



Contract Renegotiation and Rent Re-distribution: Who Gets Raked Over the Coals?

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The Question:

How do Policy Shocks Affect Long-Term Contracts?

The Context:

Contracts: U.S. coal contracts

Policy Shock: 1990 Clean Air Act

Model

Contracts range in their completeness or flexibility due to asset specificity, availability of alternatives, etc

The Hypothesis:

The degree of flexibility within a contract affects the opportunities for parties to respond to outside (policy) shocks.

Therefore, more (less) flexibly written contracts should respond to policy shocks better (worse) and have a lower (higher) probability of explicit renegotiation

History of SO₂ Regulation

The Clean Air Act (CAA) of 1970

States “regulate” existing boilers, generally with generous emissions standards

Feds regulate new boilers w/ a binding emissions standard

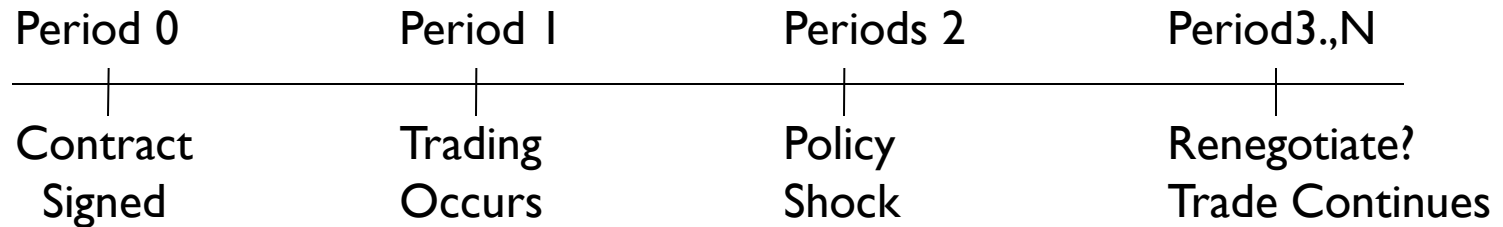
1990 CAA, Title IV

National cap on SO₂ emissions w/ tradable permits

Phase I 1995-1999: 263 “dirtiest” boilers

Phase II 2000-: All boilers

Timing:



Data:

Coal Transportation Rate Database-
maintained by the US Energy
Information Administration

Estimation:

Logit/Probit

Dependent Variable

- Contracts with a vintage of 1990 or earlier that were still in effect in 1994 are used in the analysis
- Binary, Renegotiated contracts set equal to 1; Contract continued equal to 0
- Contracts signed in 1991 or later are excluded from the analysis.

Independent Variables:

Contract Parameters

Sulfur upper bound; Quantity; Price adjustment mechanism; Price relative to market; Years from 1994 to expiration; Year signed dummies

Plant & Mine Attributes

% of total coal from contract; Distance apart; Phase I status; Minemouth & Coal region dummies

Expected Signs

Dependent Variable: Renegotiated 1991-1994 or Not	
Independent Variable	Expected Sign
Allowable Sulfur Upper Bound	-
Phase I Plant	+
Phase I * Allowable Sulfur	+
Distance Apart (100 Miles)	+
Plant Dedicated Assets	+
Mine Dedicated Assets	+
Minemouth Plant	+
Quantity (1000 tons)	+
Rigid Price Adjustment	+
Relative Price	?
Years Till Expiration	+
88-90 Year Signed	?
85-87 Year Signed	?
Interior Coal Mine	?
Western Coal Mine	?
?= Ambiguous	

Results:

Probit Estimation-Marginal Effects		Full Sample		Contracts Signed Pre-1988	
Dependent Variable: Renegotiated between 1991-1994 or Not					
Variable	Estimate	Std. Error	Estimate	Std. Error	
Allowable Sulfur Upper Bound	-0.11***	0.04	-0.11**	0.05	
Phase I Plant	-0.07	0.13	0.06	0.16	
Phase I * Allowable Sulfur	0.12*	0.07	0.15*	0.08	
Distance Apart (100 Miles)	0.03***	0.00	0.03***	0.00	
Plant Dedicated Assets	-0.12	0.12	-0.08	0.12	
Mine Dedicated Assets	-0.15	0.15	-0.06	0.15	
Minemouth Plant	-0.20	0.13	-0.23	0.13	
Quantity (1000 tons)	0.05**	0.02	0.05*	0.02	
Rigid Price Adjstment	0.11	0.08	0.19**	0.08	
Relative Price	-0.03*	0.02	-0.03*	0.02	
Years Till Expiration from 1994	0.01**	0.00	0.02**	0.00	
88-90 Year Signed	-0.02	0.08			
85-87 Year Signed	-0.06	0.09	-0.06	0.09	
Interior Coal Mine	0.09	0.1	0.07	0.1	
Western Coal Mine	-0.25**	0.08	-0.25**	0.08	
N	274		229		
R-Squared	0.16		0.21		

*, **, *** indicate 10%, 5% and 1% statistical significance

Counterfactual

Probit Estimation-Marginal Effects		Full Sample
Dependent Variable: Renegotiated between 1984-1986 or Not		
Variable	Estimate	Std. Error
Allowable Sulfur Upper Bound	-0.06**	0.03
Phase I Plant	0.33***	0.06
Distance Apart (100 Miles)	0.00	0.00
Plant Dedicated Assets	-0.43***	0.13
Mine Dedicated Assets	0.20*	0.11
Minemouth Plant	-0.10	0.14
Rigid Price Adjustment	-0.04	0.07
Quantity (1000 tons)	0.03	0.03
Relative Price	-0.01	0.02
Years Till Expiration	0.01	0.01
83-84 Year Signed	0.12	0.11
Interior Coal Mine	0.01	0.09
Western Coal Mine	-0.10	0.10
N	281	
R-Squared	0.12	

*, **, *** indicate 10%, 5% and 1% statistical significance

Price in Renegotiated Contracts

Dependent Variable: Real Price of Coal		
Estimation: Hedonic Price Difference-in-Difference Model	Difference-in-Difference Parameter	
Sample	Estimate	Std. Error
All Plants (N=3409)	-1.32	1.31
All Phase I Plants (N=2992)	-1.77	1.17
Phase I Plants with Western Mine Contracts (N=348)	3.38	1.99
Phase I Plants with Interior Mine Contracts (N=813)	-2.03	1.28
Other Explanatory Variables: Btu, Sulfur, Ash, & Moisture Content; Total Distance; Contract, Year & Mine District Dummies		
Errors Clustered by Utility		

Implications

Contract for Phase I plant with high allowable sulfur upper bound more likely to be renegotiated

Results not consistent with long-term coal contracts impeding the full cost savings potential of Phase I of 1990 CAAA

Renegotiations



Summary Statistics

	Full Sample	
	N=273	
Variable	Mean	Std. Dev.
Renegotiated Contracts	0.36	0.48
Duration	21.90	10.67
Allowable Sulfur Upper Bound	1.39	1.26
Phase I Plant	0.24	0.43
Distance Apart (100 Miles)	4.15	4.39
Plant Dedicated Assets	0.37	0.34
Mine Dedicated Assets	0.19	0.27
Quantity (1000 tons)	1.15	1.30
Minemouth Plant	0.05	0.21
Rigid Price Adjustment	0.81	0.40
Relative Price	0.29	1.53
Years Till Expiration from 1994	7.03	5.92
88-90 Yr Signed	0.14	0.35
85-87 Year Signed	0.14	0.34
Appalachian Coal Mine	0.49	0.50
Interior Coal Mine	0.18	0.36
Western Coal Mine	0.31	0.48