2.2% more cash per dollar of assets, 3.5% lower leverage, 8.8% less likely to have below-investment-grade ratings, 1.5% lower annual interest expenses per dollar of outstanding long-term debt, 20.6 basis points lower bond issue spread, 8.1% less likely to attempt an acquisition, and 3.61% lower annualized stock volatility; these firms also use 15 cents less debt financing to cover financing deficits and earn 1.25% higher abnormal returns during the five trading days around the merger announcements when being acquired.
Chen, Fan, Yang, and Zolotoy (2021)	Natural disasters	429 CEOs	×	×	Firms with CEOs who experienced natural disasters during their early life have a 0.069 increase in one-year ahead probability of stock price crash, 0.105 one-year-ahead negative skewness, and 0.0603 one-year-ahead down-to-up volatility.
Gao, Pi, Wu, and Yuan (2022)	Natural disasters	1,858 CEOs	×	×	Firms with a disaster CEO have 0.0669 higher stock return volatilities and 0.2193 greater operating cash flow volatilities.
Cronqvist and Yu (2017)	Birth of a daughter	416 CEOs	×	×	Having a daughter is associated with a 3.2% increase in SG&A expenses.
Al-Sabah (2023)	Community diversity (D&I scores)	1,963 CEOs	×	×	A standard deviation (Std. Dev.) increases in (instrumented) D&I scores is associated with drops of 0.38 Std. Dev. in book leverage and 0.39 Std. Dev. in capex-to-assets ratio but increases of 0.47 Std. Dev. in R&D-to-assets ratio and 0.45 Std. Dev. in SG&A-to-assets ratio.
Henderson and Hutton (2018)	Early childhood experience - Socioeconomic status	1,258 CEOs	×	×	Firms replacing a CEO from the lowest socioeconomic class with one from the highest show reductions of 15.4% in total volatility, 18.2% in idiosyncratic volatility, 46.2 R&D, 19.1% in capital expenditures, 6.9% in leverage, 29% in Tobin's Q, and 105% change in market-adjusted returns.
	Firstborn		×	×	Firms replacing a firstborn CEO with a later-born CEO reduce total volatility by 0.026 of the sample mean and CapEx by 0.063 of the sample mean.
Chen, Luo, Tang, and Tong (2023)	Pre-career exposure to religion	3,820 CEOs	×	×	Firms with CEOs who attended religious schools have 3% lower risk-taking behaviors (measured by the sum of R&D expenditure, CapEx, and the amount spent on M&As).

Figure 1. Geographic distribution of Superfund sites listed on the National Priorities List (NPL)

This Figure illustrates the number of Superfund sites in each county in the United States. These Superfund sites include all the sites as of December 31, 2018, that were, have been, or are being listed on the National Priorities List (NPL). This Figure does not show Superfund sites in the five U.S. territories (Puerto Rico, American Samoa, Commonwealth of Northern Marianas, Virgin Islands, and Guam) and the Federated States of Micronesia.

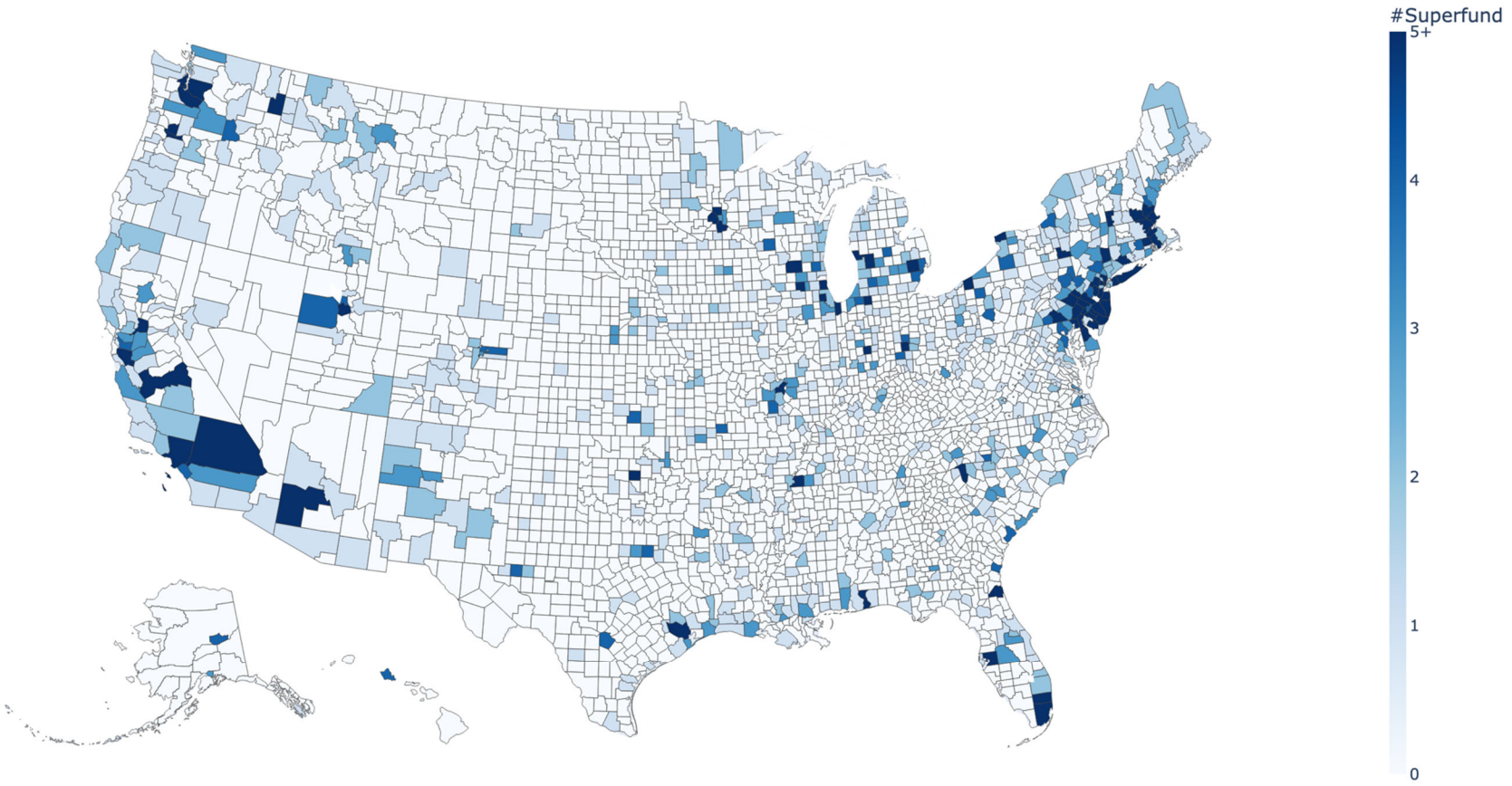


Figure 2. The distribution of CEO birth years and their Superfund exposures
This figure shows the distribution of CEO birth years and their Superfund exposures. The blue dots represent a birth year-Superfund exposure pair. The larger the dot reflects the greater number of CEOs were born in that year with that specific Superfund exposure. We mark three critical years: The green line in 1962 is the beginning of the U.S. environmental movements (i.e., the publication of "Silent Spring"); the brown line in 1970 is the year when the U.S. Environmental Protection Agency (EPA) was formed; the red line in 1979 is the year when President Carter proposed the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, aka Superfund Act).

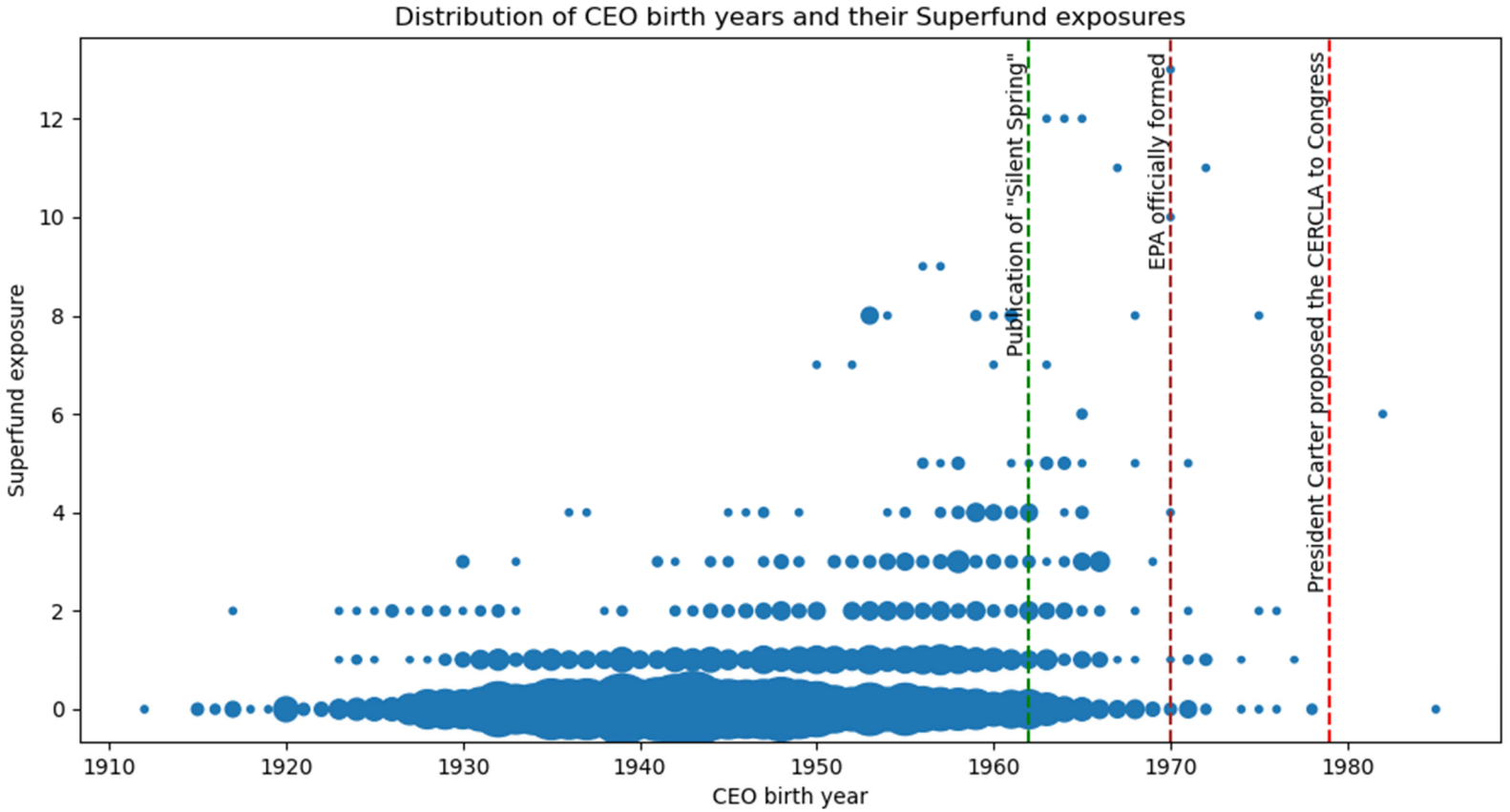


Table 1. Comparison between firms run by Superfund CEOs and non-Superfund CEOs

This table reports summary statistics for comparisons between firms managed by the Superfund CEOs and other CEOs. The Superfund CEOs subsample includes all firm-year observations for firms having a Superfund CEO that year. The rest of the firm-year observations with valid CEO birth years and birthplaces in the U.S. are in the non-Superfund CEOs subsample. Tests of differences in means (medians) are two-sample t-tests (Kruskal-Wallis H-tests). ***, **, and * denote significant differences at the 1%, 5%, and 10% levels, respectively.

	Superfund CEOs (Observations=4,852)				Non-Superfund CEOs (Observations=14,721)				t-test Superfund vs. Non-Super.	(Kruskal-Wallis H test) Superfund vs. Non-Super.
	N	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.		
# of Unique CEOs	734				2,267					
Size										
Ln(Assets)	4,831	8.3960	8.3938	1.9528	14,657	8.0388	7.9522	1.8970	11.10***	(129.23***)
Ln(Sales)	4,823	7.9233	7.9994	1.7877	14,630	7.6261	7.6123	1.6917	10.14***	(110.19***)
Performance										
ROA	4,843	0.0371	0.0372	0.0659	14,674	0.0429	0.0408	0.0622	-5.38***	(26.33***)
Tobin's Q	4,558	1.7480	1.4101	0.9089	13,820	1.7622	1.3953	0.9479	-0.90	(0.14)
Stock return	4,378	0.2247	0.1258	0.8328	13,082	0.2304	0.1258	0.7356	-0.40	(0.11)
Growth opportunities										
PP&E/Assets	4,751	0.2606	0.1840	0.2399	14,421	0.2989	0.2401	0.2465	-9.47***	(101.07***)
Capex	4,649	0.0506	0.0350	0.0556	13,894	0.0570	0.0429	0.0598	-6.73***	(98.57***)
R&D	4,831	0.0275	0.0000	0.0630	14,657	0.0227	0.0000	0.0950	3.99***	(20.44***)
Debt risk										
Leverage	4,827	0.2144	0.1762	0.1999	14,626	0.2111	0.1823	0.2020	0.95	(0.13)
Cash/Assets	4,843	0.1346	0.0726	0.1587	14,675	0.1176	0.0560	0.1503	6.55***	(75.38***)
Credit rating	3,351	16.0185	16.000	3.5836	9,676	16.2485	16.000	3.4765	-3.23***	(6.49**)
Default probability	3,813	0.1127	0.0000	0.2434	11,395	0.1039	0.0000	0.2340	1.95*	(4.37**)
Interest expense/Debt	4,340	0.1927	0.0616	3.2866	13,235	0.1994	0.0684	5.0006	-0.10	(164.34***)
Equity risk										
Dividend (0,1)	4,830	0.6433	1.0000	0.4791	14,652	0.6955	1.0000	0.4602	-6.64***	(29.77***)
Ln(1+Share repurchase)	4,495	2.9589	2.6391	2.8479	13,295	2.4611	1.6095	2.6598	10.30***	(95.86***)
$\sigma_{\text{Stock return}}$	4,201	0.4018	0.3485	0.2121	12,648	0.3863	0.3497	0.1470	4.39***	(3.03*)
$\sigma_{\text{Specific return}}$	3,942	0.3114	0.2557	0.2087	11,735	0.3023	0.2677	0.1312	2.57***	(23.46***)
Other risk										
Acquisition (0,1)	4,852	0.3510	0.0000	0.4773	14,721	0.3347	0.0000	0.4719	2.07**	(2.91*)
County-level variables										
County poverty status	4,843	14.4837	12.3976	8.3924	14,691	21.8896	17.1784	13.6853	-44.83***	(1561.80***)
County employment status	4,459	40.1133	40.0141	5.3299	13,900	39.0507	38.6680	12.1561	8.15***	(308.86***)
Ln(County earnings per capita)	4,843	7.7478	7.8011	0.6985	14,619	7.3048	7.5938	1.0061	33.97***	(1059.48***)

Table 2. Effects of CEOs' prenatal Superfund exposure on capital structure

This table reports coefficients from OLS regressions of *Cash/Assets*, *Leverage*, and *Ln*(1+*Share repurchase*) for fiscal year *t* on our CEOs' prenatal Superfund exposure measure and control variables (of lagged firms, lagged CEOs, and counties characteristics) with fixed effects. County-level variables are measured in the CEO's birth year and birth county. Variables are defined in Appendix A. Constant terms are not reported. *t*-values are based on robust standard errors clustered by CEO-firm and year (two-way) and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent variable	**Cash/Assets**	**Leverage**	**Ln(1+Share repurchase)**
	(1)	**(2)**	**(3)**
Ln(1+ CEO #Superfund exposure$_t$)	-0.0191*	0.0451***	-0.7948**
	(-1.66)	(2.92)	(-2.41)
Assets volatility$_{t-1}$	0.1149***	-0.1386***	
	(7.07)	(-8.15)	
Tobin's Q$_{t-1}$	-0.0027***	-0.0005	
	(-3.42)	(-0.53)	
Ln(Assets)$_{t-1}$	-0.0288***	-0.0050	0.4647***
	(-7.66)	(-1.23)	(6.90)
Capex$_{t-1}$	-0.1463***	0.0282	
	(-5.21)	(0.74)	
R&D$_{t-1}$	0.0869	-0.2185***	
	(1.00)	(-2.69)	
Dividend (0,1)$_t$	-0.0012	-0.0098*	
	(-0.30)	(-1.76)	
Cash flow/Assets$_{t-1}$	-0.0735***		
	(-3.09)		
NWC/Assets$_{t-1}$	-0.1274***		
	(-5.10)		
Acquisition/Assets$_{t-1}$	-0.1033***		
	(-6.90)		
Leverage$_t$	-0.0762***		-1.4735***
	(-5.17)		(-5.40)
ROA$_{t-1}$		-0.1184***	1.4795***
		(-6.44)	(3.31)
PP&E/Assets$_{t-1}$		0.0017	
		(0.07)	
Growth in sales$_{t-1}$		-0.0068*	-0.1384*
		(-1.92)	(-1.77)
Cash/Assets$_t$			-0.0227
			(-0.08)
Ln(CEO age)$_{t-1}$	-0.0687	0.1561	-2.7869
	(-0.51)	(0.82)	(-1.01)
Ln(1+CEO tenure)$_{t-1}$	-0.0052	0.0001	0.0465
	(-1.46)	(0.02)	(0.50)
CEO duality (0,1)$_{t-1}$	-0.0013	0.0169***	0.1238
	(-0.29)	(3.32)	(1.16)
Founder CEO (0,1)$_{t-1}$	0.0027	-0.0271	-0.6357*
	(0.24)	(-1.46)	(-1.92)
CEO ownership$_{t-1}$ (%)	-0.0000	0.0005	-0.0076
	(-0.16)	(1.63)	(-1.38)
Inst. ownership$_{t-1}$ (%)	0.0044	-0.0397***	-0.1777
	(0.40)	(-3.02)	(-0.80)
County poverty status	-0.0004	0.0001	0.0670*
	(-0.38)	(0.09)	(1.78)
County employment status	-0.0006*	0.0018***	-0.0144
	(-1.84)	(3.47)	(-1.39)
Ln(County earnings per capita)	-0.0201	0.0428**	0.2938
	(-1.47)	(2.40)	(0.64)
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes
Clustered by CEO-firm and year	Yes	Yes	Yes
Adj R^2	0.8553	0.7917	0.6950
Observations	8,298	8,955	9,136

Table 3. Effects of CEOs' prenatal Superfund exposure on corporate cost of borrowing

This table reports coefficients from OLS regressions of *Interest expense/Debt*, *Bank loan all-in-spread,* and *Bond issue spread* for fiscal year *t* on our CEOs' prenatal Superfund exposure measure and control variables (of lagged firms, lagged CEOs, loans/bonds, and counties characteristics) with fixed effects. Each observation in columns (2) and (3) corresponds to each loan/bond issue. Variables are defined in Appendix A. Constant terms are not reported. *t*-values are based on robust standard errors clustered by CEO-firm and year (two-way) and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent variable	**Interest expense/Debt**	**Bank loan all-in-spread**	**Bond issue spread**
	(1)	**(2)**	**(3)**
Ln(1+CEO #Superfund exposure$_t$)	0.3587	16.8135**	92.9586***
	(0.99)	(2.03)	(3.99)
Assets volatility$_{t-1}$	-0.0293		
	(-0.07)		
Tobin's Q$_{t-1}$	0.0054		
	(0.40)		
Ln(Assets)$_{t-1}$	-0.0565	5.3618	34.6749**
	(-0.88)	(1.21)	(2.40)
Capex$_{t-1}$	-2.2620		
	(-1.01)		
R&D$_{t-1}$	3.2572		
	(1.37)		
Dividend (0,1)$_{t-1}$	0.0559		
	(0.78)		
ROA$_{t-1}$	0.3256	-22.6039	-68.1358
	(1.54)	(-1.04)	(-0.96)
PP&E/Assets$_{t-1}$	-1.2891		
	(-1.30)		
Growth in sales$_{t-1}$	-0.0782		
	(-1.37)		
Ln(CEO age)$_{t-1}$	-4.9900		
	(-1.43)		
Ln(1+CEO tenure)$_{t-1}$	0.1295		
	(1.31)		
CEO duality (0,1)$_{t-1}$	-0.1219		
	(-0.90)		
Founder CEO (0,1)$_{t-1}$	-0.2733		
	(-1.03)		
CEO ownership$_{t-1}$ (%)	0.0387		
	(0.99)		
Inst. ownership$_{t-1}$ (%)	-0.4529		
	(-0.77)		
Credit rating$_{t-1}$		-11.2940***	2.0166
		(-12.84)	(0.70)
Previous lending relationship (0,1)$_t$		-6.5777***	
		(-4.71)	
Ln(Sales)$_{t-1}$		-1.3785	-24.1376
		(-0.31)	(-1.57)
Leverage$_{t-1}$		20.7259	19.2789
		(1.52)	(0.45)
Ln(Facility amount)$_t$		-12.5337***	
		(-8.71)	
Maturity (in months)$_t$		0.1243**	0.3210***
		(2.13)	(17.70)
Number of facilities$_t$		7.4039***	
		(5.01)	
Collateral (0,1)$_t$		58.2976***	-138.5135**
		(13.78)	(-2.42)

Financial covenants $(0,1)_t$		-1.9909	
		(-0.64)	
Prime base rate $(0,1)_t$		184.1533***	
		(11.48)	
Performance pricing $(0,1)_t$		-17.8439***	
		(-5.12)	
Ln(Amount)$_t$			-31.4236***
			(-7.26)
Covenants $(0,1)_t$			-8.1138
			(-0.96)
Callable $(0,1)_t$			-55.5740***
			(-3.59)
County poverty status	0.0048	-0.0303	5.3009
	(0.51)	(-0.01)	(1.54)
County employment status	0.0067	0.4013**	0.9394
	(0.65)	(2.19)	(1.01)
Ln(County earnings per capita)	-0.0393	4.1257	78.6634*
	(-0.31)	(0.36)	(1.78)
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes
Clustered by CEO-firm and year	Yes	Yes	Yes
Lead lender FE	No	Yes	No
Adj R^2	0.1295	0.8258	0.7672
Observations	7,833	11,693	6,273

Table 4. Effects of CEOs' prenatal Superfund exposure on equity risk

This table reports coefficients from OLS regressions of $\sigma_{Stock\ return}$, $\sigma_{Specific\ return}$, *Negative skewness*, $\sigma_{Down\text{-}to\text{-}up}$, and *Crash risk* for fiscal year *t* on our CEOs' prenatal Superfund exposure measure and control variables (of lagged firms, lagged CEOs, and counties characteristics) with fixed effects. Variables are defined in Appendix A. Constant terms are not reported. *t*-values are based on robust standard errors clustered by CEO-firm and year (two-way) and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent variable	**$\sigma_{Stock\ return}$**	**$\sigma_{Specific\ return}$**	**Negative skewness**	**$\sigma_{Down\text{-}to\text{-}up}$**	**Crash risk**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Ln(1+CEO #Superfund exposure$_t$)	0.0302**	0.0250	0.3497*	0.0835**	0.1755*
	(2.41)	(1.59)	(1.93)	(2.25)	(1.91)
Opacity$_{t-1}$			0.0051*	0.0012**	0.0016
			(1.95)	(2.21)	(1.25)
Stock return$_{t-1}$	0.0052***	-0.0004	0.0016	0.0083**	-0.0232**
	(3.27)	(-0.18)	(0.09)	(2.18)	(-2.35)
Ln(Assets)$_{t-1}$	-0.0217***	-0.0267***	0.1280***	0.0277***	0.0471**
	(-6.85)	(-7.11)	(3.81)	(3.84)	(2.46)
Ln(B/M)$_{t-1}$	0.0118***	0.0112***	-0.1868***	-0.0404***	-0.0794***
	(4.81)	(3.83)	(-6.84)	(-6.98)	(-5.12)
Leverage$_{t-1}$	0.0233**	0.0180	-0.0539	-0.0411	0.0118
	(2.01)	(1.25)	(-0.41)	(-1.46)	(0.16)
PP&E/Assets$_{t-1}$	-0.0063	-0.0003	-0.1293	-0.0754*	0.0282
	(-0.36)	(-0.02)	(-0.69)	(-1.83)	(0.24)
Cash/Assets$_{t-1}$	-0.0101	-0.0226	0.0587	-0.0341	0.0289
	(-0.71)	(-1.43)	(0.39)	(-1.10)	(0.34)
Dividend (0,1)$_{t-1}$	-0.0032	0.0068	0.0532	-0.0003	0.0364
	(-0.78)	(1.41)	(1.12)	(-0.03)	(1.40)
ROA$_{t-1}$	-0.0638***	-0.0201*	0.2813***	0.0759***	0.0660
	(-4.32)	(-1.75)	(3.48)	(3.89)	(1.44)
Growth in sales$_{t-1}$	0.0010	0.0019	-0.0278	-0.0029	-0.0294
	(0.55)	(1.28)	(-0.91)	(-0.42)	(-1.29)
Ln(CEO age)$_{t-1}$	0.0029	-0.3918**	-2.4956	-0.3131	-1.0368
	(0.02)	(-2.47)	(-1.55)	(-0.91)	(-1.16)
Ln(1+CEO tenure)$_{t-1}$	0.0072*	0.0080*	0.0741*	0.0141*	0.0381
	(1.92)	(1.96)	(1.83)	(1.69)	(1.61)
CEO duality (0,1)$_{t-1}$	0.0034	0.0051	0.0370	0.0073	0.0048
	(0.72)	(0.99)	(0.81)	(0.74)	(0.17)
Founder CEO (0,1)$_{t-1}$	0.0375***	0.0185	0.0607	0.0279	-0.0158
	(3.02)	(1.07)	(0.34)	(0.77)	(-0.16)
CEO ownership$_{t-1}$ (%)	0.0005**	0.0003	0.0010	-0.0001	0.0007
	(1.96)	(0.97)	(0.32)	(-0.22)	(0.41)
Inst. ownership$_{t-1}$ (%)	-0.0457***	-0.0070	0.1801*	0.0508**	0.0973
	(-4.67)	(-0.61)	(1.69)	(2.28)	(1.56)
Ln(1+CEO Vega)$_{t-1}$	-0.0016	0.0011	-0.0069	-0.0001	0.0125*
	(-1.63)	(0.91)	(-0.54)	(-0.04)	(1.81)
Ln(1+CEO Delta)$_{t-1}$	0.0007	0.0018	0.0258**	0.0071***	0.0118
	(0.61)	(1.26)	(2.09)	(2.77)	(1.57)
County poverty status	-0.0016	-0.0010	-0.0318***	-0.0046*	-0.0097
	(-1.52)	(-0.76)	(-2.57)	(-1.71)	(-1.42)
County employment status	0.0022***	0.0021***	0.0082*	0.0018**	0.0027
	(7.60)	(4.88)	(1.81)	(2.04)	(1.21)
Ln(County earnings per capita)	0.0424***	0.0120	0.0350	0.0374	0.0171
	(3.08)	(0.64)	(0.19)	(1.00)	(0.19)
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes	Yes
Clustered by CEO-firm and year	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.8591	0.7483	0.2435	0.2442	0.2288
Observations	8,458	7,795	8,036	8,036	8,037

Table 5. Effects of acquirer CEOs' prenatal Superfund exposure on M&A announcement abnormal returns and the propensity of unrelated acquisitions

Columns (1) and (2) of this table report, respectively, coefficients from OLS regressions of acquirers' *CAR*(-1,1) *Market model* announcement returns and acquirers' *CAR*(-1,1) *FF4 model* announcement returns for fiscal year *t* on the acquirers CEOs' prenatal Superfund exposure measure and control variables (of acquirers, acquirer CEOs, M&A deal characteristics, and counties characteristics) with fixed effects. In columns (3) and (4), we use probit and linear probability models, respectively, to regress unrelated acquisitions (0,1) for fiscal year *t* on the same explanatory variables with fixed effects as columns (1) and (2). Each observation corresponds to each M&A announcement. Variables are defined in Appendix A. Constant terms are not reported. *t*-values are based on robust standard errors clustered by CEO-acquirer and year (two-way) and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent variable	**CAR(-1,1) Market model**	**CAR(-1,1) FF4 model**	**Unrelated acquisition (0,1) (Probit)**	**Unrelated acquisition (0,1) (Linear probability)**
	(1)	**(2)**	**(3)**	**(4)**
Ln(1+ CEO #Superfund exposure$_t$)	-0.0081***	-0.0063**	0.2816***	0.0751***
(acquirer)	(-2.64)	(-2.06)	(2.76)	(2.86)
All stock (0,1)	-0.0035	-0.0025	0.0033	0.0083
	(-1.07)	(-0.76)	(0.04)	(0.35)
% acquired	-0.0002***	-0.0002***	0.0014	0.0004
	(-3.45)	(-3.70)	(1.09)	(1.13)
Hostile (0,1)	-0.0160	-0.0177	0.7528**	0.2090*
	(-1.21)	(-1.40)	(2.01)	(1.93)
Competing bidders	-0.0039	-0.0030	-0.7188***	-0.1431***
	(-0.50)	(-0.42)	(-3.64)	(-3.43)
Tender offer (0,1)	0.0216***	0.0202***	-0.3027**	-0.0663**
	(5.41)	(5.11)	(-2.47)	(-2.18)
Termination fees (0,1)	-0.0058	-0.0048	0.0612	0.0129
	(-1.53)	(-1.28)	(0.55)	(0.47)
Public status (target) (0,1)	-0.0112***	-0.0110***	-0.2091**	-0.0483*
	(-3.11)	(-3.18)	(-1.98)	(-1.86)
Toehold (0,1)	-0.0026	-0.0019	0.0170	0.0086
	(-0.60)	(-0.45)	(0.14)	(0.28)
Ln(Assets)$_{t-1}$ (acquirer)	-0.0029***	-0.0026***	0.1254***	0.0352***
	(-3.79)	(-3.38)	(5.29)	(5.69)
Ln(B/M)$_{t-1}$(acquirer)	0.0015	0.0020	0.0099	-0.0037
	(0.37)	(0.45)	(0.09)	(-0.15)
Leverage$_{t-1}$(acquirer)	0.0188***	0.0198***	-0.1751	-0.0364
	(2.85)	(2.92)	(-0.83)	(-0.68)
Cash/Assets$_{t-1}$(acquirer)	-0.0097	-0.0087	-0.3500	-0.0509
	(-1.18)	(-1.05)	(-1.44)	(-0.86)
CAR(-131,-31) (acquirer)	-0.013***	-0.0121***	-0.0351	-0.0100
	(-4.73)	(-4.13)	(-0.48)	(-0.55)
Ln(CEO age)$_{t-1}$ (acquirer)	-0.1123	-0.1117	-0.1626	0.2989
	(-1.45)	(-1.34)	(-0.07)	(0.54)
Ln(1+CEO tenure)$_{t-1}$ (acquirer)	-0.0025*	-0.0019	0.0481	0.0052
	(-1.67)	(-1.31)	(1.03)	(0.42)
CEO duality (0,1)$_{t-1}$ (acquirer)	0.0016	0.0009	0.1179*	0.0328*
	(0.72)	(0.39)	(1.69)	(1.80)
Founder CEO (0,1)$_{t-1}$ (acquirer)	-0.0045	-0.0052	0.0269	-0.0058
	(-1.00)	(-1.16)	(0.25)	(-0.21)
County poverty status	0.0003	0.0004	-0.0096	-0.0027
	(0.82)	(1.05)	(-0.89)	(-0.97)
County employment status	-0.0000	0.0001	-0.0099*	-0.0013
	(-0.01)	(0.34)	(-1.81)	(-1.27)
Ln(County earnings per capita)	0.0079*	0.0081**	-0.0317	-0.0069
	(1.96)	(2.03)	(-0.21)	(-0.18)
Acquirer industry, Year, Birth Year, Birth County, and Acquirer HQ State FE	Yes	Yes	Yes	Yes
Clustered by CEO-Acquirer and year	Yes	Yes	Yes	Yes
Adj R^2	0.1670	0.1645	0.3345	0.4258
Observations	6,798	6,798	6,065	6,798

Table 6. Effects of CEOs' prenatal Superfund exposure on industry-adjusted firm internal efficiency

This table presents coefficients from OLS regressions of firm internal efficiency measures (*Cash conversion cycle* (*CCC*)*, Asset turnover, Capital Expenditure efficiency, Employee productivity, and Layoff severity*) for fiscal year *t* as the dependent variables and includes interactions of industry- with year-fixed effects (industry × year fixed effect), following Gormley and Matsa (2014). In addition, it controls for the CEO's birth year, county of birth, and firm's headquarters state fixed effects. Variables are defined in Appendix A. Constant terms are not reported. *t*-values are based on robust standard errors clustered by CEO-firm and year (two-way) and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent variable	**CCC (Sales)**	**CCC (Revenue)**	**Asset turnover**	**Capex efficiency (REVT/CAPX)**	**Employee productivity (REVT/EMP)**	**Layoff severity**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Ln(1+CEO #Superfund exposure)	-0.4060***	-0.5102***	0.0475**	-0.0444	0.0683**	0.0548
	(-3.17)	(-4.40)	(2.10)	(-1.56)	(2.52)	(0.50)
Ln(Local peers)$_{t-1}$	0.0951	-0.1436**	-0.0736***	-0.0104	0.0418***	-0.1150**
	(1.50)	(-2.37)	(-7.38)	(-0.66)	(3.59)	(-2.21)
Non-compete index	-0.1648	-0.1919	-0.0270	-0.0277	-0.0294	-0.1993
	(-1.03)	(-1.32)	(-1.04)	(-0.76)	(-1.12)	(-1.22)
Ln(Assets)$_{t-1}$	-0.0233	-0.0863**	NA	-0.0196**	0.0892***	0.3065***
	(-0.63)	(-2.42)		(-2.29)	(11.97)	(10.19)
$\sigma_{\text{Stock return},t-1}$	-0.2187	-0.5282	0.1326	0.3981**	0.2860	4.0128***
	(-0.33)	(-0.88)	(1.09)	(2.30)	(1.40)	(6.35)
Ln(B/M)$_{t-1}$	0.3649***	0.3366***	-0.1498***	0.1060***	-0.0256**	0.5685***
	(6.11)	(6.25)	(-14.46)	(7.52)	(-1.99)	(10.75)
TNIC total similarity$_{t-1}$	-0.0518***	-0.0389***	-0.0036***	-0.0023	0.0027***	-0.0040
	(-7.56)	(-4.15)	(-5.71)	(-1.53)	(3.14)	(-0.97)
PP&E/Sales$_{t-1}$	-0.9303***	-0.9012***	NA	-0.4832***	-0.0169	-0.1273
	(-3.48)	(-3.25)		(-3.65)	(-1.10)	(-1.33)
Leverage$_{t-1}$	1.8265***	0.5491*	-0.3371***	0.1955*	0.2808***	1.4948***
	(5.15)	(1.78)	(-8.08)	(1.86)	(3.31)	(5.84)
Intangibles$_{t-1}$	-0.3935***	-0.3773***	NA	0.0580***	0.0936***	-0.0143
	(-9.88)	(-9.45)		(5.00)	(8.67)	(-0.43)
Dividend yield$_{t-1}$	0.0186	0.2580	-0.0147	0.1400	-0.2662	2.6592**
	(0.04)	(0.68)	(-0.15)	(0.76)	(-1.59)	(2.27)
Ln(CEO age)$_{t-1}$	0.8919	3.4013	-0.3110	-0.0233	-0.6933	0.6328
	(0.29)	(1.15)	(-0.57)	(-0.03)	(-0.92)	(0.23)
Ln(1+CEO tenure)$_{t-1}$	-0.0980	-0.0363	0.0294***	-0.0236	0.0174	-0.0708
	(-1.37)	(-0.53)	(2.56)	(-1.51)	(1.32)	(-1.16)
CEO duality (0,1)$_{t-1}$	-0.0561	-0.0592	-0.0646***	0.0175	-0.0443**	0.1014
	(-0.62)	(-0.68)	(-4.23)	(0.87)	(-2.09)	(1.30)
Founder CEO (0,1)$_{t-1}$	-0.4349***	-0.5317***	-0.0081	-0.0551*	0.1158***	-0.4858***
	(-2.83)	(-3.78)	(-0.33)	(-1.78)	(4.63)	(-4.31)
CEO ownership$_{t-1}$ (%)	0.0316***	0.0237***	0.0076***	0.0042**	-0.0070***	0.0174***
	(4.89)	(4.12)	(5.48)	(2.04)	(-4.46)	(2.96)
Inst. ownership$_{t-1}$ (%)	0.7152***	0.4456**	0.0761*	-0.1480***	0.0013	-0.9761***
	(3.08)	(2.04)	(1.92)	(-2.58)	(0.02)	(-4.49)
Ln(1+Delta)$_{t-1}$	0.0147	0.0379	-0.0368***	-0.0319***	-0.0052***	-0.2034***
	(0.41)	(1.13)	(-7.99)	(-3.96)	(4.20)	(-7.02)
County poverty status	0.0553***	0.0196*	0.0034	0.0160***	-0.0052**	0.0177*
	(3.82)	(1.76)	(1.48)	(5.99)	(-2.07)	(1.73)
County employment status	0.0057	-0.0113*	0.0031***	-0.0004	0.0016	-0.0040
	(0.89)	(-1.90)	(4.78)	(-0.37)	(1.22)	(-0.88)
Ln(County earnings per capita)	0.3187**	0.1118	0.0975***	0.1127***	-0.0384	0.0990
	(2.03)	(0.80)	(3.52)	(3.50)	(-1.23)	(0.74)
Industry×Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered by CEO-firm and year	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.7847	0.7129	0.7636	0.7439	0.7324	0.3656
Observations	10,096	8,989	10,850	9,950	10,478	10,470

Table 7. Effects of CEOs' prenatal Superfund exposure on industry-adjusted firm performance

This table presents coefficients from OLS regressions of firm performance (*ROA*, *Tobin's Q,* and *Stock return*) for fiscal year *t* as the dependent variable and includes interactions of industry- with year-fixed effects (industry × year fixed effect), following Gormley and Matsa (2014). In addition, it controls for the CEO's birth year, county of birth, and firm's headquarters state fixed effects. Variables are defined in Appendix A. Constant terms are not reported. *t*-values are based on robust standard errors clustered by CEO-firm and year (two-way) and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent variable	**ROA**	**Tobin's Q**	**Stock return**
	(1)	**(2)**	**(3)**
Ln(1+CEO #Superfund exposure$_t$)	-0.0177***	-0.0993***	-0.0528**
	(-3.38)	(-2.90)	(-2.17)
Ln(Local peers)$_{t-1}$	-0.0007	0.0880***	-0.0024
	(-0.27)	(5.25)	(-0.19)
Non-compete index	0.0077**	0.0509*	0.0553**
	(2.13)	(1.90)	(2.29)
Ln(Assets)$_{t-1}$	0.0058***	-0.0625***	-0.0181*
	(3.57)	(-5.85)	(-1.80)
Ln(B/M)$_{t-1}$	-0.0502***	-0.8690***	0.1184***
	(-9.17)	(-28.01)	(5.67)
TNIC total similarity$_{t-1}$	-0.0002**	0.0010	0.0004
	(-1.97)	(0.94)	(0.36)
PP&E/Sales$_{t-1}$	-0.0079	0.0772***	-0.0116
	(-1.32)	(3.25)	(-0.78)
Leverage$_{t-1}$	-0.0964***	-1.3666***	0.1828**
	(-7.47)	(-17.13)	(2.19)
Intangibles$_{t-1}$	-0.0119***	0.0471***	0.0167
	(-3.46)	(2.86)	(1.57)
Dividend yield$_{t-1}$	0.0284	-0.0243	-0.2487
	(0.95)	(-0.12)	(-1.34)
Ln(CEO age)$_{t-1}$	0.2232	0.3929	0.3162
	(0.83)	(0.40)	(0.45)
Ln(1+CEO tenure)$_{t-1}$	0.0045	-0.0058	-0.0100
	(1.07)	(-0.30)	(-0.52)
CEO duality (0,1)$_{t-1}$	-0.0112**	-0.0673***	0.0202
	(-2.51)	(-2.75)	(0.93)
Founder CEO (0,1)$_{t-1}$	-0.0053	0.1375***	0.0528*
	(-0.89)	(3.28)	(1.75)
CEO ownership$_{t-1}$ (%)	0.0006	-0.0044*	0.0008
	(1.38)	(-1.91)	(0.49)
Inst. ownership$_{t-1}$ (%)	0.0693***	-0.0163	-0.2260***
	(3.75)	(-0.24)	(-3.66)
Ln(1+CEO Vega)$_{t-1}$	0.0003	-0.0175**	-0.0038
	(0.17)	(-2.42)	(-0.62)
Ln(1+CEO Delta)$_{t-1}$	0.0028	0.0829***	-0.0118
	(0.92)	(7.00)	(-1.30)
County poverty status	-0.0005	-0.0071**	-0.0011
	(-1.54)	(-2.15)	(-0.33)
County employment status	0.0005	-0.0003	-0.0007
	(1.25)	(-0.17)	(-0.38)
Ln(County earnings per capita)	-0.0017	-0.0381	0.0001
	(-0.39)	(-0.94)	(0.00)
Industry×Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes
Clustered by CEO-firm and year	Yes	Yes	Yes
Adj R^2	0.3535	0.7283	0.3507
Observations	10,433	10,344	10,421

Table 8. Effects of CEOs' prenatal Superfund exposure on their career outcomes

This table presents coefficients from OLS and probit regressions predicting the natural logarithm of one plus the length of CEO tenure and CEO turnover, respectively. Specifically, we regress the natural logarithm of one plus the length of CEO tenure (model 1), CEO forced turnover, generic turnover, and severance payment if turnover (models 2 to 4) on our CEOs' prenatal Superfund exposure measure and control variables (of lagged firms, lagged industries, lagged CEOs, and counties characteristics) with fixed effects. Variables are defined in Appendix A. Constant terms are not reported. Z-values are based on robust standard errors clustered by CEO-firm and year (two-way) and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent variable	**Ln(1+CEO tenure)**	**Forced CEO turnover (0,1)**	**Generic CEO turnover (0,1)**	**Severance payment if CEO turnover (0,1)**
	(1)	**(2)**	**(3)**	**(4)**
Ln(1+CEO #Superfund exposure$_t$)	-0.0517**	0.2727***	0.0236	-0.0402
	(-2.43)	(3.21)	(0.30)	(-0.36)
Ln(Local peers)$_{t-1}$	-0.0266***	0.0762**	0.0148	0.0305
	(-2.71)	(2.03)	(0.41)	(0.59)
Non-compete index	0.0338	-0.0414	-0.2064**	0.0178
	(1.43)	(-0.42)	(-2.31)	(0.13)
Ind. return percentile$_{t-1}$	-0.0001	0.0007	-0.0004	-0.0003
	(-0.78)	(0.96)	(-0.64)	(-0.31)
Ind. return risk$_{t-1}$	0.1113	0.1564	-0.1711	1.5798
	(0.27)	(0.08)	(-0.10)	(0.71)
Ln(Assets)$_{t-1}$	-0.1080***	0.0708***	0.0240	0.0130
	(-19.39)	(3.40)	(1.12)	(0.44)
Tobin's Q$_{t-1}$	-0.0051***	0.0011	-0.0053	-0.0105**
	(-5.55)	(0.30)	(-1.48)	(-2.11)
CEO age≥ 60 (0,1)$_{t-1}$	2.0523***	-0.1241*	0.3544***	0.1463*
	(3.65)	(-1.75)	(5.80)	(1.73)
Ln(1+CEO tenure)$_{t-1}$		-0.0373	0.2381***	0.2979***
		(-0.86)	(5.69)	(4.95)
Outside CEO (0,1)$_{t-1}$	0.0087	-0.0478	0.0360	-0.0067
	(0.53)	(-0.84)	(0.63)	(-0.09)
Founder CEO (0,1)$_{t-1}$	0.4289***	0.0688	-0.1686**	-0.3436***
	(18.23)	(0.87)	(-1.97)	(-2.81)
CEO duality (0,1)$_{t-1}$	0.2360***	-0.1744***	0.0390	0.0865
	(15.83)	(-2.92)	(0.68)	(1.05)
CEO ownership$_{t-1}$ (%)	0.0054***	0.0118***	-0.0199***	-0.0102
	(4.55)	(3.24)	(-3.49)	(-1.55)
CEO employment contract (0,1)$_{t-1}$	-0.1275***	-0.0457	-0.1245**	3.2167***
	(-9.24)	(-0.85)	(-2.39)	(9.67)
Inst. ownership$_{t-1}$ (%)	-0.0331	-0.1545	-0.0309	-0.2138
	(-0.85)	(-1.01)	(-0.21)	(-1.12)
Ln(1+CEO Vega)$_{t-1}$	0.0217***	0.0139	0.0099	-0.0006
	(5.45)	(0.92)	(0.67)	(-0.03)
Ln(1+CEO Delta)$_{t-1}$	0.0913***	-0.0728***	-0.0520***	-0.0598**
	(16.77)	(-3.86)	(-2.74)	(-2.18)
County poverty status	0.0003	-0.0097	0.0095	0.0224*
	(0.14)	(-1.04)	(1.15)	(1.71)
County employment status	0.0045***	0.0009	-0.0018	-0.0043
	(4.19)	(0.26)	(-0.38)	(-0.52)
Ln(County earnings per capita)	0.1194***	-0.0628	-0.1933*	-0.1023
	(4.18)	(-0.55)	(-1.80)	(-0.75)
Industry, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes
Clustered by CEO-firm and year	Yes	Yes	Yes	Yes
Adj R^2/Pseudo R^2	0.6110	0.3404	0.1545	0.2875
Observations	10,962	7,637	9,929	8,589

Table 9. Effects of CEOs' prenatal Superfund exposures on the origin of CEOs

This table presents coefficients from probit regression of the effect of prenatal Superfund exposures on the likelihood of outside CEO (a dummy variable set equal to one if the individuals joined the firm and became CEO in no more than two years and zero otherwise) and family firm appointments. Family firm (0,1) is defined as one in firm-years where members of the founding family continue to hold positions in top management, are on the board, or are blockholders of the company, and zero otherwise. Family $firm_{non\text{-}exec}$ (0,1) is defined as one in firm-years where members of the founding family continue to be on the board or are blockholders of the company and zero otherwise. Family $firm_{Exec}$ (0,1) is defined as one in firm-years where members of the founding family continue to be top management of the companies, and zero otherwise. County-level variables are measured in the CEO's birth year and birth county. Variables are defined in Appendix A. Constant terms are not reported. Z-values are based on robust standard errors clustered by CEO-firm and year (two-way) and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent variable	**Outside CEO (0,1)**	**Family firm (0,1)**	**Outside CEO (0,1)**	**Outside CEO (0,1)**	**Outside CEO (0,1)**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Ln(1+CEO #Superfund $exposure_t$)	-0.4188**	1.0367***	-0.7164***	-0.6390***	-0.4289**
	(-2.48)	(3.56)	(-3.89)	(-3.69)	(-2.32)
Family firm (0,1)			-1.0799***		
			(-7.05)		
Ln(1+CEO #Superfund $exposure_t$) × Family firm			1.2535***		
			(5.57)		
Family $firm_{non\text{-}exec}$ (0,1)				-0.0618	
				(-0.41)	
Ln(1+CEO #Superfund $exposure_t$) × Family $firm_{non\text{-}exec}$				1.3233***	
				(5.60)	
Family $firm_{Exec}$ (0,1)					-2.3256***
					(-8.62)
Ln(1+CEO #Superfund $exposure_t$) × Family $firm_{Exec}$					0.5468
					(1.32)
Departing forced CEO turnover (0,1)	0.6390***	0.0357	0.7316***	0.6537***	0.7511***
	(6.64)	(0.32)	(7.16)	(6.59)	(7.24)
$Ln(Local\ peers)_{t-1}$	0.1925**	-0.0882	0.2197***	0.2401***	0.3035***
	(2.53)	(-1.11)	(2.91)	(2.96)	(3.84)
Non-compete index	-0.2047	-0.8604**	-0.2369	-0.2833	-0.2206
	(-1.03)	(-2.26)	(-1.12)	(-1.27)	(-1.06)
Ind. return $percentile_{t-1}$	0.0003	0.0001	0.0004	0.0002	0.0006
	(0.21)	(0.11)	(0.28)	(0.16)	(0.47)
Firm abnormal return $percentile_{t-1}$	-0.0007	0.0024	-0.0001	-0.0002	-0.0005
	(-0.49)	(1.63)	(-0.08)	(-0.15)	(-0.35)
Ind. return $risk_{t-1}$	6.4275**	6.4060*	5.3778**	6.2980**	6.3811**
	(2.36)	(1.92)	(1.99)	(2.34)	(2.19)
Firm abnormal return $volatility_{t-1}$	5.1498***	0.5765	4.5419***	4.5504***	4.8811***
	(5.07)	(0.51)	(4.36)	(4.34)	(4.62)
$Ln(Assets)_{t-1}$	-0.3100***	-0.1492***	-0.3605***	-0.3325***	-0.3119***
	(-8.02)	(-3.23)	(-9.32)	(-8.59)	(-7.83)
Tobin's Q_{t-1}	-0.0340***	0.0270***	-0.0317***	-0.0391***	-0.0290***
	(-4.95)	(3.59)	(-4.71)	(-5.91)	(-4.07)
Departing CEO age	-1.6888***	3.9162***	-1.1840**	-1.4423***	-0.9836*
	(-3.45)	(5.04)	(-2.40)	(-2.96)	(-1.90)
Ln(1+ Departing CEO tenure)	-0.3840***	-0.0308	-0.3412***	-0.3221***	-0.4217***
	(-4.76)	(-0.25)	(-4.17)	(-3.88)	(-4.92)
Departing Founder CEO (0,1)	-0.1810	3.5356***	-0.0035	-0.3779**	-0.1018
	(-1.11)	(13.66)	(-0.02)	(-2.32)	(-0.59)
Departing CEO duality (0,1)	0.1668	-2.2279***	-0.0019	0.2194*	-0.0152
	(1.36)	(-9.13)	(-0.01)	(1.76)	(-0.12)

Departing CEO employment contract (0,1)	0.2311**	0.4041***	0.2417**	0.1403	0.2811**
	(2.19)	(2.61)	(2.26)	(1.31)	(2.48)
Inst. ownership$_{t-1}$ (%)	0.3146	-2.1893***	0.1486	0.3649	0.3556
	(1.10)	(-5.94)	(0.51)	(1.24)	(1.15)
Outside directors$_{t-1}$ (%)	1.3615***	-4.4971***	1.0026***	1.6443***	0.8689***
	(4.71)	(-10.15)	(3.43)	(5.61)	(2.85)
County poverty status	-0.0884***	0.0567***	-0.0830***	-0.0922***	-0.0966***
	(-5.91)	(2.62)	(-5.38)	(-5.86)	(-6.32)
County employment status	-0.0026	0.0263***	0.0002	-0.0020	-0.0022
	(-0.65)	(3.89)	(0.05)	(-0.49)	(-0.43)
Ln(County earnings per capita)	-0.9880***	1.6309***	-0.8713***	-1.0241***	-1.0991***
	(-3.17)	(4.14)	(-2.79)	(-3.22)	(-3.50)
Industry, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes	Yes
Clustered by CEO-firm and year	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.4714	0.6535	0.4879	0.4846	0.5047
Observations	2,980	3,269	2,980	2,980	2,980

Table 10. Effects of CEOs' prenatal Superfund exposures on their incentive compensation contracts

This table reports coefficients from OLS regressions of CEO *delta, vega,* and the *proportion of options* (value of option grants as a percentage of total compensation) for fiscal year *t* on our CEOs' prenatal Superfund exposure measure and control variables (of lagged firms, lagged CEOs, and counties characteristics) with fixed effects. Variables are defined in Appendix A. Constant terms are not reported. *t*-values are based on robust standard errors clustered by CEO-firm and by year (two-way) and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent variable	**Ln(1+CEO Delta)**	**Ln(1+CEO Vega)**	**Proportion of options**
	(1)	**(2)**	**(3)**
Ln(1+CEO #Superfund exposure$_t$)	-0.2337*	-0.3707***	-0.0185
	(-1.95)	(-3.29)	(-1.06)
Ln(Sales)$_t$	0.2882***	0.2953***	-0.0063
	(9.60)	(9.24)	(-1.15)
Leverage$_t$	0.0405	0.0091	-0.0540**
	(0.29)	(0.07)	(-2.07)
Tobin's Q$_t$	0.2189***	-0.0568***	0.0110***
	(12.88)	(-3.48)	(3.38)
Growth in sales$_t$	-0.0080	-0.0017	-0.0018
	(-0.57)	(-0.15)	(-0.73)
CEO Salarycomp$_t$	-1.5922***	-1.0760***	-0.6623***
	(-19.20)	(-14.19)	(-45.10)
Ln(CEO age)$_t$	5.9412***	0.5546	-0.5215**
	(3.50)	(0.34)	(-2.13)
Ln(1+CEO tenure)$_t$	0.5305***	0.2961***	-0.0187***
	(16.21)	(9.66)	(-3.73)
PP&E/Assets$_t$	-0.8411***	-0.4503**	0.0333
	(-4.94)	(-2.51)	(0.99)
Cash/Assets$_t$	-0.1163	0.0252	0.0182
	(-0.76)	(0.17)	(0.63)
Dividend (0,1)$_t$	0.0637	0.0860*	-0.0149*
	(1.44)	(1.86)	(-1.73)
NOL carryforward (0,1)$_t$	0.0003	0.0215	-0.0061
	(0.01)	(0.61)	(-1.01)
ROA$_t$	-0.1547	0.4289***	-0.0565*
	(-1.21)	(3.05)	(-1.77)
Bankruptcy score$_t$	-0.1527***	0.0208	0.0233***
	(-7.15)	(1.18)	(6.06)
Stock return$_t$	-0.0245	-0.0535**	-0.0067
	(-0.76)	(-2.45)	(-1.23)
Stock return$_{t-1}$	0.0694***	-0.0491***	-0.0069**
	(4.40)	(-3.42)	(-2.02)
County poverty status	0.0294***	0.0407***	0.0001
	(3.00)	(4.03)	(0.10)
County employment status	-0.0045	0.0018	0.0000
	(-1.08)	(0.55)	(0.06)
Ln(County earnings per capita)	0.0140	0.2428**	0.0495***
	(0.13)	(2.26)	(2.81)
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes
Clustered by CEO-firm and year	Yes	Yes	Yes
Adj R^2	0.7897	0.8076	0.6610
Observations	14,433	14,022	14,439

Table 11. Second-stage regression results from the two-stage least squares estimation

This table repeats tests in Tables 2 to 7 by reporting the second-stage regressions results from two-stage least squares estimation. The instrument for *Ln*(1+*CEO #Superfund exposure)* is the total number of births by county of the mother's legal residence scaled by the total number of births by state of the mother's legal residence in the CEO birth year. In each case, we control for the same control variables as in the corresponding previous tables. *t*-values are based on robust standard errors clustered by CEO-firm and by year (two-way) and are reported in parentheses. The Cragg and Donald (1993) Wald F-statistic is reported to assess weak identification. Variables are defined in Appendix A. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Corresponding table	**2**	**2**	**2**	**3**	**3**	**3**
Dependent variable	**Cash/Assets**	**Leverage**	**Ln(1+Share repurchase)**	**Interest expense/Debt**	**Bank loan all-in-spread**	**Bond issue spread**
	(1)	**(2)**	**(3)**	**(9)**	**(10)**	**(11)**
Predicted Ln(1+CEO #Superfund exposure$_t$)	-0.1954	0.8510**	-1.5991	-2.3910	1622.198	1617.981*
	(-1.31)	(2.33)	(-0.50)	(-0.95)	(0.98)	(1.79)
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes	Yes	Yes
Cragg-Donald Wald F-statistic	49.535***	49.361***	70.978***	25.332**	3.505	33.361***
Lead lender FE				No	Yes	No
Adj R^2	0.8516	0.7173	0.6950	0.1262	0.1176	0.6429
Observations	8,278	8,932	9,113	7,811	11,673	6,273

Corresponding table	**4**	**4**	**4**	**4**	**4**
Dependent variable	**$\sigma_{Stock\ return}$**	**$\sigma_{Specific\ return}$**	**Negative skewness**	**$\sigma_{Down\text{-}to\text{-}up}$**	**Crash risk**
	(12)	**(13)**	**(14)**	**(15)**	**(16)**
Predicted Ln(1+CEO #Superfund exposure$_t$)	0.2047*	-0.1239	3.9706*	0.6318*	0.4606
	(1.96)	(-0.71)	(1.91)	(1.67)	(0.52)
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes	Yes
Cragg-Donald Wald F-statistic	81.368***	69.507***	116.003***	116.003***	116.003***
Adj R^2	0.8555	0.7458	0.1939	0.2185	0.2278
Observations	8,435	7,773	8,013	8,013	8,014

Corresponding table	**5**	**5**	**5**	**6**	**6**	**6**
Dependent variable	**CAR(-1,1) Market model**	**CAR(-1,1) FF4 model**	**Unrelated acquisition (0,1)**	**ROA**	**Tobin's Q**	**Stock return**
	(17)	**(18)**	**(19)**	**(20)**	**(21)**	**(22)**
Predicted Ln(1+CEO #Superfund exposure$_t$)	-0.0548***	-0.0576***	0.4869**	-0.1104*	-0.9832***	-0.3014**
	(-2.62)	(-2.76)	(2.23)	(-1.82)	(-3.22)	(-2.20)
(Acquirer) industry, Year, (or Industry×Year), Birth Year, Birth County, and (Acquirer) HQ State FE	Yes	Yes	Yes	Yes	Yes	Yes
Cragg-Donald Wald F-statistic	15.354*	15.354*	169.677***	237.499***	237.639***	236.986***
Adj R^2	0.1296	0.1188	0.3990	0.3254	0.7031	0.3448
Observations	6,780	6,780	6,780	10,406	10,317	10,394

Corresponding table	**7**	**7**
Dependent variable	**Ln(1+CEO tenure)**	**Forced CEO turnover (0,1)**
	(23)	**(24)**
Predicted Ln(1+CEO #Superfund exposure$_t$)	0.0505	1.6506***
	(0.41)	(3.43)
Industry, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes
Cragg-Donald Wald F statistic	272.903***	273.663***
Pseudo R^2/Adj R^2	0.6092	0.7324
Observations	10,930	7,615

Internet Appendix

Tainted beginnings, Risky endings: The effect of inadvertent prenatal pollution exposure on CEO risk-taking

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This Internet Appendix presents additional analyses and related findings for our paper "Tainted beginnings, Risky endings: The effect of inadvertent prenatal pollution exposure on CEO risk-taking".

Table IA1. Summary statistics for the Superfund program 1981-2018

This Table presents summary statistics on Superfund sites placed on the NPL before December 31, 2018. The duration (in years) of accumulation of the worst hazardous contaminants at the later-designated NPL sites is the period of rendering the later-designated NPL sites.

	Observations
Number of Superfund sites proposed to NPL	1,803
1981–1985	796
1986–1989	418
1990–1994	122
1995–1999	127
2000–2004	124
2005–2009	79
2010–2014	86
2015–2018	51

	Mean	Median	First quartile	Third quartile	Standard deviation	Observations
Duration (in years) of accumulation of the worst hazardous contaminants at the later-designated NPL sites	25.519	19.000	11.000	32.000	22.782	1,786
Hazard Ranking System scores	43.850	43.70	35.108	50.000	9.961	1,780
Size of Superfund site (in acres)	6852.15	38.00	9.50	200.00	81,812.34	1,783
Superfund cleanup durations (years) from NPL proposal date until:						
Remedial action started date	8.583	7.831	5.235	11.088	4.996	1,406
Construction completion date	13.201	12.358	9.211	16.250	6.035	1,205
Deletion from NPL date	15.238	13.693	10.448	19.750	7.487	412
Reuse and redevelopment date	24.002	24.128	20.803	27.925	5.937	871
Contaminated environmental media						
Air medium	4.881%	0.000%	0.000%	0.000%	21.553%	1,803
Ground medium	82.03%	100.000%	100.00%	100.00%	38.404%	1,803
Water medium	87.97%	100.000%	100.00%	100.00%	32.547%	1,803

Table IA2. Comparisons of proportions of Superfund infants, infant mortality rates, and low birthweight rates

Panel A compares the percentage of Superfund CEOs among all CEOs in our sample with the percentage of Superfund infants (newborns in a county with at least one Superfund site during its actively polluting period) among all infants. Panel B and C compare the infant mortality rates and low birthweight rates, respectively, between counties with Superfund sites during the pollutant-accumulation periods and (1) all counties, (2) counties with Superfund sites during periods before or after the pollutant-accumulation periods, or (3) counties without Superfund sites. Newborns weighing less than 2,500 grams are classified as low birthweight newborns. ***, **, and * denote a significant difference at the 1%, 5%, and 10% level, respectively. Tests of differences in means (medians) are two-sample t-tests (Kruskal-Wallis H tests), and one of the two samples is the sample of counties during pollutant-accumulation periods. Data for infant mortality and low birthweight rates are from Bailey et al. (2016) U.S. County-Level Natality and Mortality Data, 1915-2007 (available at https://www.openicpsr.org/openicpsr/project/100229/version/V4/view).

Panel A. Comparison of the percentage of Superfund CEOs and the percentage of Superfund infants

	Percentage of Superfund infants among all infants	Percentage of Superfund CEOs among all CEOs
Annual mean	30.3749%	24.4585% (=734/(734+2,267))

Panel B. Comparison of infant mortality rates

	Infant mortality rate in all counties	Infant mortality rate in counties during pollutant-accumulation periods	Infant mortality rate in counties during other periods	Infant mortality rate in the remaining counties
Annual mean	1.8571%	2.0477%	1.5520%***	1.8248%****
Annual median	1.2658%	2.0270%	1.1881%***	0.5952%****

Panel C. Comparison of low birthweight rates

	Low birthweight rate in all counties	Low birthweight rate in counties during pollutant-accumulation periods	Low birthweight rate in counties during other periods	Low birthweight rate in the remaining counties
Annual mean	7.9607%	9.2372%	7.9821%***	7.5429%***
Annual median	8.4279%	10.4790%	8.3985%***	7.2315%***

Table IA3. Comparisons of sample firms with full Compustat and Execucomp universe

Columns (1) to (3) report summary statistics for our sample firms. Columns (4) to (6) report summary statistics for the Compustat firms. Columns (7) to (9) report similar statistics for the Execucomp firms. Tests of differences in means (medians) are two-sample t-tests (Kruskal-Wallis H-tests). ∗∗∗, ∗∗, and ∗ denote significant differences at the 1%, 5%, and 10% level, respectively.

	All sample CEOs			Compustat universe			Execucomp universe			*t*-stat Sample vs. Compustat	*t*-stat Sample vs. Execucomp
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.		
Size											
Ln(Assets)	19,488	8.1273	1.9171	240,935	5.1418	2.9240	52,659	7.4037	1.8921	199.44***	45.17***
Ln(Sales)	19,453	7.6998	1.7207	222,449	4.7316	2.8293	52,488	6.9762	1.7641	216.37***	49.76***
Performance											
ROA	19,517	0.0415	0.0632	258,354	-0.1354	0.3884	52,970	0.0375	0.0699	210.45***	7.19***
Tobin's Q	18,378	1.7587	0.9384	226,134	2.2736	2.2489	51,778	1.8360	1.0275	-61.42***	-9.36***
Stock return	17,460	0.2290	0.7611	169,216	0.1397	0.8715	47,069	0.1827	0.6595	14.54***	7.11***
Growth opportunities											
PP&E/Assets	19,172	0.2894	0.2455	236,969	0.2662	0.2761	51,721	0.2587	0.2413	12.50***	14.86***
Capex	18,543	0.0554	0.0588	227,049	0.0660	0.9094	50,797	0.0524	0.0605	-5.42***	5.87***
R&D	19,488	0.0239	0.0881	240,935	0.1266	6.1920	52,659	0.0313	0.1191	-8.14***	-9.10***
Debt risk											
Leverage	19,453	0.2120	0.2015	259,370	0.3233	10.4563	52,836	0.2042	0.2152	-5.41***	4.53***
Cash/Assets	19,518	0.1219	0.1526	259,765	0.1907	0.2444	52,994	0.1427	0.1712	-57.67***	-15.78***
Credit rating	13,027	16.1893	3.5057	71,655	14.2963	4.0439	26,915	15.3060	3.4898	55.31***	23.64***
Default probability	15,208	0.1061	0.2364	116,183	0.8458	1.6611	41,477	0.1058	0.2244	-141.25***	0.16
Interest expense/Debt	17,575	0.1978	4.6365	204,864	0.5691	19.6879	45,502	0.4044	14.2940	-6.65***	-2.73***
Equity risk											
Dividend (0,1)	19,482	0.6826	0.4655	241,131	0.4199	0.4936	52,642	0.5845	0.4928	75.41***	24.72***
Ln(1+Share repurchase)	17,790	2.5869	2.7171	238,966	0.6583	1.5598	49,239	2.0398	2.4197	93.53***	23.68***
$\sigma_{\text{Stock return}}$	16,849	0.3902	0.1658	198,603	0.5733	0.4609	48,952	0.4385	0.2401	-111.42***	-28.84***
$\sigma_{\text{Specific return}}$	15,677	0.3046	0.1544	169,765	0.4275	0.3729	45,156	0.3484	0.2330	-80.37***	-26.51***
Other risk											
Acquisition (0,1)	19,573	0.3387	0.4733	310,598	0.1193	0.3241	53,398	0.2828	0.4504	63.94***	14.34***

Table IA4. Effects of CEOs' prenatal Superfund exposure on corporate debt aggressiveness
This table reports coefficients from censored Tobit (column 1) and OLS (column 2) regressions of *kink* as a measure of the aggressiveness of debt policy for fiscal year *t* on our CEOs' prenatal Superfund exposure measure and control variables (of lagged firms, lagged CEOs, and counties characteristics) with fixed effects. In the Tobit model, observations are left-censored at 0 and right-censored at 8. Variables are defined in Appendix A. Constant terms are not reported. *t*-values are based on robust standard errors clustered by CEO-firm and year (two-way) in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent variable	**Kink (Tobit)**	**Kink (OLS)**
	(1)	**(2)**
Ln(1+ CEO #Superfund exposure$_t$)	-0.7161***	-1.1758***
	(-30.78)	(-4.90)
Dividend (0,1)$_t$	0.0738***	-0.0573
	(2.98)	(-0.57)
NOL carryforward (0,1)$_t$	-0.3936***	-0.6161***
	(-21.47)	(-8.76)
ECOST$_t$	-5.2221***	-4.4243
	(-7.76)	(-1.37)
CYCLICAL$_t$	0.0080***	0.0049
	(7.18)	(1.14)
ROA$_t$	17.7599***	6.8840***
	(136.52)	(7.73)
Ln(Sales)$_t$	0.3185***	0.3732***
	(146.55)	(3.95)
Z-score$_t$	2.2349***	0.6204***
	(296.88)	(3.05)
Quick ratio$_t$	0.5214***	0.3329***
	(45.37)	(2.83)
Current ratio$_t$	-0.5843***	-0.3704***
	(-65.89)	(-3.47)
PP&E/Assets$_t$	-0.8684***	-0.8862**
	(-29.47)	(-2.01)
Tobin's Q$_t$	1.0894***	0.2295***
	(96.16)	(5.38)
R&D/Sales$_t$	-4.7964***	0.5934**
	(-16.03)	(2.03)
AD/Sales$_t$	0.3164	-3.8864**
	(1.04)	(-2.08)
Computer industry (0,1)	0.2779***	-0.4894
	(2.80)	(-0.33)
Semiconductor industry (0,1)	14.8542***	3.3349**
	(154.66)	(2.01)
Chemicals industry (0,1)	3.3040***	0.1949
	(85.24)	(0.10)
Aircraft industry (0,1)	2.8714***	0.6179
	(49.92)	(0.36)
Other Sensitive industry (0,1)	3.5062***	1.2026
	(125.15)	(0.72)
Ln(CEO age)$_{t-1}$	-10.4142***	-7.4851**
	(-2258.43)	(-2.53)

Ln(1+CEO tenure)$_{t-1}$	0.4554***	0.2591***
	(56.96)	(3.37)
CEO duality (0,1)$_{t-1}$	-0.3341***	-0.2591***
	(-19.12)	(-2.78)
Founder CEO (0,1)$_{t-1}$	0.1540***	0.3856
	(4.74)	(1.45)
CEO ownership$_{t-1}$ (%)	-0.0145***	-0.0084*
	(-11.38)	(-1.77)
Inst. ownership$_{t-1}$ (%)	1.1209***	0.9066***
	(42.94)	(3.83)
County poverty status	-0.0458***	0.0307
	(-76.21)	(1.49)
County employment status	0.0249***	-0.0192***
	(54.61)	(-2.71)
Ln(County earnings per capita)	-0.4963***	-0.4951*
	(-196.15)	(-1.81)
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes
Adj R^2	0.4386	0.7842
Observations	8,740	8,740

Table IA5. Effects of CEOs' prenatal Superfund exposure on corporate credit risk and default risk

This table reports coefficients from ordered probit and OLS regressions of *Credit rating*, *Junk rating*, *Bankruptcy score*, and *Default probability* for fiscal year *t* on our CEOs' prenatal Superfund exposure measure and control variables (of lagged firms, lagged CEOs, and counties characteristics) with fixed effects. Our control variables are similar to those reported in the leverage regression in Table 2. Variables are defined in Appendix A. Constant terms are not reported. *t*-values are based on robust standard errors clustered by CEO-firm and year (two-way) and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent variable	**Credit rating**	**Junk rating (0,1)**	**Bankruptcy score**	**Default probability**
	Ordered probit	**OLS**	**OLS**	**OLS**
	(1)	**(2)**	**(3)**	**(4)**
Ln(1+CEO #Superfund exposure$_t$)	-0.9963**	0.0907	0.2731**	0.1029***
	(-2.52)	(1.55)	(1.99)	(3.22)
Assets volatility$_{t-1}$	0.6664*	-0.1078*	0.3172**	-0.2057***
	(1.77)	(-1.83)	(2.09)	(-5.44)
Tobin's Q$_{t-1}$	0.0396	-0.0080	0.0182*	0.0024
	(0.89)	(-1.47)	(1.66)	(0.93)
Ln(Assets)$_{t-1}$	0.8908***	-0.1000***	0.0915***	0.0317***
	(10.41)	(-6.26)	(2.59)	(3.92)
Capex$_{t-1}$	5.3197***	-0.6127***	0.7059**	-0.0667
	(7.24)	(-4.27)	(2.23)	(-0.85)
R&D$_{t-1}$	14.0291***	-1.1331***	-1.2359*	-0.1693
	(5.72)	(-3.26)	(-1.85)	(-1.47)
Dividend (0,1)$_{t-1}$	0.8038***	-0.0808***	-0.0112	-0.0127
	(7.66)	(-3.87)	(-0.24)	(-1.10)
ROA$_{t-1}$	2.6272***	-0.2616**	-0.2735*	-0.2245***
	(2.79)	(-2.23)	(-1.83)	(-3.83)
PP&E/Assets$_{t-1}$	1.1642***	-0.0858	0.0134	0.0441
	(2.90)	(-1.16)	(0.06)	(0.86)
Growth in sales$_{t-1}$	-0.2346**	0.0330*	-0.1671*	-0.0169**
	(-2.08)	(1.95)	(-1.84)	(-2.13)
Ln(CEO age)$_{t-1}$	9.7135**	-2.2709***	-0.3365	-0.6523**
	(2.41)	(-3.44)	(-0.26)	(-2.14)
Ln(1+CEO tenure)$_{t-1}$	0.1396	-0.0100	0.0185	0.0134
	(1.23)	(-0.48)	(0.47)	(1.55)
CEO duality (0,1)$_{t-1}$	-0.0404	-0.0246	0.0983**	0.0109
	(-0.43)	(-1.32)	(2.07)	(1.00)
Founder CEO (0,1)$_{t-1}$	-0.2701	0.0810	-0.4741***	0.0447*
	(-0.97)	(0.97)	(-3.04)	(1.73)
CEO ownership$_{t-1}$ (%)	-0.0108*	0.0006	0.0042	0.0012**
	(-1.70)	(0.67)	(1.44)	(2.07)
Inst. ownership$_{t-1}$ (%)	0.2388	-0.0681	0.1481	-0.1433***
	(0.97)	(-1.60)	(1.25)	(-4.99)
County poverty status	0.0718**	-0.0090**	-0.0112	-0.0007
	(2.49)	(-2.20)	(-0.97)	(-0.27)
County employment	0.0157	0.0002	0.0097**	0.0025***
	(1.51)	(0.12)	(2.53)	(2.97)
Ln(County earnings per capita)	-2.1558***	0.0667	-0.0141	0.0314
	(-4.51)	(1.01)	(-0.09)	(1.02)
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes
Clustered by CEO-firm and year	Yes	Yes	Yes	Yes
Pseudo/Adj R^2	0.5321	0.8471	0.7478	0.5677
Observations	5,630	5,630	8,962	8,174

Table IA6. Effects of CEOs' prenatal Superfund exposures on the likelihood of working in Fortune's list of America's Most Admired Companies (MAC)

This table reports coefficients from probit and OLS regressions of the likelihood of working in Fortune's list of America's Most Admired Companies (MAC) for fiscal year *t* on our CEOs' prenatal Superfund exposure measure and control variables (of lagged firms, lagged CEOs, and counties characteristics) with fixed effects. MAC is a dummy variable that equals one indicating a top 50 in Fortune's "America's Most Admired Companies" list and zero otherwise. MAC score is the score (total score is ten) of the top 50 in Fortune's "America's Most Admired Companies" ranking. It is computed based on the average of the attribute scores and zero for the rest of the sample firms. Variables are defined in Appendix A. Constant terms are not reported. *t*-values are based on robust standard errors clustered by CEO-firm and year (two-way) and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent variable	**Probit MAC (0,1)**	**OLS MAC (0,1)**	**OLS Ln(1+MAC score)**
Ln(1+CEO #Superfund exposure$_t$)	4.6209***	0.0130**	0.0188*
	(4.35)	(2.25)	(1.86)
Stock return$_{t-1}$	-0.3802**	-0.0053***	-0.0105***
	(-1.98)	(-3.13)	(-3.29)
ROA$_{t-1}$	12.4151***	-0.0051	-0.0132
	(4.70)	(-0.56)	(-0.83)
Ln(Sales)$_{t-1}$	1.7333***	0.0115***	0.0221***
	(3.60)	(4.39)	(4.59)
Growth in sales$_{t-1}$	-1.5093***	0.0001	0.0002
	(-2.77)	(0.06)	(0.09)
Ln(Mktcap)$_{t-1}$	1.7940***	0.0254***	0.0494***
	(5.04)	(8.31)	(9.07)
Ln(Assets)$_{t-1}$	0.4229	0.0051	0.0023
	(1.01)	(1.48)	(0.39)
Ln(Firm age)$_{t-1}$	3.1485***	0.0127***	0.0209***
	(5.51)	(5.15)	(4.77)
Tobin's Q$_{t-1}$	0.2690*	0.0033	0.0070
	(1.72)	(1.34)	(1.62)
Ln(CEO age)$_{t-1}$	-5.5421	-0.4345***	-0.8417***
	(-0.45)	(-3.12)	(-3.25)
Founder CEO (0,1)$_{t-1}$	0.0014	0.0354***	0.0604***
	(0.00)	(6.67)	(6.13)
CEO duality (0,1)$_{t-1}$	0.2383	-0.0068*	-0.0149**
	(0.48)	(-1.81)	(-2.16)
County poverty status	0.2023**	0.0000	0.0011
	(2.07)	(0.01)	(0.95)
County employment status	0.0870***	0.0001	0.0000
	(5.68)	(0.46)	(0.10)
Ln(County earnings per capita)	1.2911	0.0070	0.0040
	(0.71)	(1.29)	(0.44)
Industry, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes
Clustered by CEO-firm and year	Yes	Yes	Yes
Pseudo R^2/Adj R^2	0.8298	0.4260	0.4355
Observations	3,860	13,903	13,903

Table IA7. Robustness test: Hazard analysis on the effect of Superfund CEOs on other firm consequences

The table reports hazard ratios from Cox proportional hazards (PH) models on the hazard of announced (model 1) and completed takeovers (model 2), as well as the hazard of delisting (model 3). We define "failure" (the occurrence of the examined hazard) as one when the firm receives a takeover announcement, completes a takeover, or is delisted from the stock exchange due to takeovers, liquidations, bankruptcy, or financial reasons during the CEO's tenure and zero otherwise. Duration is the time to the failure event, measured as the number of years from becoming CEO to the event or right-censoring without an event during the sample period. A coefficient or hazard ratio greater (less) than one implies a greater (smaller) risk. *Block* is a dummy variable that equals one if (at least) one institutional investor holds more than 5% of the company's stock and zero otherwise. *Industry peer events* is the natural log of one plus the number of announced (model 1), completed (model 2) takeovers, or of delisting events (model 3) in the firm's industry (based on the Fama-French 48-industry classifications) in the prior year. *Share turnover* is the average daily turnover of the stock. The rest of the variables are defined in Appendix A. All models include year, industry, and firm state headquarter fixed effects. Z-values are reported in parentheses and are based on robust standard errors clustered by industry and year (two-way). *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent variable	**Takeover announcements**	**Completed takeovers**	**Firm delisted**
	(1)	**(2)**	**(3)**
Ln(1+ CEO #Superfund exposure)	1.6107***	1.7155***	1.6651***
	(3.08)	(4.87)	(4.69)
PP&E/Assets	1.0047	0.6720	0.7202
	(0.01)	(-0.93)	(-0.77)
Tobin's Q	0.9042*	0.9538	0.9596
	(-1.74)	(-1.07)	(-0.96)
Cash/Assets	0.5240	0.5530	0.5287
	(-1.16)	(-1.37)	(-1.48)
Block (0,1)	2.0858***	2.1848***	1.9591***
	(3.43)	(4.83)	(4.33)
Ln(Mktcap)	0.8928**	0.8825***	0.8673***
	(-2.28)	(-3.25)	(-3.72)
Industry peer events	2.3774***	2.0410***	1.9297***
	(7.47)	(7.50)	(7.33)
Leverage	1.2776	1.7330	1.3726
	(0.56)	(1.52)	(0.87)
ROA	0.7969	0.5775	0.5051
	(-0.24)	(-0.89)	(-1.17)
Capex	0.0274**	0.1124*	0.0440**
	(-2.08)	(-1.75)	(-2.43)
Share turnover($\times 10^6$)	1.0000	1.0000	1.0000
	(1.11)	(0.67)	(0.73)
Ln(Firm age)	0.7095***	0.7467***	0.7355***
	(-3.00)	(-3.22)	(-3.46)
Stock return	1.0871	1.1588	1.1549
	(0.58)	(1.59)	(1.58)
Dividend yield	1.7105	0.1991	0.0720
	(0.27)	(-0.53)	(-0.85)
Firm ROA volatility	2.4142	2.3979	2.6504*
	(1.27)	(1.63)	(1.83)
log-likelihood	-1797.4107	-2889.4243	-2936.5655
Observations	2,221	2,227	2,227

Table IA8. Robustness test: Difference-in-differences (DID) analysis on CEOs' sudden deaths

This table repeats tests in Tables 2 to 7 and IA4 to IA5 using DID analysis on CEOs' sudden deaths. We contrast the firm-year observations for the three years before and the three years after the CEO demise using *Post CEO demise* (0,1) on the treatment of deceased CEOs' prenatal Superfund exposures (i.e., *Ln*(1+*deceased CEO #Superfund exposure*)). In each column, we include the same fixed effects as in the corresponding previous tables. *t*-values are based on robust standard errors clustered by CEO-firm and by year (two-way) and are reported in parentheses. Variables are defined in Appendix A. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Corresponding table	**2**	**2**	**2**	**IA4**
Dependent variable	**Cash/Assets**	**Leverage**	**Ln(1+Share repurchase)**	**Kink**
	(1)	**(2)**	**(3)**	**(4)**
Post CEO demise $(0,1)_t$ × Ln(1+ deceased CEO #Superfund $exposure_t$)	0.7155**	-1.5846***	2.3378	3.5273***
	(1.96)	(-4.05)	(0.29)	(2.91)
CEO-firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes
Adj R^2/Pseudo R^2	0.9421	0.9780	0.8879	0.2753
Observations	206	205	205	225

Corresponding table	**IA5**	**IA5**	**IA5**	**IA5**	**3**	**3**	**3**
Dependent variable	**Credit rating Ordered probit**	**Junk rating (0,1) OLS**	**Bankruptcy score OLS**	**Default probability OLS**	**Interest expense/Debt**	**Bank loan all-in-spread**	**Bond issue spread**
	(5)	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**
Post CEO demise $(0,1)_t$ × Ln(1+ deceased CEO #Superfund $exposure_t$)	397.5393***	-1.2334***	-1.8951**	-0.0448*	-0.0334*	-448.4504***	-649.7348***
	(11.33)	(-3.71)	(-2.05)	(-1.84)	(-1.68)	(-4.88)	(-17.05)
CEO-firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead lender FE	-	-	-	-	No	Yes	No
Adj R^2/Pseudo R^2	0.8334	0.9201	0.7931	0.7611	0.8821	0.9792	0.8724
Observations	105	105	170	164	164	114	94

Table IA8, continued

Corresponding table	**4**	**4**	**4**	**4**	**4**
Dependent variable	**$\sigma_{\text{Stock return}}$**	**$\sigma_{\text{Specific return}}$**	**Negative skewness**	**$\sigma_{\text{Down-to-up}}$**	**Crash risk**
	(12)	**(13)**	**(14)**	**(15)**	**(16)**
Post CEO demise $(0,1)_t$ × Ln(1+deceased CEO #Superfund exposure$_t$)	-0.2394**	-0.3109***	-2.3685*	-0.6099**	-1.6384***
	(-2.05)	(-2.87)	(-1.83)	(-2.51)	(-2.74)
CEO-firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.8074	0.8414	0.6320	0.6200	0.6372
Observations	187	187	184	165	165

Corresponding table	**5**	**5**	**5**	**6**	**6**	**6**
Dependent variable	**CAR(-1,1) Market model**	**CAR(-1,1) FF4 model**	**Unrelated acquisition (0,1)**	**Ind. adj. ROA**	**Ind. adj. Tobin's Q**	**Ind. adj. Stock return**
	(17)	**(18)**	**(19)**	**(20)**	**(21)**	**(22)**
Post CEO demise $(0,1)_t$ × Ln(1+deceased CEO #Superfund exposure$_t$)	-0.0677*	-0.0479	-1.2753***	0.3284***	2.3568***	1.7643**
	(-1.72)	(-0.95)	(-7.46)	(7.85)	(2.75)	(2.48)
(Acquirer) firm, Year, Birth Year, Birth County, and (Acquirer) HQ State FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2/Pseudo R^2	0.4354	0.4304	0.2927	0.8094	0.9185	0.3655
Observations	113	113	44	274	269	274

	7
	Ln(1+CEO tenure)
	(23)
Post CEO demise $(0,1)_t$ × Ln(1+deceased CEO #Superfund exposure$_t$)	-0.6532**
	(-2.41)
Industry, Year, Birth Year, Birth County, and HQ State FE	Yes
Adj R^2	0.9895
Observations	274

Table IA9. Robustness test: Effect of CEOs' prenatal exposures on their overconfidence

This table reports coefficients from probit and OLS regressions on CEO overconfidence measured by *Holder 67*. Following Malmendier and Tate (2005), *Holder 67* is a dummy variable that equals one if CEOs fail to exercise their executive stock options after the stock price exceeds the option exercise price by more than 67% at least twice during the sample period. *t*-values are based on robust standard errors clustered by CEO-firm and year (two-way) and are reported in parentheses. Variables are defined in Appendix A. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent variable	**Holder 67 (0,1)**	**Holder 67 (0,1)**	**Holder 67 (0,1)**	**Holder 67 (0,1)**
	Probit	**Probit**	**OLS**	**OLS**
Ln(1+CEO #Superfund exposure$_t$)	-0.1343*	-5.4782***	-0.0319*	0.0190
	(-1.88)	(-2.99)	(-1.77)	(0.41)
Ln(Sales)$_t$	0.0621***	0.7639***	0.0177***	0.0293***
	(3.68)	(4.26)	(3.98)	(2.97)
Leverage$_t$	-0.1005	-0.8082	-0.0073	-0.0040
	(-0.63)	(-1.31)	(-0.18)	(-0.09)
Tobin's Q$_t$	0.0622***	0.0090	0.0188***	0.0157***
	(3.04)	(0.14)	(3.56)	(3.12)
Growth in sales$_t$	-0.0234	-0.0251	-0.0032	-0.0024
	(-0.48)	(-0.65)	(-0.74)	(-0.89)
CEO Salarycomp$_t$	-0.6666***	-1.2817***	-0.1550***	-0.0787***
	(-5.79)	(-4.46)	(-5.88)	(-3.79)
Ln(CEO age)$_t$	4.1479**	8.6800	0.5747	1.9415***
	(2.25)	(0.89)	(1.36)	(4.03)
Ln(1+CEO tenure)$_t$	0.7994***	3.2039***	0.1926***	0.1856***
	(25.33)	(15.56)	(26.62)	(16.25)
PP&E/Assets$_t$	0.2790*	0.8218	0.0737**	0.0253
	(1.93)	(0.96)	(2.00)	(0.41)
Cash/Assets$_t$	-1.0621***	-3.7497***	-0.2431***	-0.1277***
	(-6.33)	(-5.24)	(-5.70)	(-2.66)
Dividend (0,1)$_t$	0.0922*	-0.0837	0.0156	-0.0015
	(1.84)	(-0.33)	(1.21)	(-0.11)
NOL carryforward (0,1)$_t$	0.1245***	-0.9777***	0.0249**	-0.0070
	(2.83)	(-6.09)	(2.21)	(-0.63)
ROA$_t$	-0.4600***	0.8056	-0.1050***	-0.0624**
	(-2.67)	(1.36)	(-2.63)	(-2.26)
Bankruptcy score$_t$	-0.0801***	-0.1146*	-0.0169***	-0.0179***
	(-3.10)	(-1.83)	(-2.78)	(-3.39)
Stock return$_t$	-0.0439	-0.1362**	-0.0110*	-0.0161***
	(-1.45)	(-2.16)	(-1.73)	(-2.86)
Stock return$_{t-1}$	0.0294	-0.0517	0.0059	0.0021
	(1.25)	(-0.96)	(0.97)	(0.45)
County poverty status	0.0160**	0.5246	0.0026	0.0159***
	(2.21)	(1.37)	(1.55)	(4.33)
County employment status	0.0119***	0.0604*	0.0025***	0.0042**
	(3.63)	(1.85)	(3.64)	(2.50)
Ln(County earnings per capita)	0.4924***	3.8360	0.0654***	0.0903**
	(4.95)	(0.77)	(3.51)	(2.23)
Industry, Year, Birth Year, Birth County, and HQ State FE	Yes	No	Yes	No
Firm, Year, Birth Year, Birth County, and HQ State FE	No	Yes	No	Yes
Clustered by CEO-firm and year	Yes	Yes	Yes	Yes
Pseudo R^2/Adj R^2	0.3172	0.8448	0.4444	0.7706
Observations	8,752	5,204	10,877	11,179

Table IA10. Robustness test: Effect of CEOs' prenatal exposures to developmental toxic chemicals

This table repeats tests in Tables 2 to 7 and IA4 to IA5, focusing on CEOs' prenatal exposure to developmental toxic chemicals. Here, we regress our models on *Developmental toxic chemical* (0,1), which identifies whether the contaminant the CEO was exposed to is a developmental toxic substance. Each observation corresponds to one CASRN chemical released by the Superfund sites. In each case, we control for the same control variables as in the corresponding previous tables and add chemical fixed effects. *t*-values are based on robust standard errors clustered by CEO-firm and year (two-way) and are reported in parentheses. Variables are defined in Appendix A. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Corresponding table	**2**	**2**	**2**	**IA4**
Dependent variable	**Cash/Assets**	**Leverage**	**Ln(1+Share repurchase)**	**Kink**
	(1)	**(2)**	**(3)**	**(4)**
Developmental toxic chemical $(0,1)_t$	-0.0028***	-0.0061***	0.0998***	-0.0270
	(-3.26)	(-5.03)	(5.40)	(-0.90)
Chemical, Industry, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes
Adj R^2	0.7753	0.6030	0.5792	0.3372
Observations	299,148	326,240	332,184	310,401

Corresponding table	**IA5**	**IA5**	**IA5**	**IA5**	**3**	**3**	**3**
Dependent variable	**Credit rating Ordered probit**	**Junk rating (0,1) OLS**	**Bankruptcy score OLS**	**Default probability OLS**	**Interest expense/Debt**	**Bank loan all-in-spread**	**Bond issue spread**
	(5)	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**
Developmental toxic chemical $(0,1)_t$	-0.0489***	0.0038	0.0448***	0.0065***	0.1492***	2.2208***	7.6080***
	(-9.82)	(1.46)	(2.65)	(4.37)	(4.75)	(3.60)	(4.74)
Chemical, Industry, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead lender FE	-	-	-	-	No	Yes	No
Adj R^2/Pseudo R^2	0.6093	0.6786	0.4614	0.4615	0.0895	0.8096	0.6932
Observations	218,591	218,591	326,730	293,698	286,064	518,689	216,585

Table IA10, continued

Corresponding table	**4**	**4**	**4**	**4**	**4**
Dependent variable	**$\sigma_{\text{Stock return}}$**	**$\sigma_{\text{Specific return}}$**	**Negative skewness**	**$\sigma_{\text{Down-to-up}}$**	**Crash risk**
	(12)	**(13)**	**(14)**	**(15)**	**(16)**
Developmental toxic chemical $(0,1)_t$	0.0046***	0.0055***	0.0628***	0.0098***	0.0222***
	(5.56)	(7.35)	(7.54)	(5.54)	(4.94)
Chemical, Industry, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.7266	0.6374	0.1592	0.1577	0.1324
Observations	303,534	281,334	285,623	285,623	285,677
Corresponding table	**5**	**5**	**5**	**6**	**6**	**6**
Dependent variable	**CAR(-1,1) Market model**	**CAR(-1,1) FF4 model**	**Unrelated acquisition (0,1)**	**ROA**	**Tobin's Q**	**Stock return**
	(17)	**(18)**	**(19)**	**(20)**	**(21)**	**(22)**
Developmental toxic chemical $(0,1)_t$	-0.0004*	-0.0002	0.0708***	-0.0075***	-0.0530***	-0.0182***
	(-1.79)	(-0.81)	(5081)	(-5.77)	(-8.29)	(-5.40)
Chemical, (Acquirer) Industry, Year, (or Industry × Year), Birth Year, Birth County, and (Acquirer) HQ State FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2/Pseudo R^2	0.2004	0.1879	0.3647	0.5150	0.7901	0.4870
Observations	323,404	323,404	308,017	392,408	388,115	392,185
Corresponding table	**7**	**7**
Dependent variable	**Ln(1+CEO tenure)**	**Forced CEO turnover (0,1)**
	(23)	**(24)**
Developmental toxic chemical $(0,1)_t$	-0.0303***	0.1462***
	(-8.27)	(7.47)
Chemical, Industry, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes
Adj R^2/Pseudo R^2	0.6987	0.5147
Observations	479,435	353,606

Table IA11. Robustness test: Effect of Superfund CEOs' postnatal pollution exposure

This table repeats tests in Tables 2 to 7 and IA4 to IA5, focusing on the non-moving Superfund CEOs' likely postnatal exposure to pollution up to adolescence. Non-moving Superfund CEOs are Superfund CEOs born and went to high school in the same county or college in the same state. In each case, we control for the same control variables as in the corresponding previous tables. *t*-values are based on robust standard errors clustered by CEO-firm and year (two-way) and are reported in parentheses. Variables are defined in Appendix A. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Corresponding table	**2**	**2**	**2**	**IA4**
Dependent variable	**Cash/Assets**	**Leverage**	**Ln(1+Share repurchase)**	**Kink**
	(1)	**(2)**	**(3)**	**(4)**
Ln(Length of CEO postnatal exposure)	0.6439	3.9679***	1.9184	0.3394
	(1.11)	(5.07)	(0.13)	(0.00)
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes
Adj R^2	0.8874	0.8290	0.7311	0.7819
Observations	2,054	2,231	2,275	2,161

Corresponding table	**IA5**	**IA5**	**IA5**	**IA5**	**3**	**3**	**3**
Dependent variable	**Credit rating Ordered probit**	**Junk rating (0,1) OLS**	**Bankruptcy score OLS**	**Default probability OLS**	**Interest expense/Debt**	**Bank loan all-in-spread**	**Bond issue spread**
	(5)	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**
Ln(Length of CEO postnatal exposure)	-0.2496***	0.1052**	13.2074**	-5.0409***	44.6186	302.6094**	-24105.39***
	(-2.68)	(2.14)	(2.03)	(-3.30)	(1.08)	(2.23)	(-2.91)
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead lender FE	-	-	-	-	No	Yes	No
Adj R^2/Pseudo R^2	0.5451	0.6992	0.7423	0.6136	0.2006	0.8374	0.7417
Observations	1,531	1,531	2,137	1,978	1,927	3,359	1,806

Table IA11, continued

Corresponding table	**4**	**4**	**4**	**4**	**4**
Dependent variable	**$\sigma_{Stock\ return}$**	**$\sigma_{Specific\ return}$**	**Negative skewness**	**$\sigma_{Down\text{-}to\text{-}up}$**	**Crash risk**
	(12)	**(13)**	**(14)**	**(15)**	**(16)**
Ln(Length of CEO postnatal exposure)	-1.5987***	-1.1264	48.8684***	10.3128***	-10.4635***
	(-3.25)	(-0.84)	(2.88)	(3.03)	(-2.63)
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.8722	0.7691	0.2338	0.2379	0.2360
Observations	2,080	1,928	1,932	1,932	2,001

Corresponding table	**5**	**5**	**5**	**6**	**6**	**6**
Dependent variable	**CAR(-1,1) Market model**	**CAR(-1,1) FF4 model**	**Unrelated acquisition (0,1)**	**ROA**	**Tobin's Q**	**Stock return**
	(17)	**(18)**	**(19)**	**(20)**	**(21)**	**(22)**
Ln(Length of CEO postnatal exposure)	0.0080	0.0041	-0.0568	-0.0062	-0.1047**	0.0465
	(0.81)	(0.40)	(-0.67)	(-0.72)	(-2.50)	(0.98)
(Acquirer) industry, Year, (or Industry × Year), Birth Year, Birth County, and (Acquirer) HQ State FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.2653	0.2740	0.5094	0.5725	0.8467	0.5132
Observations	1,691	1,691	1,691	2,677	2,648	2,676

Corresponding table	**7**	**7**
Dependent variable	**Ln(1+CEO tenure)**	**Forced CEO turnover (0,1)**
	(23)	**(24)**
Ln(Length of CEO postnatal exposure)	0.0385	0.8409**
	(0.85)	(1.96)
Industry, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes
Pseudo R^2/Adj R^2	0.7268	0.6460
Observations	2,815	1,629

Table IA12. Robustness test: CEOs' current exposure to pollutants at the workplace

This table repeats tests in Tables 2 to 7 and IA4 to IA5 with three additional variables to control for firms' different relationships with pollution. *Firm current polluter?* (0,1) identifies whether the firm is a polluter listed on EPA's databases. *HQ current pollution exposure* (0,1) and *Facility current pollution exposure* (0,1) capture whether the firm's headquarters and its facilities are currently exposed to toxic pollutants, respectively. In each column, we include the same control variables and fixed effects as the corresponding previous tables. *t*-values are based on robust standard errors clustered by CEO-firm and by year (two-way) and are reported in parentheses. Variables are defined in Appendix A. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Corresponding table	**2**	**2**	**2**	**IA4**			
Dependent variable	**Cash/Assets**	**Leverage**	**Ln(1+Share repurchase)**	**Kink**			
	(1)	**(2)**	**(3)**	**(4)**			
Ln(1+CEO #Superfund exposure$_t$)	-0.0180	0.0437***	-0.7189**	-0.6574***			
	(-1.56)	(2.82)	(-2.19)	(-28.22)			
Firm current polluter? (0,1)$_t$	-0.0035	0.0124*	-0.3483**	0.0023			
	(-0.50)	(1.68)	(-2.35)	(0.12)			
HQ current pollution exposure (0,1)$_t$	-0.0017	-0.0171***	0.0753	0.2242***			
	(-0.37)	(-3.31)	(0.73)	(12.41)			
Facility current pollution exposure (0,1)$_t$	-0.0052	-0.0105	-0.2528*	-0.0220			
	(-0.82)	(-1.55)	(-1.77)	(-1.16)			
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes			
Adj R^2/Pseudo R^2	0.8553	0.7922	0.6959	0.4387			
Observations	8,298	8,955	9,136	8,740			
Corresponding table	**IA5**	**IA5**	**IA5**	**IA5**	**3**	**3**	**3**
Dependent variable	**Credit rating Ordered probit**	**Junk rating (0,1) OLS**	**Bankruptcy score OLS**	**Default probability OLS**	**Interest expense/Debt**	**Bank loan all-in-spread**	**Bond issue spread**
	(5)	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**
Ln(1+CEO #Superfund exposure$_t$)	-0.9889**	0.0919	0.2737**	0.1045***	0.2922	16.6494**	91.7241***
	(-2.49)	(1.57)	(1.99)	(3.27)	(0.91)	(2.01)	(3.91)
Firm current polluter? (0,1)$_t$	-0.0549	-0.0063	-0.0307	-0.0264	0.0533	9.6089*	53.0752***
	(-0.29)	(-0.22)	(-0.43)	(-1.53)	(0.57)	(1.12)	(2.84)
HQ current pollution exposure (0,1)$_t$	0.0326	-0.0021	-0.0569	0.0086	-0.4473	9.0600**	-22.2886**
	(0.34)	(-0.11)	(-1.16)	(0.80)	(-1.07)	(2.03)	(-1.96)
Facility current pollution exposure (0,1)$_t$	0.0295	-0.0221	0.0027	0.0120	0.0497	-7.6088	-11.5610
	(0.18)	(-0.90)	(0.04)	(0.75)	(0.62)	(-0.77)	(-0.63)
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead lender FE	-	-	-	-	No	Yes	No
Adj R^2/Pseudo R^2	0.5321	0.8471	0.6324	0.5679	0.1305	0.8260	0.7681
Observations	5,630	5,630	8,962	8,174	7,833	11,693	6,273

Table IA12, continued

Corresponding table	**4**	**4**	**4**	**4**	**4**
Dependent variable	**$\sigma_{\text{Stock return}}$**	**$\sigma_{\text{Specific return}}$**	**Negative skewness**	**$\sigma_{\text{Down-to-up}}$**	**Crash risk**
	(12)	**(13)**	**(14)**	**(15)**	**(16)**
Ln(1+CEO #Superfund exposure$_t$)	0.0301**	0.0242	0.3622**	0.0844**	0.1856**
	(2.41)	(1.54)	(2.00)	(2.26)	(2.02)
Firm current polluter? $(0,1)_t$	-0.0024	-0.0014	-0.1392	-0.0297	-0.0563
	(-0.35)	(-0.17)	(-1.60)	(-1.58)	(-1.22)
HQ current pollution exposure $(0,1)_t$	0.0042	-0.0015	0.0462	0.0071	0.0033
	(1.03)	(-0.29)	(0.89)	(0.67)	(0.12)
Facility current pollution exposure $(0,1)_t$	0.0112*	0.0133*	0.0650	0.0285	-0.0176
	(1.77)	(1.76)	(0.77)	(1.62)	(-0.38)
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.8593	0.7485	0.2440	0.2447	0.2293
Observations	8,458	7,795	8,036	8,036	8,037
Corresponding table	**5**	**5**	**5**	**6**	**6**	**6**
Dependent variable	**CAR(-1,1) Market model**	**CAR(-1,1) FF4 model**	**Unrelated acquisition (0,1)**	**ROA**	**Tobin's Q**	**Stock return**
	(17)	**(18)**	**(19)**	**(20)**	**(21)**	**(22)**
Ln(1+CEO #Superfund exposure$_t$)	-0.0082***	-0.0065**	0.2695***	-0.0172***	-0.0993***	-0.0520**
	(-2.67)	(-2.11)	(2.63)	(-3.29)	(-2.90)	(-2.13)
Firm current polluter? $(0,1)_t$	-0.0006	-0.0008	0.0749	0.0095*	0.0479	0.0405
	(-0.16)	(-0.25)	(0.60)	(1.90)	(1.04)	(1.33)
HQ current pollution exposure $(0,1)_t$	0.0002	0.0010	-0.0975	-0.0027	0.0353	0.0146
	(0.09))	(0.43)	(-1.23)	(-0.69)	(1.21)	(0.66)
Facility current pollution exposure $(0,1)_t$	0.0020	0.0020	0.0934	0.0062	-0.0268	-0.0027
	(0.61)	(0.62)	(0.81)	(1.29)	(-0.59)	(-0.09)
(Acquirer) industry, Year (or Industry×Year), Birth Year, Birth County, and (Acquirer) HQ State FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2/Pseudo R^2	0.1670	0.1646	0.3353	0.3547	0.7284	0.3509
Observations	6,799	6,799	6,065	10,433	10,344	10,421

Table IA12, continued

Corresponding table	**7**	**7**
Dependent variable	**Ln(1+CEO tenure)**	**Forced CEO turnover (0,1)**
	(23)	**(24)**
Ln(1+CEO #Superfund exposure$_t$)	-0.0526**	0.2619***
	(-2.47)	(3.06)
Firm current polluter? (0,1)$_t$	0.0333	0.0025
	(0.99)	(0.02)
HQ current pollution exposure (0,1)$_t$	0.0478***	0.1264
	(2.68)	(1.61)
Facility current pollution exposure (0,1)$_t$	-0.0692**	-0.4643***
	(-2.11)	(-3.46)
Industry, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes
Adj R^2/Pseudo R^2	0.6117	0.3473
Observations	10,962	7,637

Table IA13. Robustness test: Superfund CEOs versus Non-Superfund CEOs – Nearest birthplace matching sample

This table repeats tests in Tables 2 to 7 and IA4 to IA5 using the nearest birthplace matching sample. This matching sample comprises CEO-firm-year pairs with Superfund CEOs matched with non-Superfund CEOs. Matched CEO-firm-year pairs satisfy: (1) their CEOs were born in the same year if feasible (or in the same decade, if not), and (2) they are in the same FF48 industry. For those satisfying the above requirements, we choose our control non-Superfund CEO as the one born in the nearest neighboring counties to the Superfund CEO. In each column, we include the same control variables and fixed effects as the corresponding previous tables. *t*-values are based on robust standard errors clustered by CEO-firm and year (two-way) and are reported in parentheses. Variables are defined in Appendix A. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Corresponding table	**2**	**2**	**2**	**IA4**			
Dependent variable	**Cash/Assets**	**Leverage**	**Ln(1+Share repurchase)**	**Kink**			
	(1)	**(2)**	**(3)**	**(4)**			
Ln(1+CEO #Superfund exposure$_t$)	-0.8693***	1.5276***	-5.4005*	-4.3419*			
	(-6.58)	(5.92)	(-1.66)	(-1.74)			
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes			
Adj R^2/Pseudo R^2	0.8935	0.6259	0.5988	0.4625			
Observations	3,720	3,016	3,115	3,851			
Corresponding table	**IA5**	**IA5**	**IA5**	**IA5**	**3**	**3**	**3**
Dependent variable	**Credit rating Ordered probit**	**Junk rating (0,1) OLS**	**Bankruptcy score OLS**	**Default probability OLS**	**Interest expense/Debt**	**Bank loan all-in-spread**	**Bond issue spread**
	(5)	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**
Ln(1+CEO #Superfund exposure$_t$)	-12.3076***	0.8318*	5.9016***	0.0106**	0.2418*	362.3219***	472.2387*
	(-3.45)	(1.76)	(3.03)	(2.36)	(1.72)	(3.61)	(1.91)
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead lender FE	-	-	-	-	No	Yes	No
Adj R^2/Pseudo R^2	0.5635	0.8743	0.6320	0.6107	0.4978	0.8636	0.5047
Observations	2,604	2,604	3,702	3,647	3,455	5,267	2,164

Table IA13, continued

Corresponding table	**4**	**4**	**4**	**4**	**4**
Dependent variable	**$\sigma_{Stock\ return}$**	**$\sigma_{Specific\ return}$**	**Negative skewness**	**$\sigma_{Down\text{-}to\text{-}up}$**	**Crash risk**
	(12)	**(13)**	**(14)**	**(15)**	**(16)**
Ln(1+CEO #Superfund exposure$_t$)	0.1530	0.5284***	4.6745**	0.7517*	2.8189**
	(1.09)	(3.03)	(1.96)	(1.71)	(2.02)
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.8893	0.7867	0.3031	0.3006	0.2876
Observations	3,818	3,528	3,648	3,648	3,649
Corresponding table	**5**	**5**	**5**	**6**	**6**	**6**
Dependent variable	**CAR(-1,1) Market model**	**CAR(-1,1) FF4 model**	**Unrelated acquisition (0,1)**	**ROA**	**Tobin's Q**	**Stock return**
	(17)	**(18)**	**(19)**	**(20)**	**(21)**	**(22)**
Ln(1+CEO #Superfund exposure$_t$)	-0.0193***	-0.0181**	0.7678***	-0.0157	-0.0794	-0.0732
	(-2.73)	(-2.48)	(2.58)	(-1.48)	(-1.20)	(-1.60)
(Acquirer) industry, Year, (or Industry × Year), Birth Year, Birth County, and (Acquirer) HQ State FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2/Pseudo R^2	0.2574	0.2628	0.3825	0.5770	0.7947	0.4890
Observations	2,789	2,789	2,326	4,795	4,735	4,794

Corresponding table	**7**	**7**
Dependent variable	**Ln(1+CEO tenure)**	**Forced CEO turnover (0,1)**
	(23)	**(24)**
Ln(1+CEO #Superfund exposure$_t$)	-0.1532***	1.3110***
	(-4.77)	(4.87)
Industry, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes
Adj R^2/Pseudo R^2	0.6932	0.5179
Observations	5,049	2,943

Table IA14. Robustness test: Superfund CEOs versus Non-Superfund CEOs – Nearest firm headquarters matching sample

This table repeats tests in Tables 2 to 7 and IA4 to IA5 using the nearest firm headquarters matching sample. This matching sample comprises CEO-firm-year pairs with Superfund CEOs matched with non-Superfund CEOs. Matched CEO-firm-year pairs satisfy: (1) their CEOs were born in the same year if feasible (or in the same decade, if not), and (2) they are in the same FF48 industry. For those satisfying the above requirements, we choose the control firm managed by a non-Superfund CEO with headquarter located in the nearest neighboring counties to the treated firm managed by a Superfund CEO. In each column, we include the same control variables and fixed effects as the corresponding previous tables. *t*-values are based on robust standard errors clustered by CEO-firm and year (two-way) and are reported in parentheses. Variables are defined in Appendix A. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Corresponding table	**2**	**2**	**2**	**IA4**
Dependent variable	**Cash/Assets**	**Leverage**	**Ln(1+Share repurchase)**	**Kink**
	(1)	**(2)**	**(3)**	**(4)**
Ln(1+CEO #Superfund exposure$_t$)	-1.0406**	0.7763**	-12.9506***	0.1029***
	(-2.45)	(2.40)	(-2.65)	(2.93)
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes
Adj R^2/Pseudo R^2	0.6227	0.8444	0.4565	0.4703
Observations	3,134	4,322	4,141	4,296

Corresponding table	**IA5**	**IA5**	**IA5**	**IA5**	**3**	**3**	**3**
Dependent variable	**Credit rating Ordered probit**	**Junk rating (0,1) OLS**	**Bankruptcy score OLS**	**Default probability OLS**	**Interest expense/Debt**	**Bank loan all-in-spread**	**Bond issue spread**
	(5)	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**
Ln(1+CEO #Superfund exposure$_t$)	-8.3166***	-0.4487	4.7935**	2.7135***	0.1151**	2286.412*	438.67**
	(-5.93)	(-0.35)	(2.16)	(6.39)	(5.49)	(1.89)	(2.12)
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead lender FE	-	-	-	-	No	Yes	No
Adj R^2/Pseudo R^2	0.1785	0.8743	0.6281	0.5768	0.5131	0.8712	0.7434
Observations	3,504	2,980	4,179	4,023	2,901	4,313	2,630

Table IA14, continued

Corresponding table	**4**	**4**	**4**	**4**	**4**
Dependent variable	**$\sigma_{Stock\ return}$**	**$\sigma_{Specific\ return}$**	**Negative skewness**	**$\sigma_{Down\text{-}to\text{-}up}$**	**Crash risk**
	(12)	**(13)**	**(14)**	**(15)**	**(16)**
Ln(1+CEO #Superfund exposure$_t$)	0.3087	0.3484**	7.4815***	1.0445***	3.1280***
	(1.48)	(2.34)	(4.43)	(2.77)	(2.90)
Firm, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.8735	0.8941	0.3486	0.3364	0.1376
Observations	4,175	4,175	4,010	4,010	4,011
Corresponding table	**5**	**5**	**5**	**6**	**6**	**6**
Dependent variable	**CAR(-1,1) Market model**	**CAR(-1,1) FF4 model**	**Unrelated acquisition (0,1)**	**ROA**	**Tobin's Q**	**Stock return**
	(17)	**(18)**	**(19)**	**(20)**	**(21)**	**(22)**
Ln(1+CEO #Superfund exposure$_t$)	-0.0109*	-0.0212*	2.5571***	-0.0432***	-0.4442***	-0.1766*
	(-1.81)	(-1.67)	(3.21)	(-3.92)	(-3.02)	(-1.93)
(Acquirer) industry, Year, (or Industry × Year), Birth Year, Birth County, and (Acquirer) HQ State FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2/Pseudo R^2	0.3507	0.4357	0.4282	0.5459	0.6052	0.3716
Observations	2,670	2,670	2,080	5,577	5,332	5,435

Corresponding table	**7**	**7**
Dependent variable	**Ln(1+CEO tenure)**	**Forced CEO turnover (0,1)**
	(23)	**(24)**
Ln(1+CEO #Superfund exposure$_t$)	-0.0517	3.5235***
	(-1.07)	(4.58)
Industry, Year, Birth Year, Birth County, and HQ State FE	Yes	Yes
Adj R^2/Pseudo R^2	0.8369	0.7170
Observations	5,726	1,976

Table IA15. Placebo test: Random assignment of the CEO's birthplace

This table repeats tests in Tables 2 to 7 and IA4 to IA5 using randomly assigned CEO's birthplaces for two empirical bootstrap resampling distributions. To construct each empirical distribution, we replace the sample CEOs' birth county (and county-level control variables) with a pseudo-CEO birth county. In column (1), for each firm-CEO in the sample, the pseudo-county is randomly chosen from all U.S. counties (not limited to the CEOs' birthplaces in our sample). The main regressions are run on this pseudo-sample. This process is repeated 1,000 times, forming an empirical bootstrap resampling distribution. In column (2), for each firm-CEO in the sample, the pseudo-county is randomly chosen from the ten nearest counties to the CEO birth county, and the main regressions are run on this pseudo-sample. This process is repeated 100 times, forming the second empirical bootstrap resampling distribution. In both columns, we use *Ln*(1+ *Pseudo-random CEO #Superfund exposure*) to capture the effect of randomly assigning the CEO's prenatal Superfund exposures for the bootstrap resampling distributions. In each column, we include the same control variables and fixed effects as the corresponding previous tables. We report the fraction of the total number of bootstrap regressions that report similar significant (p-value ≤0.05) coefficients *Ln*(1+ *Pseudo-random CEO #Superfund exposure*) as our main tables. Variables are defined in Appendix A. Bolded values signify cases when the pseudo-random procedure results in significant (p-value ≤0.05) coefficients similar to our main results more than 5% of the time.

Dependent variable	Corresponding table	Fraction of significant bootstrapped coefficients	
		Pseudo-random CEO #Superfund exposure (Random assignment of CEO birth county to all counties in the US)	Pseudo-nearest CEO #Superfund exposure (Random assignment of CEO birth county to one of closest 10 counties)
		(1)	(2)
Cash/Assets	2	**0.095**	0.030
Leverage	2	**0.087**	0.000
Ln(1+Share repurchase)	2	**0.097**	0.010
Kink	IA4	0.019	0.000
Credit rating	IA5	**0.130**	**0.250**
Junk rating (0,1)	IA5	**0.062**	0.030
Bankruptcy score	IA5	0.032	0.000
Default probability	IA5	0.018	0.000
Interest expense/Debt	3	0.002	0.000
Bank loan all-in-spread	3	0.047	0.000
Bond issue spread	3	**0.098**	0.000
$\sigma_{\text{Stock return}}$	4	**0.078**	0.010
$\sigma_{\text{Specific return}}$	4	0.036	0.010
Negative skewness	4	0.027	0.020
$\sigma_{\text{Down-to-up}}$	4	0.017	0.010
Crash risk	4	0.016	0.040
CAR(-1,1) Market model	5	0.013	0.000
CAR(-1,1) FF4 model	5	0.011	0.000
Unrelated acquisition (0,1)	5	0.004	0.000
ROA	6	0.033	**0.060**
Tobin's Q	6	0.047	0.040
Stock return	6	0.017	0.000
Ln(1+CEO tenure)	7	**0.097**	**0.120**
Forced CEO turnover (0,1)	7	**0.121**	**0.120**