

Appendix Table D1

Sensitivity Analysis - Part 1: Alternative Model Sets for Estimating TSS Discharge Ratio General Deterrence-related Coefficients (N = 23,193)

Model Set A: Baseline – Inspection Controls, Basic Controls, Regulatory Factors (e.g., limits)

Model Set B: Inspection Controls only

Model Set C: Inspection Controls, Basic Controls (e.g., year indicators)

Model Set D: Inspections, Basic, Regulatory Factors, Facility/Firm Characteristics
 (e.g., facility size)

β = coefficient magnitude

p = coefficient p-value

Regressor	Model Set A		Model Set B		Model Set C		Model Set D	
	β	p	β	p	β	p	β	p
<i>Main Effects</i>								
Sanction Count	0.1888	0.002	0.2248	0.003	0.1736	0.006	0.1881	0.003
Sanction Conditional Avg \$	-0.1299	0.000	-0.1429	0.001	-0.1210	0.000	-0.1289	0.000
<i>Interactive Effect</i>								
Sanction Count \otimes Sanction Conditional Avg \$	-0.0199	0.000	-0.0219	0.001	-0.0186	0.000	-0.0198	0.000
<i>Control Factor Inclusion</i>								
Inspection Controls	X		X		X		X	
Basic Controls	X				X		X	
Regulatory Controls	X						X	
Facility / Firm Controls							X	

Notes:

Regressions include facility-specific indicators.

Appendix Table D2

Sensitivity Analysis - Part 2: Alternative Models for Estimating TSS Discharge Ratio General Deterrence-related Coefficients (N = 23,193)

Alt Model 3: Cluster on Facility rather than State

Alt Model 4: Exclude Facilities that Exit Regulatory System during Sample Period

Alt Model 5: Exclude Interaction between Sanction Count and Sanction Conditional Average Value

Alt Model 6: Include Specific Deterrence Measures of Sanctions

Alt Model 7: Use EPA Region-based Measures of Sanctions

Alt Model 8: Exclude Facilities affected by the Priority Sector program

Alt Model 9: Implement Inverse Hyperbolic Sine Transformation

Alt Model 10: Exclude Inspection Regressor

Alt Model 11a: Decrease Zero Replacement Values in Log Transformation

Alt Model 11b: Increase Zero Replacement Values in Log Transformation

Regardless of Alternative Model:

- Use Model Set A as Regressor Set

Legend:

β = coefficient magnitude

p = coefficient p-value

Appendix Table D2.a. Alternative Models 3 through 6

Regressor	Alt Model 3		Alt Model 4		Alt Model 5		Alt Model 6	
	β	p	β	p	β	p	β	p
<i>Main Effects</i>								
Sanction Count	0.1887	0.004	0.1926	0.005	0.0672	0.263	0.1856	0.002
Sanction Conditional Avg \$	-0.1299	0.000	-0.1312	0.000	-0.0067	0.130	-0.1286	0.000
<i>Interactive Effect</i>								
Sanction Count \otimes Sanction Conditional Avg \$	-0.0199	0.000	-0.0202	0.000	N/A	N/A	-0.0197	0.000

Appendix Table D2.b. Alternative Models 7 through 9

Regressor	Alt Model 7		Alt Model 8		Alt Model 9	
	β	p	β	p	β	p
<i>Main Effects</i>						
Sanction Count	0.1346	0.061	0.2018	0.005	5.3246	0.000
Sanction Conditional Avg \$	-0.0757	0.059	-0.1402	0.000	0.0001	0.803
<i>Interactive Effect</i>						
Sanction Count \otimes Sanction Conditional Avg \$	-0.0108	0.108	-0.0214	0.000	-0.4506	0.000

Appendix Table D2.c. Alternative Models 10 through 11

Regressor	Alt Model 10		Alt Model 11a		Alt Model 11b	
	β	p	β	p	β	p
<i>Main Effects</i>						
Sanction Count	0.1891	0.002	0.1878	0.002	0.1896	0.002
Sanction Conditional Avg \$	-0.1302	0.000	-0.1295	0.000	-0.1303	0.000
<i>Interactive Effect</i>						
Sanction Count \otimes Sanction Conditional Avg \$	-0.0199	0.000	-0.0198	0.000	-0.0199	0.000

Notes:

Regressions include facility-specific indicators.

Appendix Table D3

**Marginal Effects of Individual General Deterrence
Enforcement Components and Comparisons:
Evaluated at Sample Minima and Maxima –
Estimates based on Inverse Hyperbolic Sine Specification**

(significantly negative effects shown in **bold**, significantly positive effects shown in *italics*)

β = marginal effect magnitude

p = marginal effect p-value or test statistic p-value

Conditional Value		Individual Marginal Effects				Comparison Test		Conclusion
Certainty	Severity	Certainty		Severity		Statistic	p	
		β	p	β	p			
Min	Min	<i>5.3246</i>	<i>0.000</i>	0.0001	0.803	15.21	0.000	Certainty < Severity
Min	Max	-2.1623	0.051	0.0001	0.803	4.08	0.051	Certainty > Severity
Max	Min	<i>5.3246</i>	<i>0.000</i>	-0.0140	0.000	15.23	0.000	Certainty < Severity
Max	Max	-2.1623	0.051	-0.0140	0.000	4.05	0.052	Certainty > Severity