

Market Perceptions of EPA Actions under Different Political Regimes

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Studies find that the penalty imposed by the market on violators of environmental regulations is a function of the form of legal action taken and type of toxin involved as well as special circumstances such as firm size. In addition to these factors, we hypothesize that the market reacts differently to announced violations in different political environments. This hypothesis stems from the general perception that Democrats are more inclined than Republicans to use rules-based rather than market-based environmental remedies. The hypothesis is tested using an event-study methodology. Regression of cumulative abnormal returns on the dichotomous political party variables produced significant results. Evidence based on the period 1980-2002 suggests that the market responds more negatively to unexpected announcements of environmental infractions under Democratic administrations than under Republican administrations, particularly when Democrats control both the presidency and the Senate.

Introduction

Several recent studies (Jayachandran, 2006; Knight, 2006; Shelton, 2005; and Snowberg, Wolfers, and Zitzewitz, 2006a, 2006b) report partisan effects of presidential elections and changes in congressional majorities on financial market outcomes. For instance, Jayachandran (2006) uses the surprise switch of Senator Jim Jeffords from the Republican Party to Independent to estimate the impact of changes in congressional control on equity values. She finds that firms making large donations to the Republican Party lost market value in the announcement week of the switch. Jayachandran explains the relationship between donations and stock returns

as reflecting how well a party's policy agenda matches a firm's interests and the perceived support of the party in achieving the firm's objectives.

In another study, Knight (2006) tests whether the market capitalized party platforms into the equity values of 70 firms favored under either the Bush or Gore agendas in the 2000 election campaign. Event-study analysis shows that campaign platforms matters in the valuation of politically-sensitive firms. Snowberg, Wolfers, and Zitzewitz (2006a, 2006b) analyze the impact of election outcomes and changes in congressional majorities on three stock price indices (S&P, DJIA, and Nasdaq). They find a Republican-Democrat differential not only in recent elections but also extending back for many decades.

These results suggest that financial markets recognize the intrinsic policy goals of the major political parties and react to changes in political regimes. The purpose of the present paper is to take the analysis one step further by examining the impact of changes in political regimes on the market's reaction to specific agency decisions.¹ The paper focuses on the enforcement activities of the Environmental Protection Agency (EPA).

Previous studies (Jones and Rubin, 2001; Karpoff, Lott, and Rankine, 1998; Muroghalu, Robinson, and Glasscock, 1990) of environmental enforcement actions have found that the market's reaction to announced violations is a function of the form of legal action taken, the type of toxins involved in the citation, and special circumstances such as firm size. The hypothesis tested in this paper is that in addition to these factors, the market reacts differently to announced environmental infractions depending on which political party controls the presidency and/or Congress.² Testing this hypothesis is important because studies that do not recognize the impact of the political environment on agency decisions run the risk of obtaining biased estimates of the other factors in their models. For example, an omitted political regime measure could be correlated with the types of legal action and/or toxin(s) involved in the

¹Empirical evidence (Stigler 1971; Peltzman 1976) indicates that the parties are mindful of the political realities and supply through regulatory agencies the policies demanded by their constituencies. Cooper and West (1988) and Moe (1982) describe several ways the president can influence agency decisions both directly and indirectly. Channels of congressional influence are detailed in Furlong (1998) and Waterman, Wright, and Rouse (1994).

²This hypothesis assumes an underlying difference in the philosophy of environmental management between the two political parties. Democratic regimes are perceived as favoring an aggressive EPA, one that uses a rules-based approach to environmental enforcement. On the other hand, the Republican philosophy is seen as focusing more on a market-based approach with greater emphasis on the excess burden associated with environmental regulations. These perceived philosophical differences underlie the empirical evidence presented in Emerson and North (2005), Herron et al. (1999), Knight (2006), Reilly and Drzycimski (1976), and Riley and Luksetich (1980) as well.

violation. Such an omission could confound a model's interpretation by attributing the impact of political regime changes to other regressors. Thus, the true market effect of an announced environmental violation could be overestimated or underestimated depending on the sign of the coefficient of the excluded regime variable and its correlation to the other determinants. The event-study model specified in this paper endeavors to determine whether announced violations of EPA statutes and rulings elicit different market responses depending on the political regimes in which they occur.

Related Studies

Several studies (Hamilton, 1995; Harper and Adams, 1996; Jones and Rubin, 2001; Karpoff, Lott, and Rankine, 1998; Muoghalu, Robinson, and Glasscock, 1990; Laplante and Lanoie, 1994; and Lanoie, Laplante, and Roy, 1997) have analyzed the direct impact of environmental damage lawsuits and case settlements on shareholder wealth, but few studies have considered the political environment in which this impact occurred. It is important to study this effect because different policy decisions are forthcoming from different intrinsic party platforms. This section summarizes the results of five studies that have recognized the potential influence of political regimes on the behavior of the EPA and places the conclusions of these studies in the context of the present paper.

Emerson and North (2005) study the impact of presidential campaign events during the 1992 and 2000 elections on the stock prices of firms with poor environmental records, so-called dirty firms. They hypothesize that dirty firms should suffer from the announcements of Democratic presidential successes and benefit from reports of Republican advances in the polls. The study encompasses the years 1987-2000. Violators were placed into 15 categories depending on the nature of their infraction. In general, abnormal returns were negative following the announcement of Democratic successes and positive for events favoring Republicans. Emerson and North's results support our contention that the political environment influences abnormal returns. They fail to recognize the full complexity of regime changes, however, i.e., the need to analyze the potential interplay between presidential administrations and the party(ies) in control of Congress.

Daley and Layton (2004) analyze the time to remediation of Superfund sites. They hypothesize that sites located in the districts of legislators on the Superfund oversight committees were likely to be remediated in a shorter time than other sites, all else being equal. A proportional hazard model was used to estimate a site's risk of being classified as "construction complete." Daley and Layton conclude that EPA administrators respond to pressure from legislators who are members of congressional oversight committees. This study provides a basis for hypothesizing

congressional influence on EPA decisions and, consequently, how markets perceive these decisions.

Jones and Rubin (2001) study 98 negative environmental events affecting electric utilities and oil companies over the period 1970-1992. They conjecture that firms involved in negative environmental incidents realize losses in capital value due to an impairment of their social reputation. The hypothesis is tested by regressing cumulative abnormal returns on a series of explanatory factors including dummy variables representing four presidential administrations. None of the presidential regime regressors proves statistically significant. Jones and Rubin did not test for the effects of changes in congressional control on abnormal returns or the potential interaction between presidential administrations and party control of Congress, however.

In another study of presidential administrations, Herron et al. (1999) use data from the 1992 Iowa Electronic Markets to estimate the impact of changes in the standings of presidential candidates on the expected returns of 74 economic-sector portfolios. Changes in a candidate's standings are associated with significant variations in returns for 15 of the 74 portfolios. Disaggregation of the results shows that anti-pollution firms tend to be pro-Clinton and toxic emitters anti-Clinton relative to Bush. Again, only presidential regimes are included in this study.

Mixon (1995) uses environmental and public-choice factors as covariates to estimate the probability that a Standard Metropolitan Statistical Area (SMSA) would be cited by EPA for violations of carbon emissions standards. The study encompasses the years 1988 to 1990 and includes environmental data for 40 SMSAs. One of the regressors in Mixon's model is a dummy variable indicating whether a state was represented by a Republican governor or not. Mixon hypothesizes that a Republican administration in Washington might use the EPA as a way to favor SMSAs in states with Republican governors. Having a Republican governor was unrelated to the number of EPA citations. However, Mixon's results seem ambiguous in the context of our hypothesis because the 1988-1990 period was one of divided government. The Democratic Congress may have limited the administration's ability to reward the governors.

All of the studies discussed above provide a basis for hypothesizing partisan effects on market outcomes. Nevertheless, none of the studies considers the combined effects of presidential administration and congressional control on the market response to publicly announced violations of EPA policies. The present paper uses this broader definition of political regime to construct a model for estimating the impact of EPA announcements on the abnormal returns of the named companies.

Data

Two types of data are used in this study. The first data set consists of information on announced violations of EPA statutes and rulings occurring over the period 1980-2002.³ These prospective events are obtained through a search of the Wall Street Journal (WSJ) Index and microfiche and online (ABI-INFORM) copies of WSJ articles. The WSJ index search categories include environment, environmental issues, environmental policy, environmental cleanup, environmental protection, Environmental Protection Agency, environmental impact, environmental education, environmental justice, environmental law, pollution, toxic substances, waste materials, and all cross-referenced categories. An event date is defined as the day the news about an environmental infraction first appears in the WSJ. The article describing each potential event is read to determine if an actual monetary penalty is included in the announcement. If so, it is included as a definitive event date.⁴ Duplicate announcements of EPA actions are not included in the final data set unless the monetary penalty changed or the action was modified in some significant way, e.g., by a court ruling.

The resulting sample includes 201 environmental infractions. These infractions (events) involve environmental-damage lawsuits, case settlements, regulatory sanctions, and criminal offenses for a diverse group of violators. The sample period encompasses two Democratic⁵ and three Republican presidential administrations and six shifts in the control of either the House or the Senate. The government was unified during the 96th and 103rd sessions and divided in the remainder.

The event intervals are screened for possible contamination from coincidental events. We define coincidental events as major plant closures, suspension of merger talks, new products, stock splits, and similar announcements that could influence a firm's market price irrespective of the announced environmental infraction. The WSJ and Lexis-Nexis databases are used to screen for concurrent events. Potential concurrent events are found for 24 firms. A separate variable is included in the cross-section regressions to test for the impact of these events on abnormal returns.

The second data set consists of information about the companies involved in the environmental incidences. The firm-specific data are created from the information in

³All of the violations involved EPA actions. Announcements of actions by state and foreign governments are excluded from the sample.

⁴The model outlined in the next section makes abnormal returns a function of announced monetary sanctions.

⁵The sample includes observations from the last year of the Carter administration.

the Center for Research in Security Prices (CRSP) and Compustat databases. The abnormal returns are estimated using Eventus 7.0 (Cowan 2002).⁶

Methodology

Past studies (Karpoff et al., 1998; Jones and Rubin, 2001) find that environmental infractions affect abnormal returns primarily through direct costs on firms. These costs include fines, legal fees, and mandatory cleanups. Additional costs due to a loss of reputation have been suggested; however, evidence for their existence is scant. For example, Karpoff et al. (1998) and Jones and Rubin (2001) did not find a reputation effect in their study of environmental incidents.⁷ Thus, while in theory abnormal returns resulting from the announcement of environmental infractions imply the existence of two components, the dominant relationship seems to be between abnormal returns and monetary sanctions. Equation (1.1) expresses abnormal returns as a function of the two components where X_1 represents the expected monetary sanction and X_2 is the unobservable reputation effect. ϕ_j is the cumulative average abnormal return defined in footnote 6 for the $j = j$ th event ($j = 1, 2, \dots, 201$). The approach taken in this paper is to estimate the reduced-form version of equation (1.1) as a function of monetary sanctions. Monetary sanctions depend on the type of legal action, types of toxins, political regime, and other determinants such as firm size. The model was derived by substituting equation (1.2) into equation (1.1). The model estimated in this study is expressed in equation (1.4), where $\pi_{ij} = \lambda\gamma_{ij}$ and ε_j represents the error terms with $\varepsilon_j \sim N(0, \sigma_\varepsilon^2)$.

$$\phi_j = \lambda(X_{1j}, X_{2j}) \quad (1.1)$$

$$X_{1j} = \gamma(L_{ij}, T_{ij}, P_{ij}, O_{ij}) \quad (1.2)$$

$$\phi_j = \lambda\{\gamma(L_{ij}, T_{ij}, P_{ij}, O_{ij}), X_{2j}\} \quad (1.3)$$

⁶Abnormal returns for each security j on day t are estimated according to the following equation:

$$\psi_{jt} = R_{jt} - (\beta_0 + \beta_1 R_{mt})$$

where ψ_{jt} is defined as the abnormal return for security j on day t . R_{jt} is the daily return on security j for day t . ψ_{jt} is distributed with a mean of zero and a standard deviation of σ_j . $E(\psi_{jt}) \neq 0$ when unexpected information affects a company's return without impacting the market's return. R_{mt} is the daily rate of return on the CRSP equally weighted index. β_0 and β_1 are estimated parameters from the market model. The market model is estimated over the interval $t = -246$ to $t = -46$. The estimated coefficients of the market model are used to calculate the abnormal returns. Then the abnormal returns are accumulated to find the ϕ . The cumulative abnormal return (ϕ) from t_1 to t_2 is $\phi_{t_1, t_2} = \sum \psi$.

⁷Karpoff et al. (1998) say that share value losses can be completely attributable to the legal penalties rather than to expectations of lower profits due to the reputation effect.

$$\phi_j = \pi_0 + \pi_1 L_{ij} + \pi_2 T_{ij} + \pi_3 P_{ij} + \pi_4 O_{ij} + \varepsilon_j \quad (1.4)$$

The determinants of abnormal returns fall into four categories. Category one (L) includes dummy variables for the types of legal action taken against the violator(s). The remedies initiated or imposed by the EPA embrace administrative (regulatory) actions, criminal indictments, civil suits, and settlements. Different action could affect market expectations differently given the nature of the penalties. For example, the cost of an announced settlement may be perceived differently from the announcement of a contestable administrative ruling that could involve a lengthy period of litigation.⁸ Therefore, the impact of environmental violations on stockholder wealth may vary depending on the nature of the legal action taken.

The second category (T) consists of binary variables for the types of toxins involved in the violation(s).⁹ Several toxins, including polychlorinated biphenyls (PCBs), radioactive material, dioxin, lead, sulfur dioxide, methylisocyanate (MIC), and asbestos, are named in the legal actions. All of these chemical categories have recognized or suspected health effects such as cancer, developmental toxicity, reproductive toxicity, neurotoxicity, cardiovascular disease, or skin disorders.

Category three (P) is a set of dummy variables representing the presidential administration and party in control of Congress. As discussed in the introduction, the market's reaction to environmental announcements may depend on the contemporaneous political party(ies) controlling the presidency and/or Congress.

Category four (O) includes concurrent news and the log of firm size. Concurrent news includes contemporaneous announcements affecting a company during the event window. Jones and Rubin (2001) and MacKinlay (1997) suggest the inclusion of this dummy variable to recognize the possibility of commingling announcements of environmental violations with other unusual happenings in the event window.¹⁰

⁸For example, Bosch, Eckard, and Lee (1998) find the losses in shareholder wealth of firms that settled with the EPA to be 40 percent less than those that fought and lost. In contrast, there are no wealth gains for those that fought and won.

⁹Seventy-nine events involved what we refer to as primary identifiable toxins. The criterion for inclusion in this category is that the toxins must be clearly causal in the event, i.e., not commingled with other liquids, gases, or chemical compounds. In many cases there is no clear demarcation of the offensive contaminants. The pollutants are referred to as sludge, toxic sludge, heavy metals, pesticides, particulates, emissions, sewage, smog, or simply contaminants.

¹⁰Estimates of the four models in Table 2 using a sample (N = 177) that omitted the observations with potential concurrent events yield the same results as the complete sample. The coefficients of Democratic president and Democratic Senate are significant at the 10 percent and 5 percent levels, respectively. The signs and significance levels of the other variables are the same as well. The only difference between the models is that PCBs became significant at the 0.05 level in the revised model 4.

Firm size is included among the determinants to account for the possibility of differential treatment of firms by the EPA. For example, Cohen (1992) and Harper and Adams (1996) contend that large firms pay higher fines and damage awards than small firms for similar environmental violations. Their hypothesis is based on the EPA's targeting of deep-pocket offenders, particularly in cases adjudicated under CERCLA (Superfund act). In contrast, Karpoff et al. (1998) postulate that large and politically powerful corporations receive preferential treatment in environmental actions and face smaller relative penalties. In general, the conclusions of past studies are ambiguous with respect to the sign of the firm-size variable.

Table 1—Political Regimes and Sample Environmental Events, 1980-2002

President / Affiliation	Years	Congress	Party in Control		Environmental Events	Type of Legal Action			
			Senate	House		Civil	Criminal	Settlement	Regulation
Carter									
Dem	'79-'80	96th	Dem	Dem	11	6	0	0	5
Reagan									
Republican	'81-'82	97th	Rep	Dem	12	5	0	2	5
Reagan									
Republican	'83-'84	98th	Rep	Dem	18	9	0	1	8
Reagan									
Republican	'85-'86	99th	Rep	Dem	34	6	0	12	16
Reagan									
Republican	'87-'88	100th	Dem	Dem	14	2	0	9	3
Bush I									
Republican	'89-'90	101st	Dem	Dem	30	10	1	8	11
Bush I									
Republican	'91-'92	102nd	Dem	Dem	17	7	0	0	10
Clinton									
Dem	'93-'94	103rd	Dem	Dem	6	2	0	3	1
Clinton									
Dem	'95-'96	104th	Rep	Rep	30	14	0	14	2
Clinton									
Dem	'97-'98	105th	Rep	Rep	2	0	0	2	0
Clinton									
Dem	'99-'00	106th	Rep	Rep	12	2	2	4	4
Bush II									
Republican	'01-'02	107th	Dem ^a	Rep	15	4	0	9	2

Party control information is available at <http://cstl-cla.semo.edu/Renka/ui320-75/presandcongress.asp>

^aSenator Jim Jeffords switched parties from Republican to Independent in May 2001

Table 1 shows the distribution of events by various presidential administrations and congressional sessions. Also listed are the total number and types of infractions classified by political regime. Approximately one-third of the sample observations are civil litigations. Settlements and regulatory actions account for 32 percent and 33

percent of total events, respectively. Criminal prosecutions represent 1.5 percent of the sample observations. The average number of events per year over the nine years of Democratic presidential administrations is 6.78. For the 14 years of Republican presidential administrations the average was 10. The difference between the mean number of events per year was found to be insignificant using a t-test ($t = 1.1040$; $\text{prob.} = 0.283$).

Results

Table 2 reports the least squares regression results for four specifications of equation (1.4).¹¹ The regressands are the two-day abnormal returns ($t = -1, 0$). The regressors are as described in the previous section. Model 1 shows the results of regressing legal action, firm size, and concurrent news on cumulative abnormal returns. The legal-action variables are interpreted relative to the omitted category: settlements. The reduced-form coefficients for regulatory sanctions and criminal actions are significant at the 0.05 and 0.01 levels, respectively. The market responds more negatively to announcements of regulatory sanctions than to settlements, other factors being constant. Negative abnormal returns are, on average, about 23 percent higher for regulatory sanctions than for case settlements. In contrast, negative abnormal returns are substantially lower for announced criminal violations than for case settlements. Criminal penalties usually apply to persons within the offending company and involve monetary sanctions on the individual(s) plus incarceration. In this respect, the direct monetary effect on the offending company may be less than for other forms of litigation.

The market reaction to civil suits is no different than the response to case settlements. The coefficient of firm size is positive and statistically significant in model 1. In percentage terms, the loss of market value attributable to environmental announcements becomes less negative with firm size. This finding is consistent with Karpoff et al. (1998) but differs from Cohen (1992), Harper and Adams (1996), and Jones and Rubin (2001), who find either a negative or no relationship between size and abnormal returns. Abnormal returns are not influenced by concurrent events in the event window.

Model 2 adds three political-regime variables to the initial model. These binary variables contrast Democratic control of the presidency and Congress to the omitted

¹¹Breusch-Pagan tests reject the null hypotheses that the models' regression residuals are homoscedastic at a p-value of 0.0001. The t-values and standard errors are based on White's heteroscedasticity-consistent variance matrix.

Table 2—Estimates of Abnormal Returns for Days t = -1, 0

Regressors	Model 1 N = 201	Model 2 N = 201	Model 3 N = 201	Model 4 N = 201
Civil Action	-0.004 (0.831; 0.4061)	-0.0050 (0.981; 0.3266)	-0.0044 (-0.839; 0.4016)	-0.005 (0.935; 0.3496)
Criminal Action	0.0488 ^a (2.714; 0.0066)	0.0491 ^a (2.857; 0.0043)	0.0453 ^b (2.459; 0.0139)	0.0462 ^a (2.654; 0.0079)
Regulatory Sanction	-0.0125 ^b (2.405; 0.0162)	-0.0150 ^a (2.722; 0.0065)	-0.0102 ^b (2.037; 0.0416)	-0.0132 ^b (2.379; 0.0174)
Company Size	0.0090 ^b (2.348; 0.0189)	0.0107 ^a (2.698; 0.0070)	0.0086 ^b (2.442; 0.0146)	0.0103 ^a (2.738; 0.0062)
Concurrent Events	-0.0032 (0.633; 0.5269)	-0.0025 (0.496; 0.6196)	-0.0052 (1.011; 0.3121)	-0.0045 (0.862; 0.3886)
Sulfur Dioxide			-0.0137 (1.559; 0.1189)	-0.0078 (0.763; 0.4453)
MIC			0.0016 (0.389; 0.6973)	-0.0023 (0.490; 0.6243)
Radioactive			-0.0366 ^c (1.600; 0.1020)	-0.0391 ^c (1.707; 0.0879)
Asbestos			-0.0128 ^b (2.405; 0.0162)	-0.0106 ^c (1.907; 0.0565)
PCB			-0.0109 ^c (1.712; 0.0869)	-0.0101 (1.550; 0.1212)
Lead			-0.0182 ^b (1.993; 0.0463)	-0.0175 ^c (1.853; 0.0638)
Dioxin			0.0003 (0.039; 0.9689)	-0.0034 (0.424; 0.6716)
Democratic President		-0.0094 ^c (1.831; 0.0671)		-0.0098 ^c (1.692; 0.0906)
Democratic Senate		-0.0218 ^b (2.369; 0.0179)		-0.0216 ^b (2.523; 0.0117)
Democratic House		-0.0023 (0.403; 0.6869)		-0.0015 (0.228; 0.8195)
Intercept	-0.05526 ^b (2.089; 0.0367)	-0.0603 ^b (2.211; 0.0270)	-0.0489 ^b (2.043; 0.0411)	-0.0542 ^b (2.058; 0.0396)
F-value	5.95 ^a (0.0004)	4.37 ^a (0.0001)	3.600 ^a (0.0001)	3.29 ^a (0.0001)
Adjusted R ²	0.1111	0.1197	0.1458	0.1559

^a, ^b, and ^c denote statistical significance at the 1 percent, 5 percent, and 10 percent levels, respectively
Enclosed in the parentheses are the t-statistic and probability

Republican control.¹² Two of the coefficients are negative and significant at the 0.10 level or better. According to these results, the market reacts more negatively to environmental violations under Democratic than Republican presidential administrations.

¹²Models 2 and 4 also are run with Republican dummies. In model 2, the coefficients and t-statistics for Republican president, Senate, and House are 0.0056 (1.257), 0.0001 (0.243), and -0.0006 (0.118), respectively. For model 4, the values are 0.0061 (1.316), 0.0021 (0.536), and -0.0016 (0.286).

Furthermore, the negative effect is boosted by the combination of a Democratic president and Democratically-controlled Senate.

Model 3 expands the determinants of abnormal returns to include the influence of specific toxins on the market's reaction to the announcements of environmental infractions. Muoghalu et al. (1990) and Karpoff et al. (1998) allude to the possibility that announcements involving certain pollutants may elicit more negative market responses than others. Karpoff et al. express the issue in terms of types of environmental harm (air emissions, surface water, and subsurface contamination). While not noted specifically, each type of contamination classified by Karpoff et al. involves certain pollutants such as sulfur dioxide, nitric oxide, petrochemicals, lead, and PCBs. Muoghalu et al. (1990) approach the issue by analyzing petrochemical companies as a separate category of polluters.

Each type of environmental harm has unique problems related to its cleanup. Age and site location are important factors in determining cleanup costs. Nevertheless, the chemical properties of each environmental toxin pose different handling, storage, and health problems as well. Thus, the market may perceive different toxins differently in assessing the impact of environmental infractions.¹³ In model 3, four of the toxins yielded significant environmental infractions: radioactivity, asbestos, PCBs, and lead. All four coefficients had negative signs, implying that violations of environmental statutes involving these toxins produce a more negative market response than the mishandling of other chemicals.

The political regimes variables are added to model 3 to obtain the estimations in the last column of Table 2. Democratic president and Democratic Senate maintained their negative signs and levels of significance as in model 2. Separate estimations testing the interactions between the regime variables, legal actions, firm size, and significant toxins, however, yield insignificant results. Shifts in the abnormal return function are not accompanied by changes in marginal reactions of these variables under different political regimes.

Table 3 uses regulatory sanctions (cease-and-desist orders, adverse rulings, citations, and mandatory cleanups) to illustrate the predicted market responses to violations announced in different political environments. Estimates are made for violations involving four toxins (radioactivity, asbestos, lead, and PCBs) and three firm sizes using the regression coefficients from model 4. Small and large firms represent companies with market values one standard deviation below and above the mean, respectively. The most negative responses occur for violations involving

¹³Uncertainty about the varying hazards associated with different toxins may help explain Hamilton's (1995) findings that the larger the number of chemicals a firm the Toxic Release Inventory (TRI), the greater is its market penalty.

radioactivity in regimes where the presidency and control of the Senate were in the hands of the Democrats. Predicted responses are least negative when the presidency and the Senate are controlled by Republicans. The predictions for divided government lie between these extremes. The anticipated effects of adverse announcements are less negative in regimes with a Democratic president and Republican Senate than in regimes with a Republican president and Democratic Senate. Estimates of the market responses involving the other toxins follow a similar pattern with predicted abnormal returns reacting more negatively under Democratic administrations.

Table 3—Predicted Abnormal Returns for Announcements of Regulatory Sanctions under Different Political Regimes and Firm Sizes (Percent)

Political Regime Variable	Radioactivity	Asbestos	Lead	PCBs
Small Firm				
Democratic President and Republican Senate	-5.64	-2.79	-3.48	-2.83
Democratic President and Democratic Senate	-7.80	-4.95	-5.64	-5.17
Republican President and Republican Senate	-4.66	-1.81	-2.50	-1.74
Republican President and Democratic Senate	-6.82	-3.97	-4.66	-4.08
Mean Firm				
Democratic President and Republican Senate	-4.80	-1.95	-2.64	-1.85
Democratic President and Democratic Senate	-6.96	-4.11	-4.80	-4.19
Republican President and Republican Senate	-3.82	-0.97	-1.66	-0.76
Republican President and Democratic Senate	-5.98	-3.13	-3.82	-3.10
Large Firm				
Democratic President and Republican Senate	-3.97	-1.17	-1.81	-0.98
Democratic President and Democratic Senate	-6.13	-3.28	-3.97	-3.32
Republican President and Republican Senate	-2.99	-0.14	-0.83	0.12
Republican President and Democratic Senate	-5.15	-2.30	-2.99	-2.23

Discussion

The links between national elections, political partisanship, and financial market reactions have been examined in several studies (Jayachandran, 2002; Knight, 2006; Reilly and Drzycimski, 1976; Riley and Luksetich, 1980; Shelton, 2005; and Snow et al., 2006a, 2006b). The gist of these studies is well illustrated by the works of Snow et al., who examine all presidential elections from 1880 to 2000. Their analysis reveals a pattern of partisan impacts, showing that electing a Republican president increases equity prices 2 to 3 percent. In a subsequent study they find that a shift in the majority party in Congress from Democrat to Republican raises equity values as well. Other studies buttress the Snow et al. results. For example, Jayachandran determines that loss of control of the Senate in 2001 reduced the market capitalization of firms that made large contributions to the Republican Party. Riley and Luksetich (1980) even develop stock-trading rules based on whether a Republican or Democrat wins a presidential election.

The root of these partisan effects is the perception, as expressed by Reilly and Drzycimski (1976), that Democrats are the party of working people and Republicans the party of business and that the desires of these constituencies are reflected in the economic policies of the parties. Of course, the implementation of these policies occurs at the microeconomic level where government agencies interact with business firms. That is, the intrinsic party ideologies and policies are translated into operational objectives at the agency level. Thus, the decisions forthcoming from the agencies at any given time reflect the regime currently in power. Extending this hypothesis to EPA decisions, we argue that announced environmental infractions are viewed differently by the market depending on the political regime in which they occurred.

In general, past event studies of specific adverse environmental announcements have not included variables to account for shifts in political regimes. Failure to consider the political regime in which an environmental announcement occurs can lead to overestimation or underestimation of predicted abnormal returns.

For example, substituting values for the mean-size firm and radioactive toxins in model 3 yields estimated abnormal returns for an announced regulatory sanction of -3.87 percent, i.e., ignoring the impact of the political environment.¹⁴ Referring to Table 3, which provides estimates based on the political environment over the period 1980-2002, the estimated abnormal returns for a Democratic president and Democratically-controlled Senate is -6.96 percent, however. Predicted abnormal returns under divided government range from -4.80 percent to -5.98 percent. Under a unified Republican regime, the estimated abnormal return is -3.82 percent. For criminal actions involving radioactivity, the estimated abnormal return for model 3 is 1.68 percent, while model 4 produced an abnormal return of -1.02 percent for a Democratic presidency combined with a Democratically-controlled Senate. Mixed regimes range from -0.04 percent for a Republican president and a Democratic Senate to 1.14 for a Democratic president and a Republican Senate.

Summary and Conclusions

Studies (particularly Jones and Rubin, 2001 and Karpoff et al., 1998) find the impact of announced environmental violations on the market value of the offending firms to be influenced by many factors. The type of legal action taken, toxin(s) involved, company size, and forms of emissions (e.g., air or surface water) have been suggested as determinants of the market's reaction to announced environmental

¹⁴The coefficient of concurrent events is insignificant so it is omitted from the calculation. Inclusion of the concurrent events coefficient yields an estimated abnormal return on the announcement of a regulatory sanction of -4.39 percent.

infractions. This paper postulates that the market's reaction to announced environmental mishaps also depends on the political environment in which the violations occur. For instance, enforcement of environmental statutes usually is perceived as more costly under Democratic administrations than Republican administrations (Reilly and Drzycimski, 1976; Riley and Luksetich, 1980; Emerson, and North 2005).

Our results reveal that this perception seems to be the case. Using return data for the period 1980-2002, we conclude that financial markets respond more negatively to the announcement of environmental infractions under Democratic regimes than under Republican administrations, particularly in cases where the Democratic Party controls both the presidency and the Senate. Furthermore, the extent of the negative impact under these recent regimes varies with the type of legal actions, toxins, and firm size. In general, the partisanship findings of extant studies of aggregate market behavior are reflected in the market perceptions of recent policies implemented at the microeconomic level.

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