

Characterizing Risk Regulations of US Transportation Fuels

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Motivation

1. *How the regulatory process works*

- 10:1 ratio of *rules** to statutes
- Collect data to complement many case studies (e.g., Stickers)

2. Importance of transportation fuels regulations

- Cover broad spectrum of activities and risks (e.g., on-shore / offshore extraction, distribution, refining, trucking, USTs)
- EPA reformulated gas requirements affect regional gasoline prices
- BP refinery explosion

3. Limitations of empirical studies

- Single agency, narrow decision space
- Relatively small sample sizes
- Data collection capabilities for risk regulations limited



Related Literature

Political Control of the Bureaucracy

Theory and Evidence of Agency Rulemaking

Kerwin (2003), West (1995)

Interest Group Influence on the Bureaucracy

Magat et al.(1986) – EPA effluent standards

Cropper et al. (1992) – pesticide pro or no?

Ando (1999) – ESA listing & timing

Golden (1998) – cross section

Yackee and Yackee (2006) – cross section



Research Questions

1. Descriptive

- Are stylized facts about the rulemaking process accurate?

2. Analytic

- Do stakeholders have a voice? Does their voice matter? Does industry dominate?
- How do institutional factors shape the process?
- Does benefit-cost analysis, treatment of uncertainty, (systematically) affect rulemaking?



Overview of Research

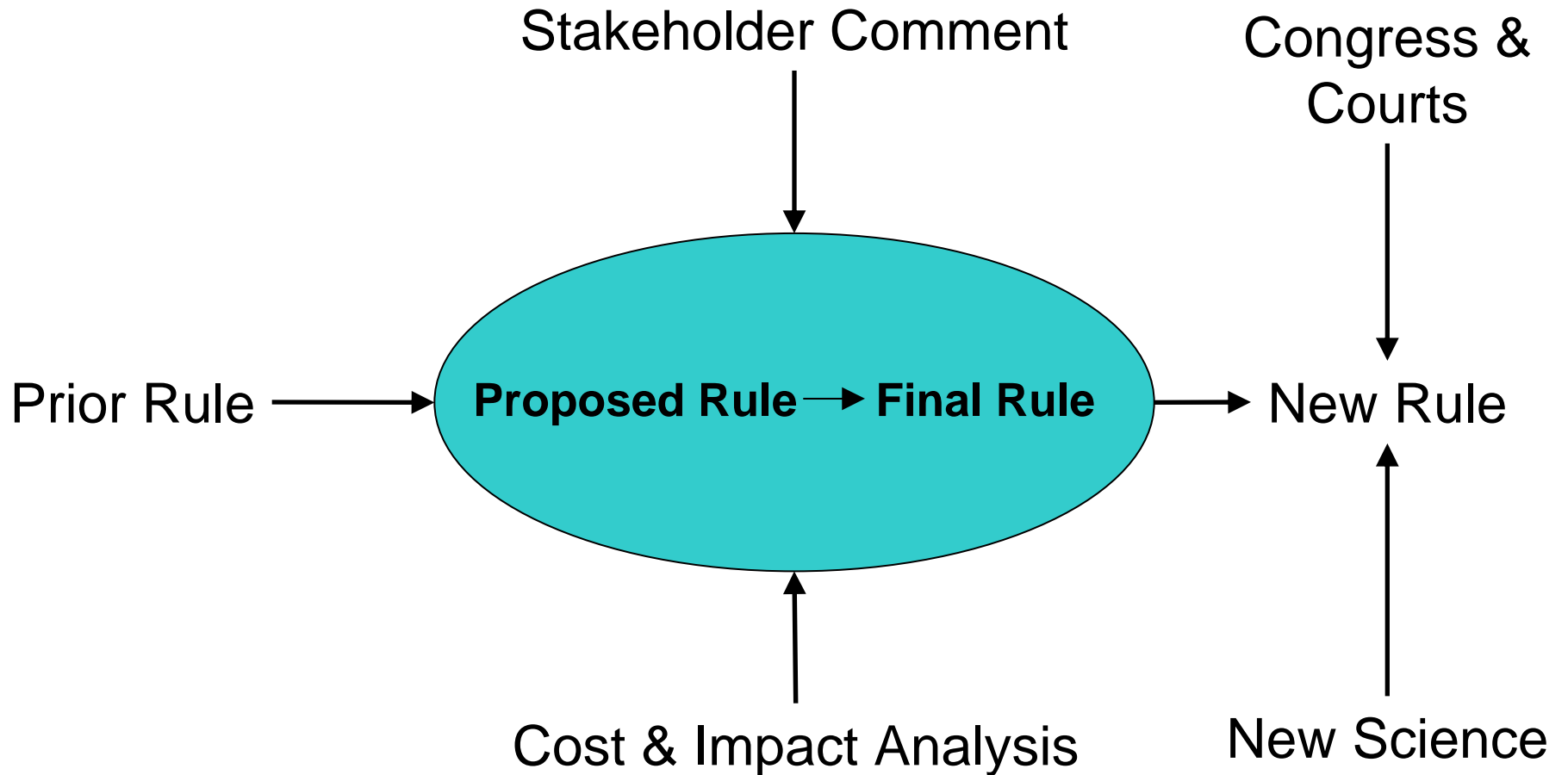
1. Identify and collect data for 212 agency rules that *regulate risks* (environmental, health, safety)
2. Quantify information about rulemaking processes
 - Basic information
 - Stakeholder participation
 - *Stringency*
3. Analyze factors affecting number and direction of stringency changes during rulemaking



U.S. Federal Rulemaking Process



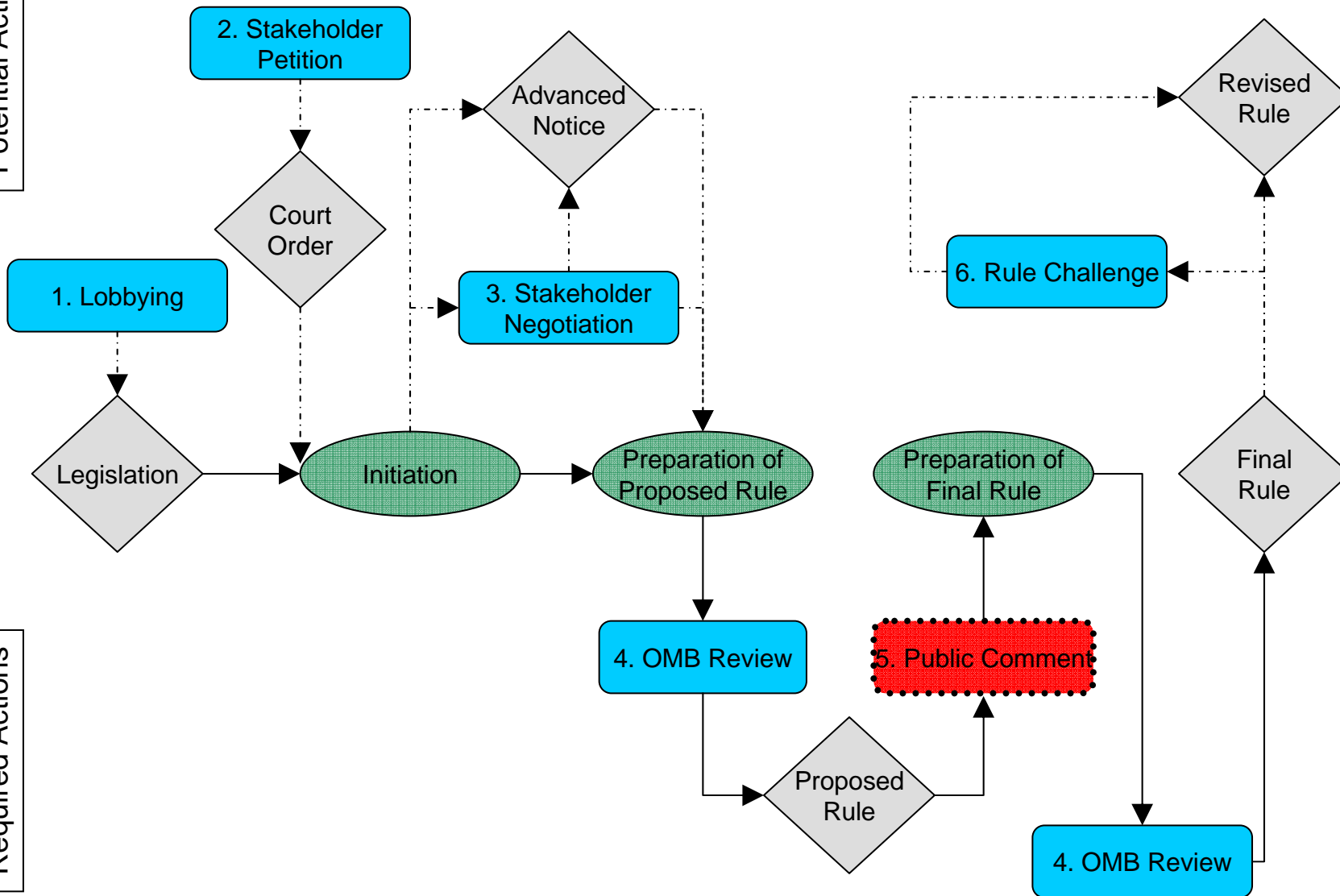
Components of Rulemaking



US Federal Rulemaking Process (since 1946)

Potential Actions

Required Actions



Database and Descriptive Statistics



Fuels Regulation Database

Data sources

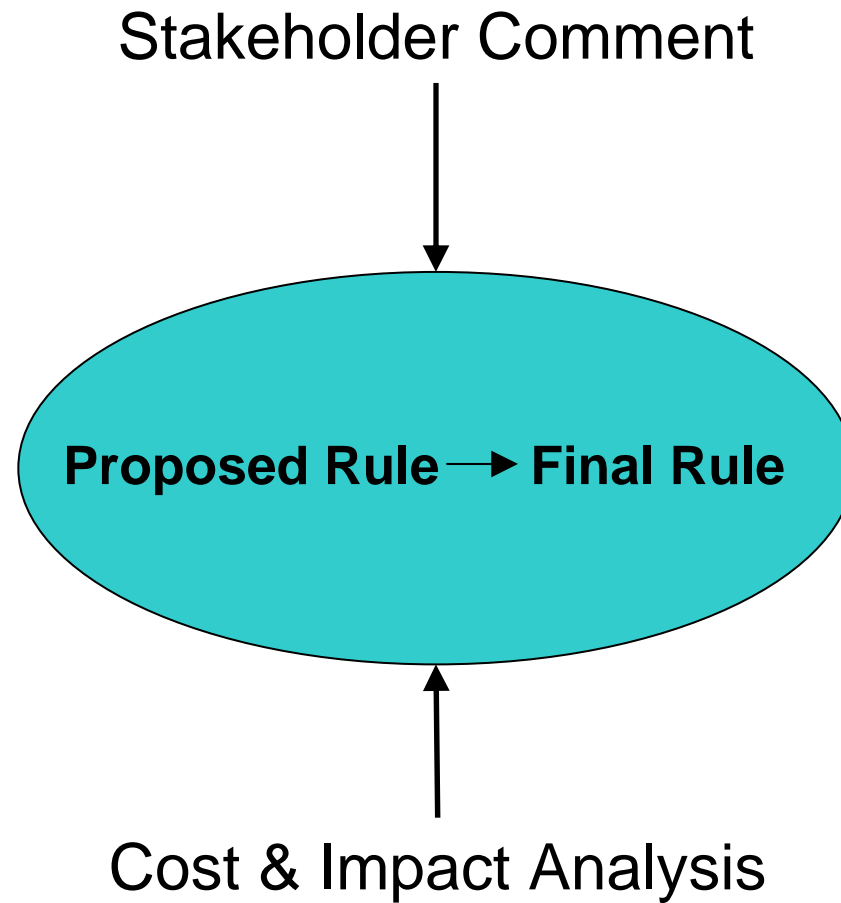
- Federal Register
- Docket archives
 - » Comments
 - » Analysis documents

Rule Selection

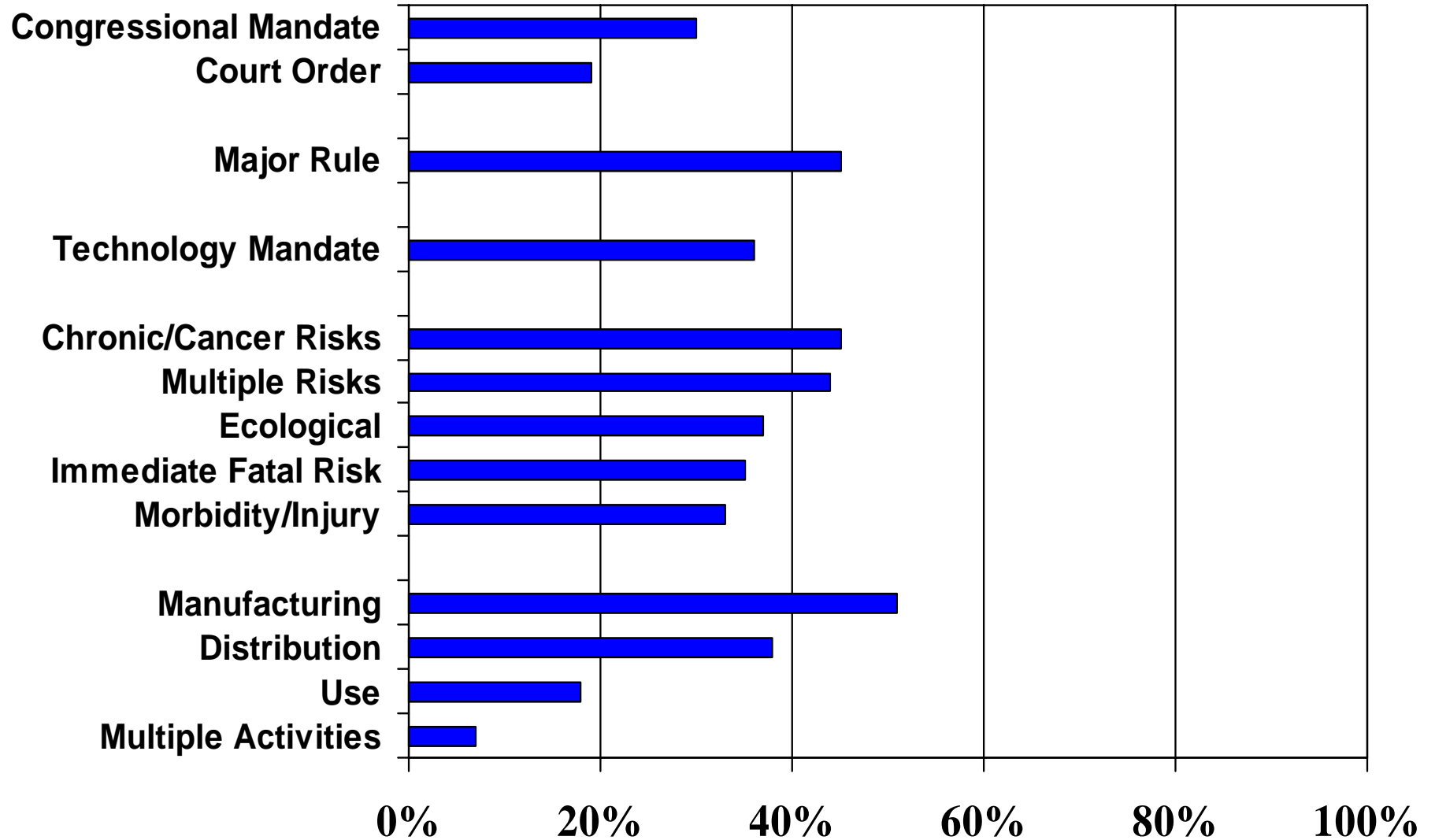
- Risks related to fuels
- Notice & final rule
- Risk reduction strategy

EPA	Air	65
	Water	19
	Waste	28
	Toxics	10
DOT	Coast Guard	20
	RSPA (pipelines)	34
	NHTSA (fuel tanks)	10
	FAA/FHA/FRA	3
	OSHA	11
	Minerals Management	9
	Consumer Products	1
	TOTAL	210

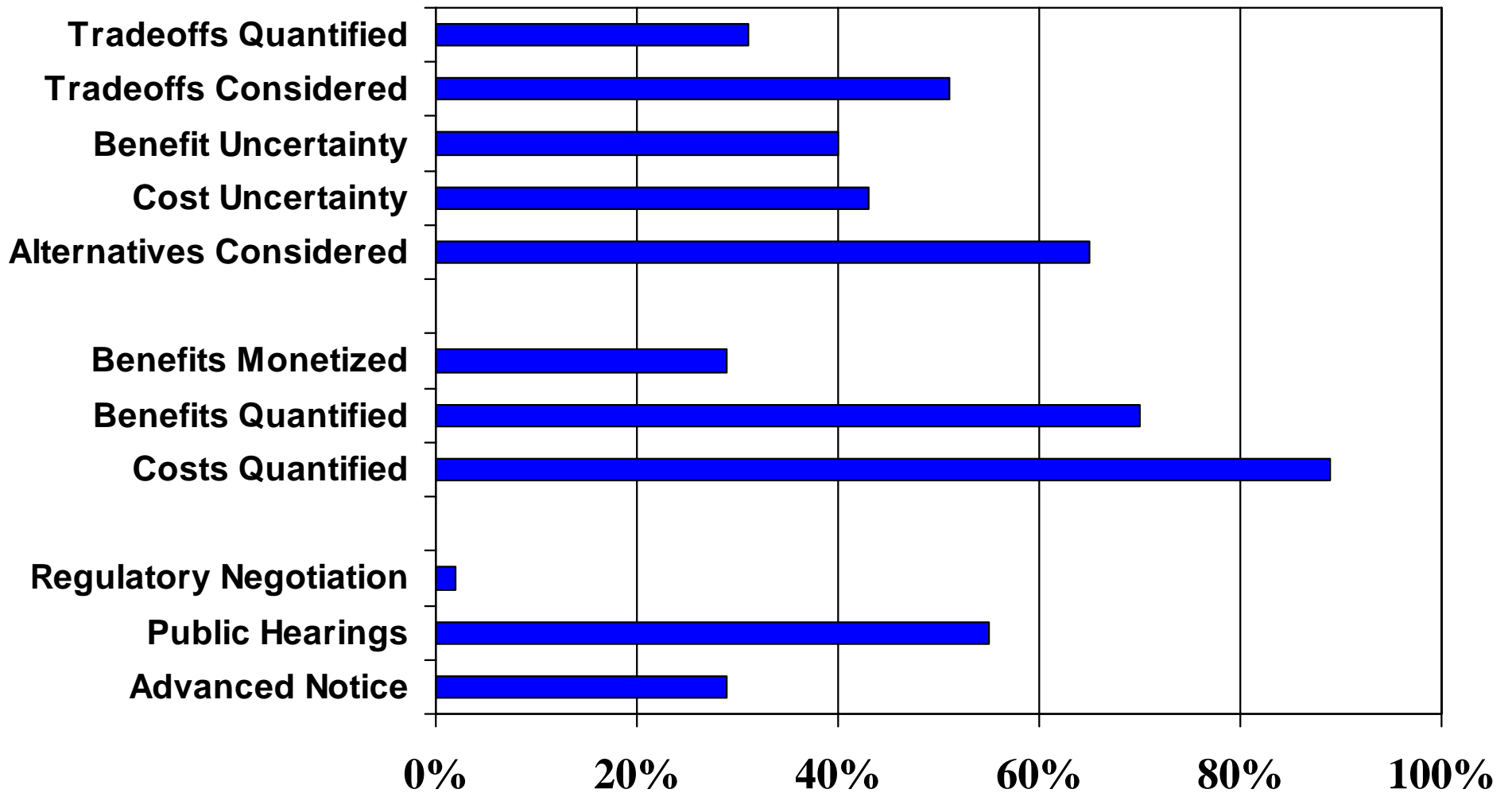
Rulemaking Focus in this Paper



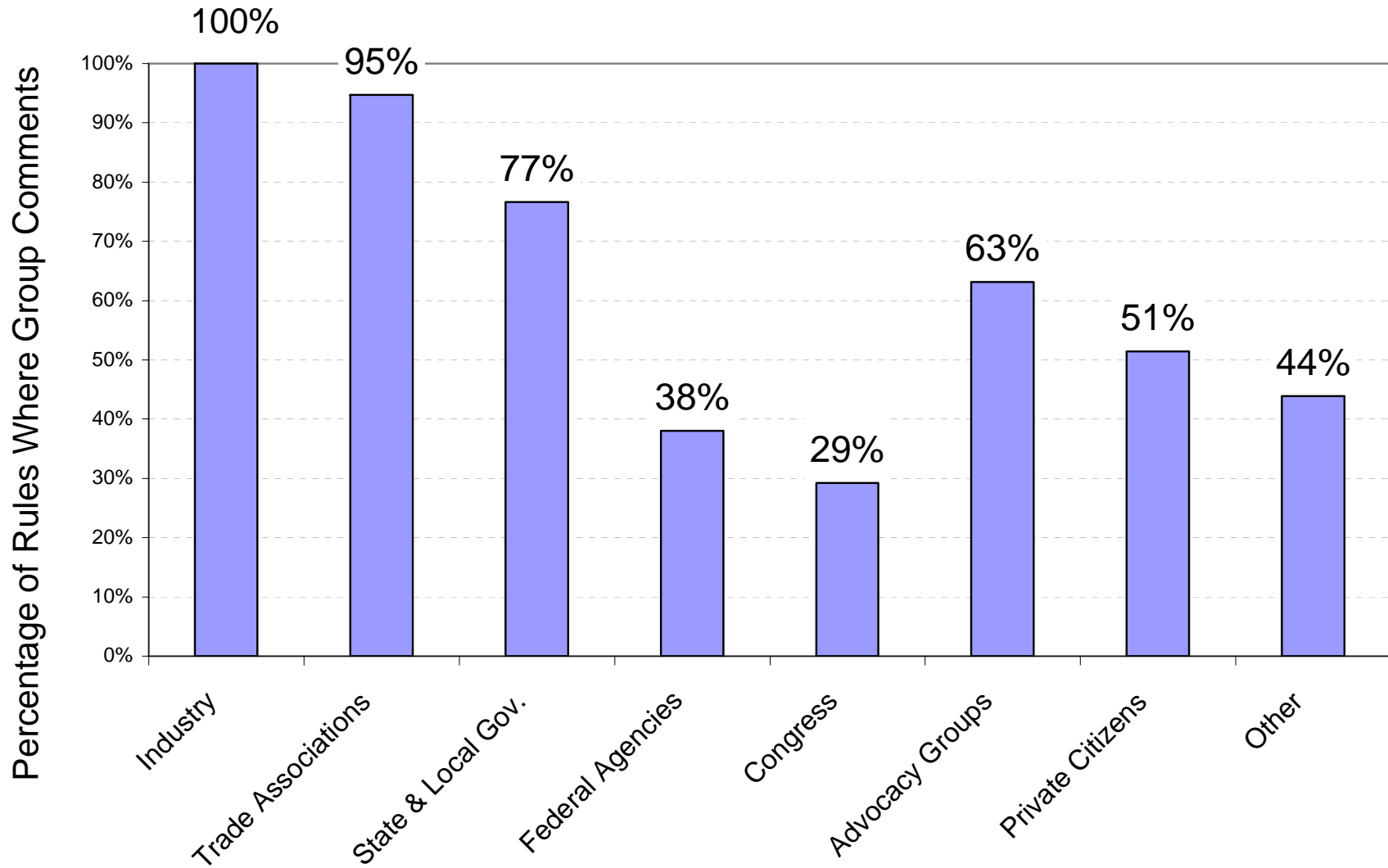
Summary Statistics: Types of Rules



Agency Analysis and Other Rulemaking Characteristics

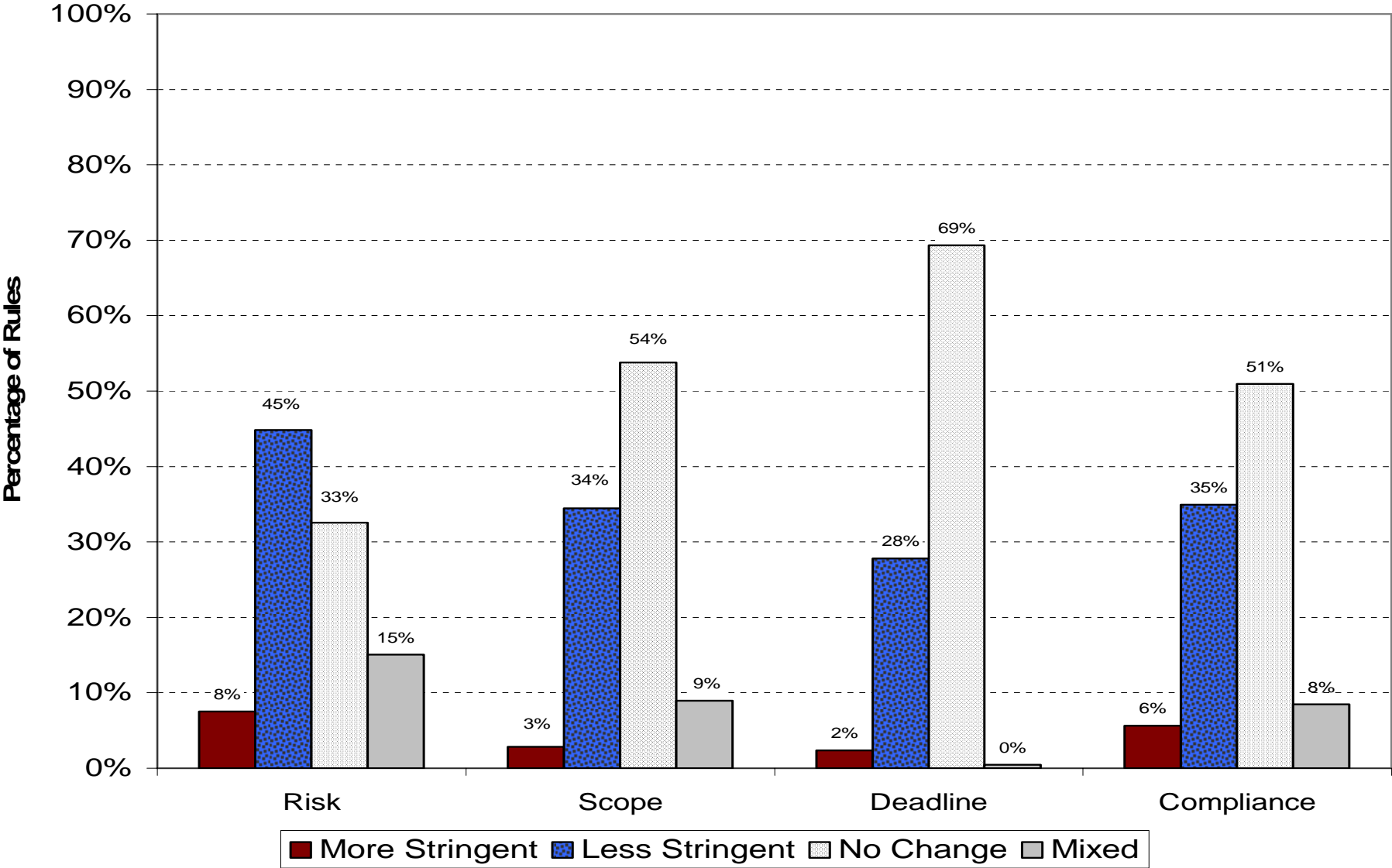


Comment Submissions By Group

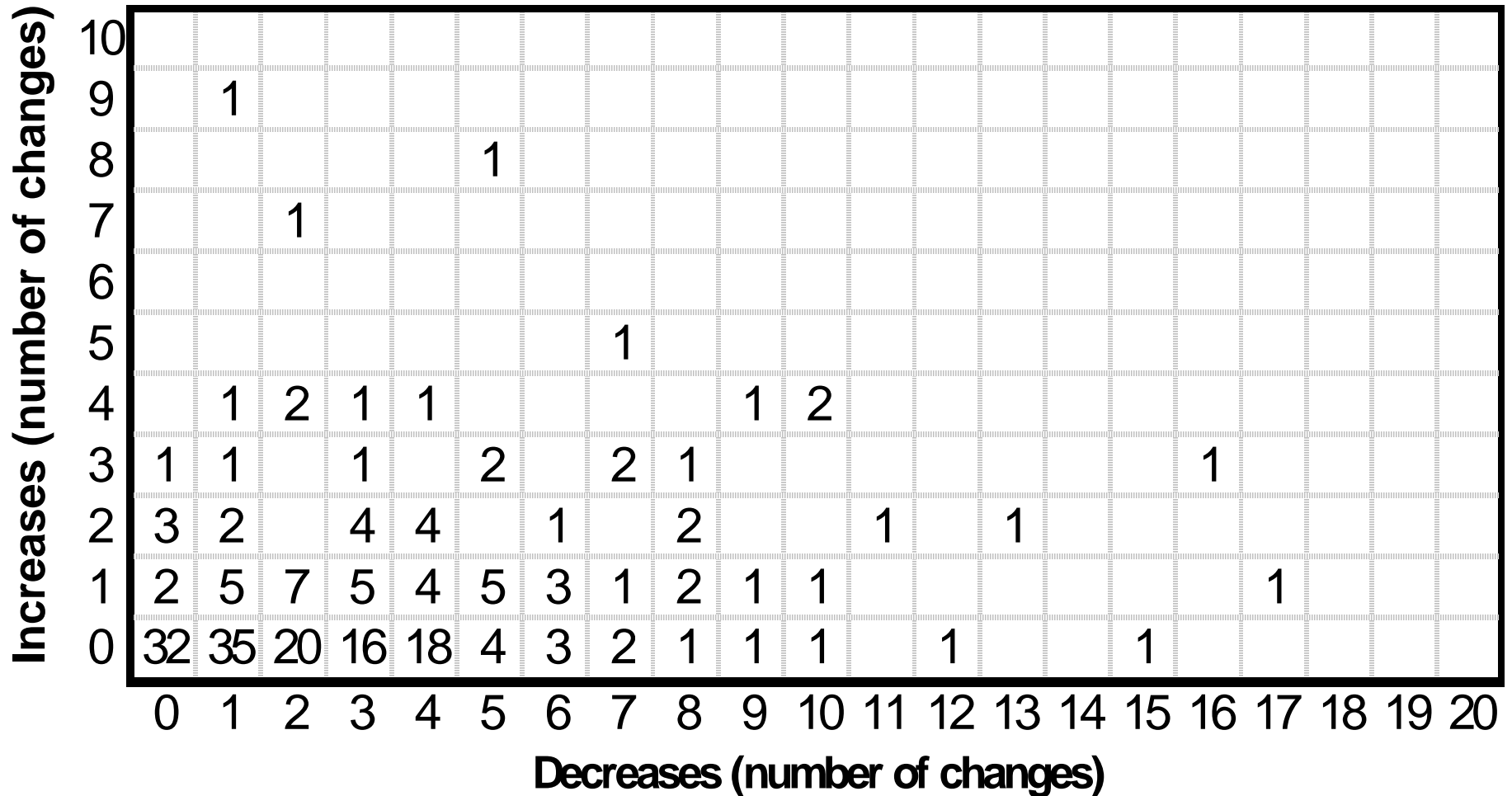


N=171

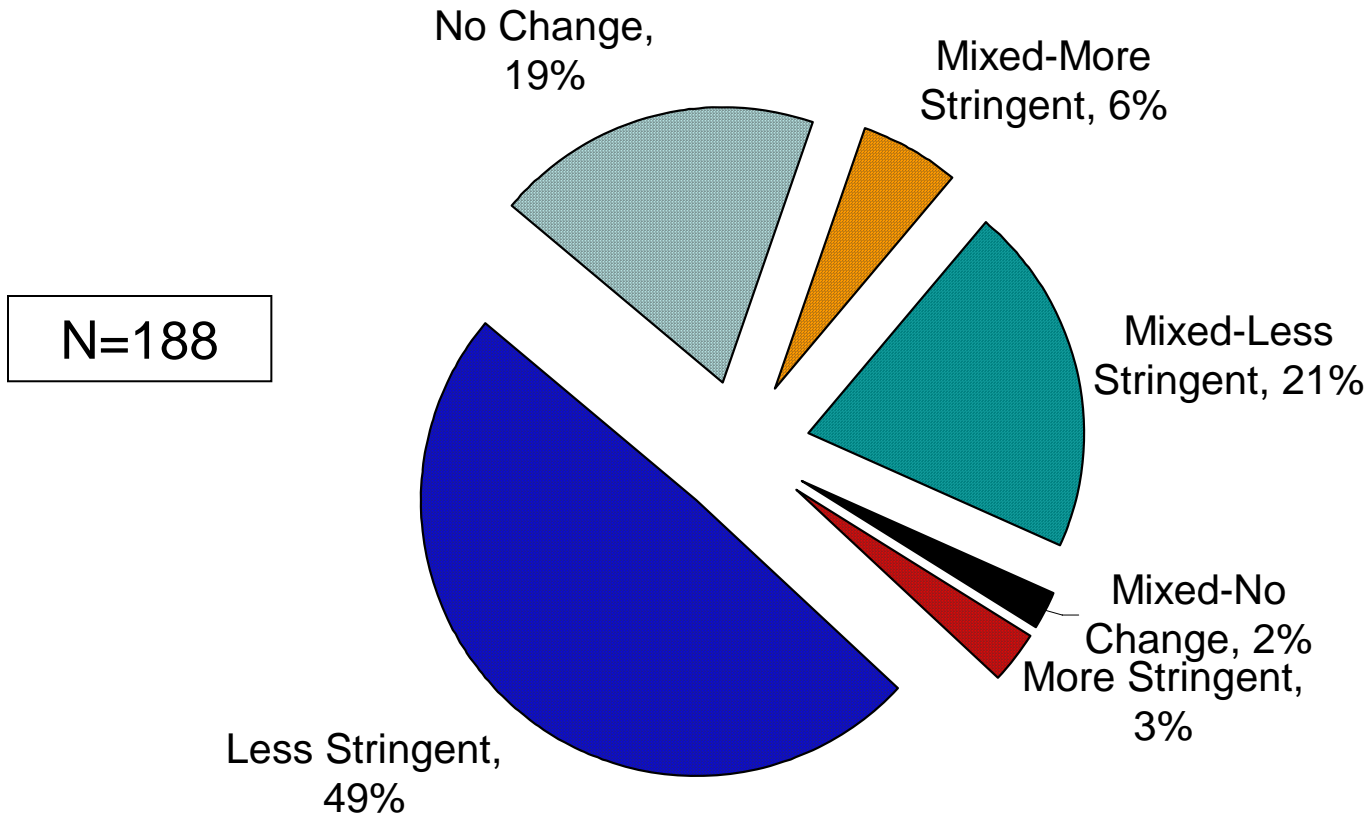
Direction of Stringency Changes from Proposed Rule to Final Rule



Stringency Increases vs. Decreases (Number of Rules)



Direction of Stringency Change: Proposed to Final Rule



Empirical Analysis



Empirical Analysis

Number of Changes (how much “action” is there?)

- Dependent variable: total number of stringency changes from proposed to final rule (increases + decreases)
- Negative binomial to predict number of changes

Direction of Changes (what factors, if any, systematically influence whether rules become more or less stringent?)

- Dependent variable: stringency either decreased (0) or didn't decrease (1)
- Simple Logit estimation



Explanatory Variables

Agency

Rule Characteristics:

- Original, FR Pages, Technology Standard, Major, Annual Cost

Political Control, Conditions

- Court order, Congressional Mandate, Hard Deadline, OMB Review
- Divided Government, Rule Spans Administrations

Stakeholder Comments

- # and whether for Advocacy, Industry, State & Local Govt

Risk Type

- ecological, chronic/cancer, immediate risk to life, morbidity



		Number (+ more changes)
Rule Specs	Original	0.227
	FR Pages	0.0042***
	Tech	-0.365**
	Cost	0.0006
Agency	MMS	-1.46***
	OSHA	0.10
Political Control	Court	-0.3931**
	Mandate	0.293
	Deadline	0.3849**
Political Setting	Divided Govt	0.057
	Span Admins	0.055
Interest Groups	Industry (#)	0.0004
	Advocacy (#)	-0.0087*
	Advocacy (0,1)	-0.0369
Risk Type	Chronic	0.3991**
*** 1%; ** 5%; *10%; N=167		Adj R² = .12

		Direction (– less stringent)
Rule Specs	Original	-1.72**
	FR Pages	0.00068
	Tech	0.7063
	Cost	-0.00028
Agency	MMS	1.57
	OSHA	3.44***
Political Control	Court	-0.3544
	Mandate	0.3584
	Deadline	0.1796
Political Setting	Divided Govt	1.1647***
	Span Admins	-0.9228
Interest Groups	Industry (#)	-.0102**
	Advocacy (#)	0.0166
	Advocacy (0,1)	1.521**
Risk Type	Chronic	-1.8504**
*** 1%; ** 5%; *10%; N=167		LR = 51.3***

Stringency Model →		Number	Direction
Rule Specs	Original	0.227	-1.72**
	FR Pages	0.0042***	0.00068
	Tech	-0.365**	0.7063
	Cost	0.0006	-0.00028
Agency	MMS	-1.46***	1.57
	OSHA	0.10	3.44***
Political Control	Court	-0.3931**	-0.3544
	Mandate	0.293	0.3584
	Deadline	0.3849**	0.1796
Political Setting	Divided Govt	0.057	1.1647***
	Span Admins	0.055	-0.9228
Interest Groups	Industry (#)	0.0004	-0.0102**
	Advocacy (#)	-0.0087*	0.0166
	Advocacy (0,1)	-0.0369	1.521**
Risk Type	Chronic	0.3991**	-1.8504**
*** 1%; ** 5%; *10%; N=167		Adj R ² = .12	LR = 51.3***

Summary

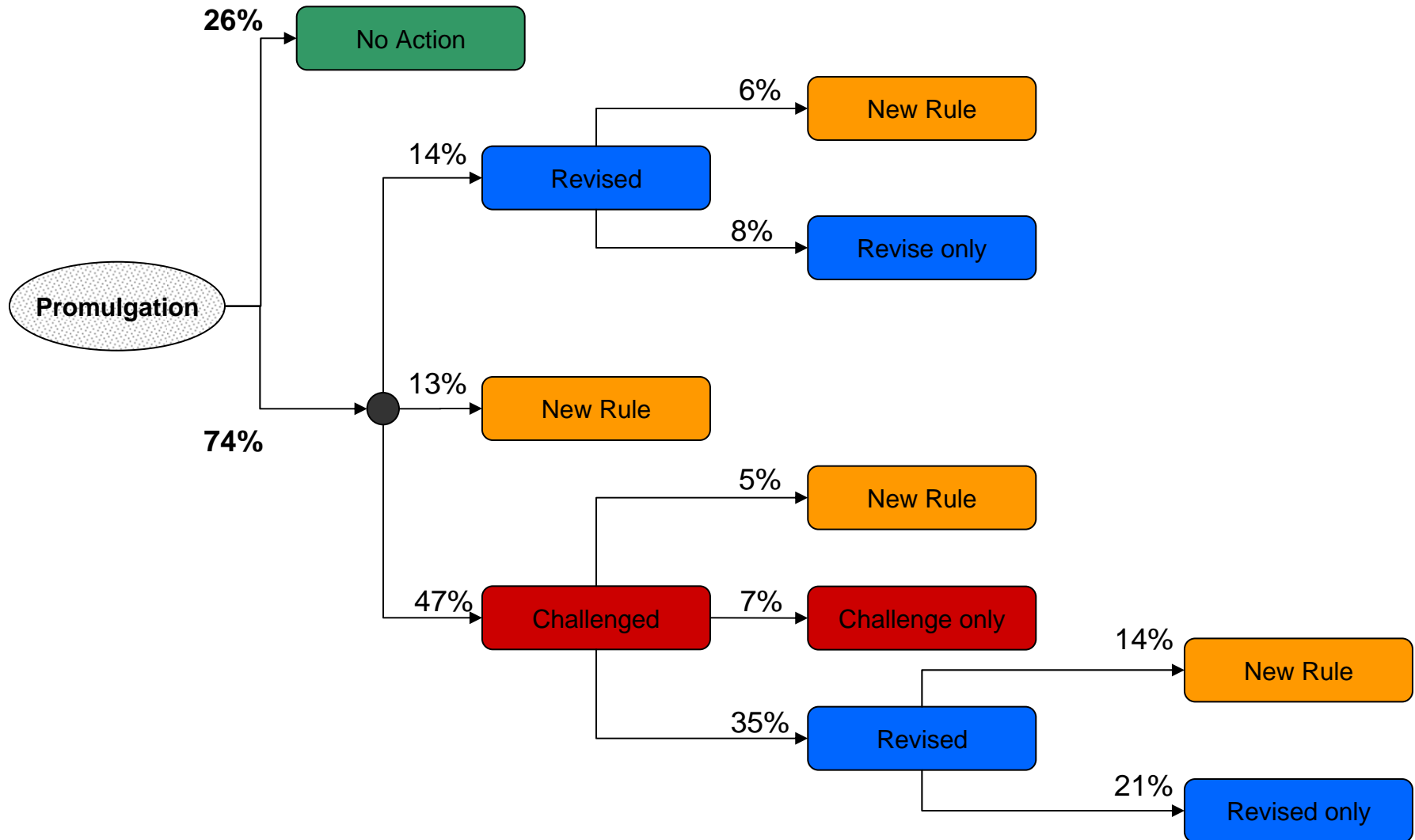
- Stringency levels of *most* risk regulations reduced between proposed and final stage
- Overlap between “busy” rulemaking and effecting stringency change are limited, except:
 - Regulation of chronic risk to life
 - Advocacy group participation
 - Controlling for cost matters; doesn’t drive results
- Stakeholder participation matters, signs predictable
- B-C analysis doesn’t show systematic effects



Some Further Data



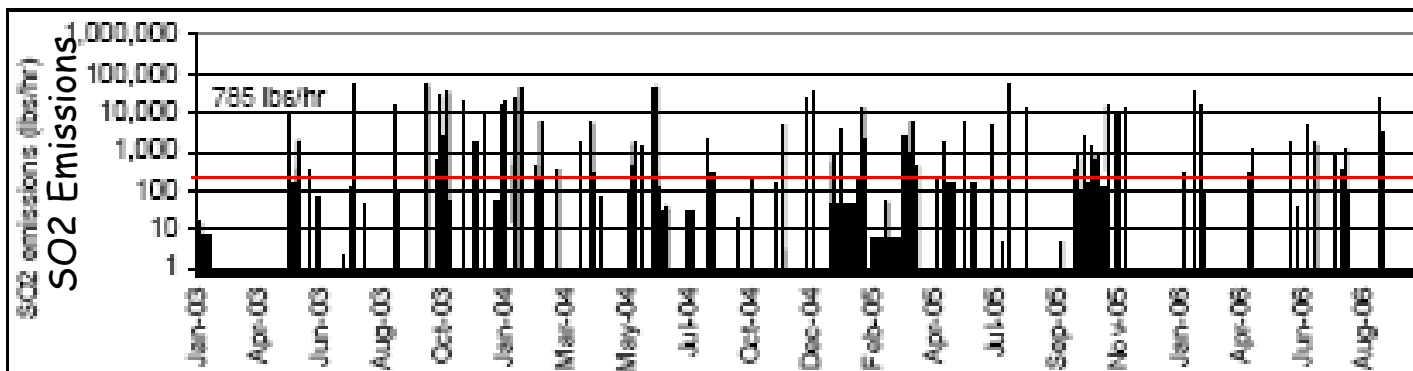
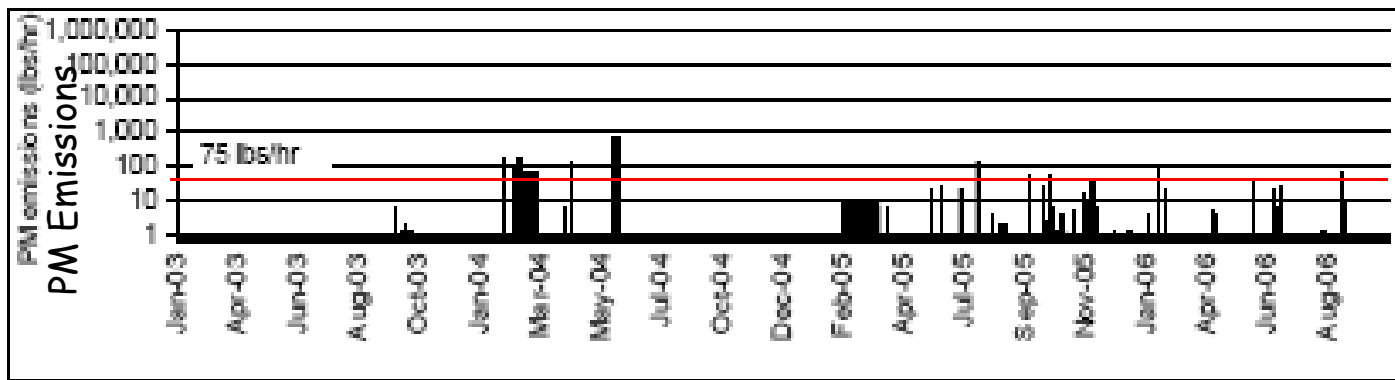
Regulatory Fate



Refinery Project “Upset” Emissions



Upset Emissions at Premcor Refinery, Port Arthur, TX



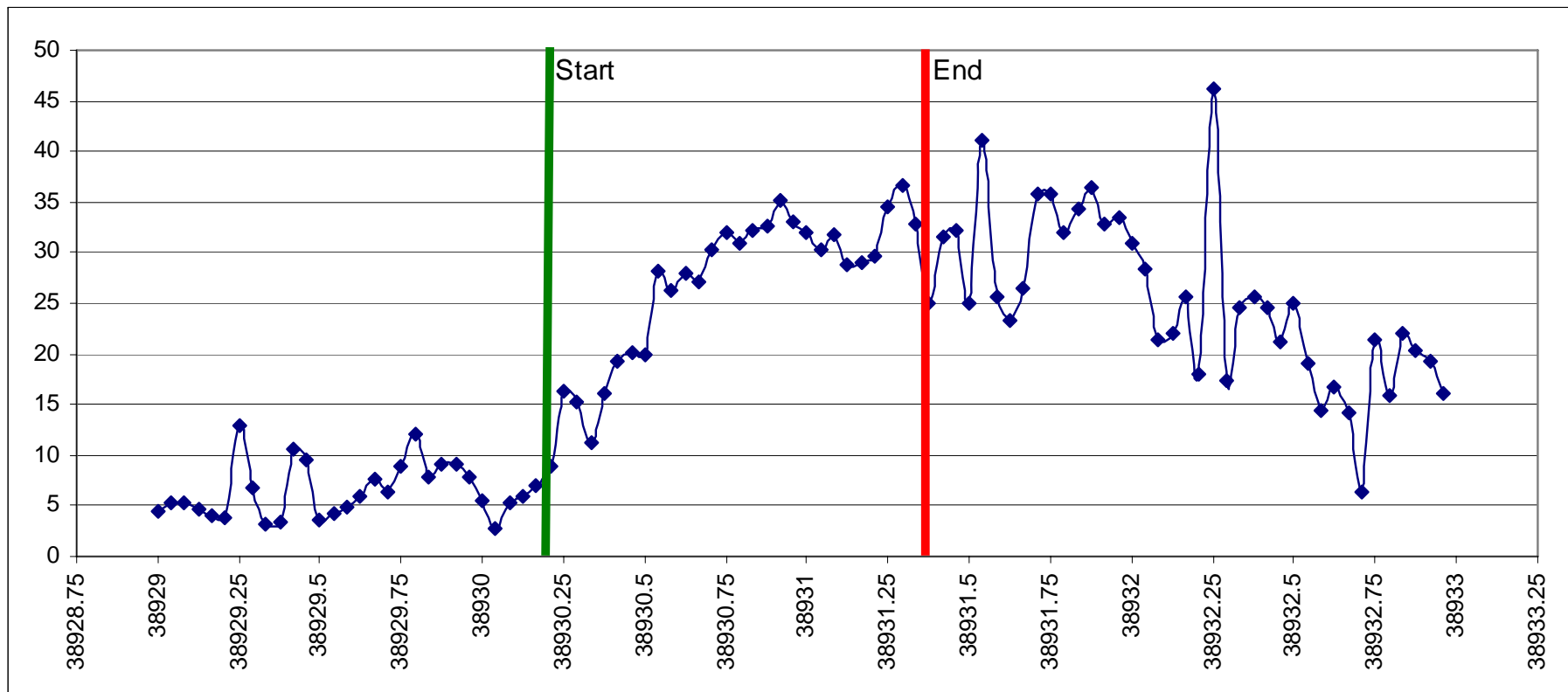
Port Arthur Refinery Equivalence

	<u>SO₂</u>	<u>NO_x</u>	<u>CO</u>	<u>VOCs</u>	<u>PM</u>
Average Normal Emissions per year (tons)	1,422	32	109	434	22
Refinery Equivalence (barrels/day)	76,431	2,288	43,451	65,804	11,485

Based on *SO₂*, *CO*, and *VOCs*, upsets are equivalent to an additional 50,000 bbl/d refinery in the region



Upset Emissions and PM Levels Shell Oil, Deer Park Refinery



Name of Refinery: Chevron USA INC.
Location: El Paso, TX

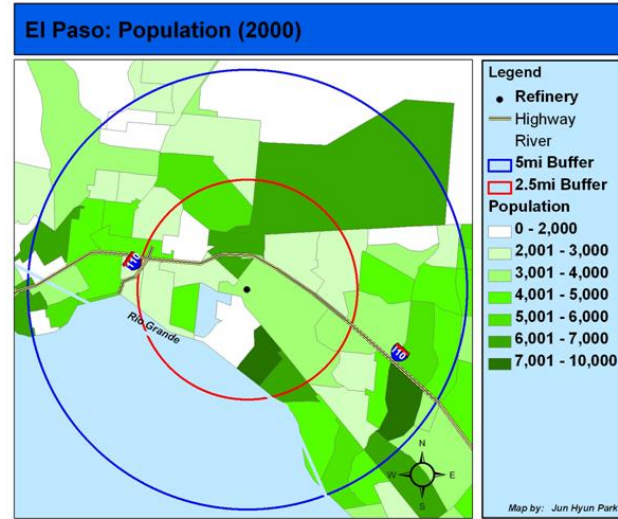
Refinery capacity: 90,000 barrels per calendar day (1999) **Prevailing wind:** S
Percent PM10 from the refinery within El Paso: 47.0%

● **Table: Racial Population Difference Nearby Refinery (2000)**

	El Paso	2.5 mile	5 mile	Upwind	Downwind
Total population	679,922	60,743	198,270	18,268	33,791
White population %	73.28%	52.2%	60.9%	71.2%	51.1%
Black population %	3.5%	26.4%	24.0%	20.4%	15.1%

The black population of El Paso are highly concentrated within the five mile radius of the refinery. Although only 3.5% of the entire population in El Paso are blacks, the concentration of blacks nearby the refinery is 24.0% within the five mile radius and 26.4% within the 2.5 mile radius.

Data show that higher population is living in the downwind tracts of the refinery by the coast but the percentage of both white and black are lower compared to the communities within the 2.5 mile radius of the refinery indicating that high concentration of other minor races are living in the downwind tracts of the refinery.



● **Figures**

Top: Map illustrating total population tracts within the five mile radius of the refinery (2000).

Left: Map illustrating white population percentage within the five mile radius of the refinery (2000).

Right: Map illustrating black population percentage within the five mile radius of the refinery (2000).

