Evidence Based Compliance Assurance Webinar Series

Title: “Rule and permit design”
Presenter: Carey Coglianese, University of Pennsylvania Carey Law School
Time: 2pm ET / 11am PT on July 22, 2020
Skype Conference ID: 744 242 829

Series information:
www.epic-evidence.org/webinars

Rule and Permit Design

Cary Coglianese
Edward B. Shils Professor of Law
Director, Penn Program on Regulation
University of Pennsylvania Law School

U.S. Environmental Protection Agency
Evidence Based Compliance Assurance Webinar Series
July 22, 2020

PENN PROGRAM ON REGULATION

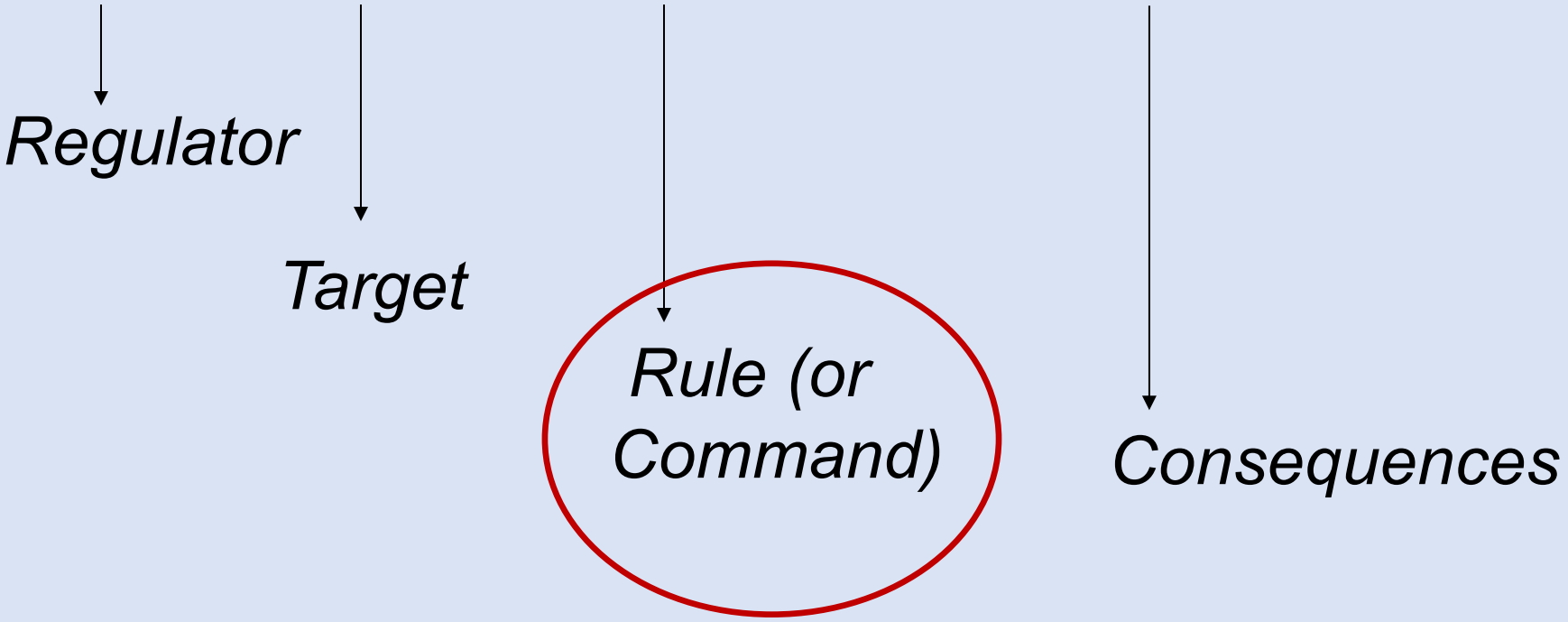
Regulatory Problems

"The major types of market failure include: **externality**, **market power**, and inadequate or **asymmetric information**. Correcting market failures is a reason for regulation, but it is not the only reason."

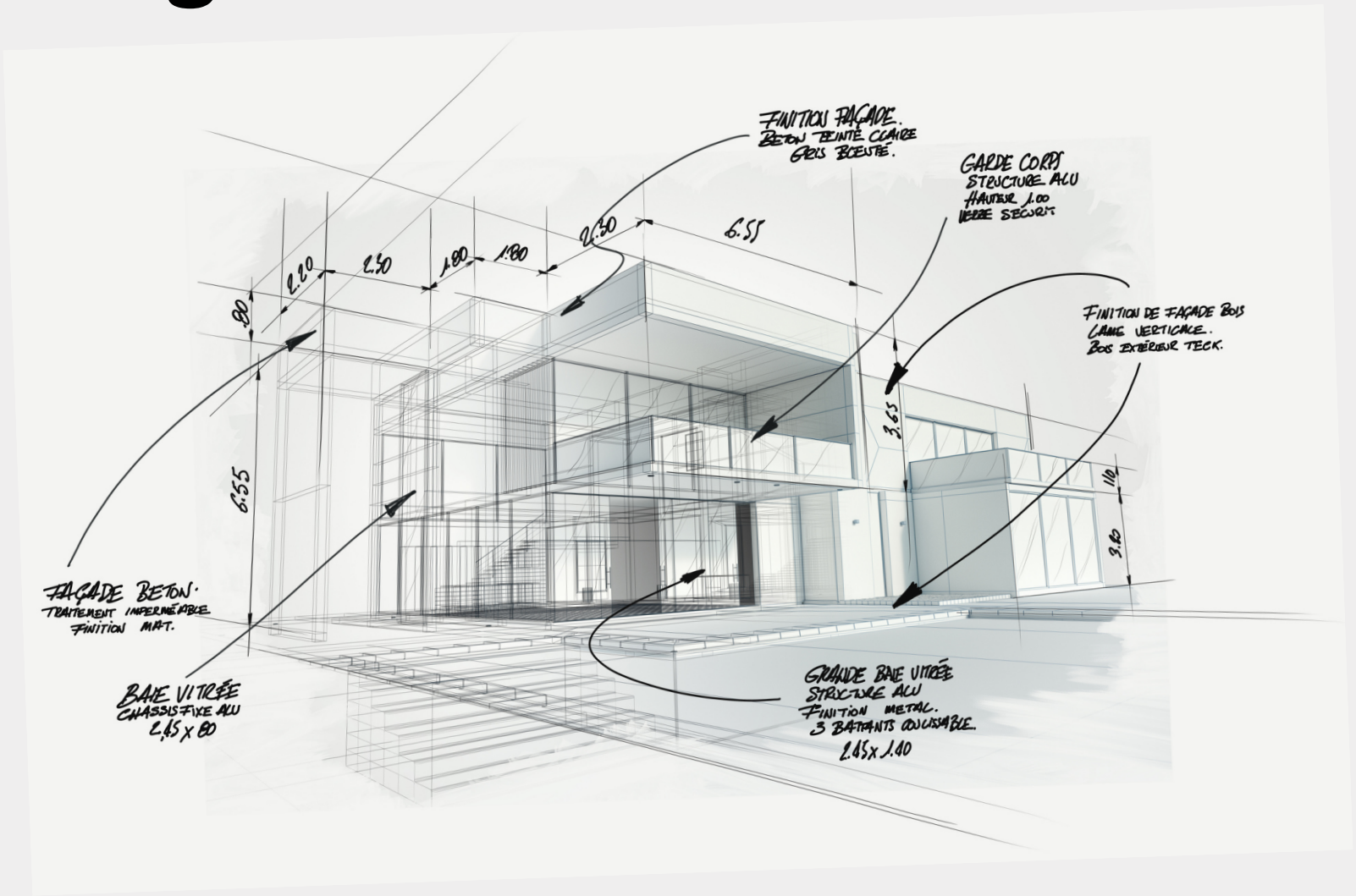
U.S. Office of Management and Budget, Circular A-4 (Sept. 2003)

Regulation is relational

Who tells **Who** to do **What** with what **Consequences?**



Design matters



Why Rule and Permit *Design*?

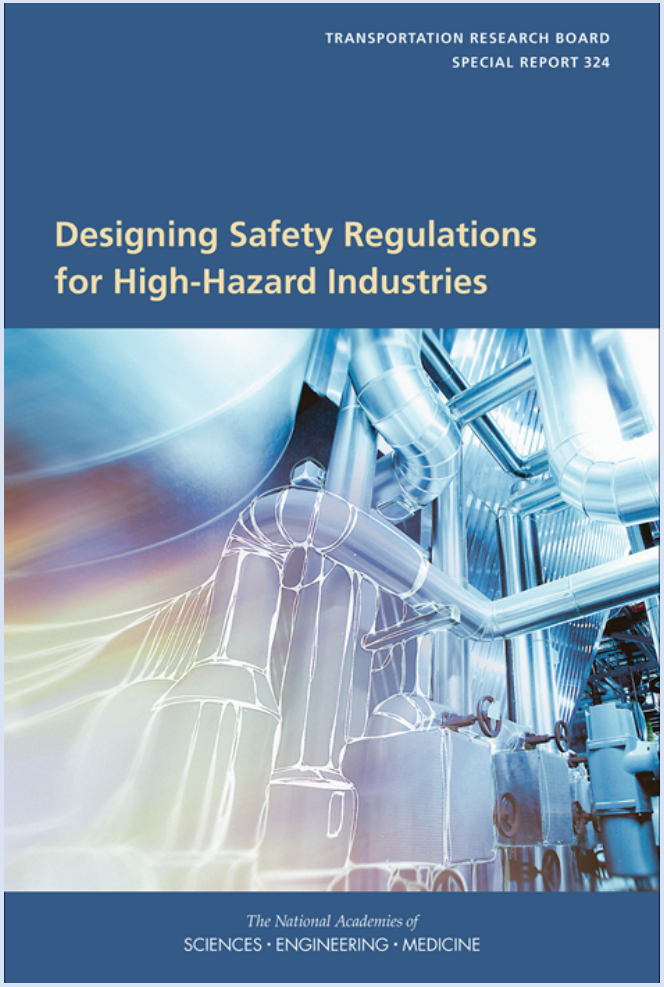
Different ways rules and permits are designed….

…can affect degree of **flexibility** afforded to regulated firms

…can require different types of **capacities** of regulated firms, small and large

…can call for different **capabilities** from the regulator to monitor and enforce

Ultimately, different designs yield different outcomes (benefits and costs)....



U.S. National Academy of Sciences Report on Rule Design (2018)

- Committee members from U.S., U.K., & Canada
  - From academe, industry, and NGO community
- Case studies of U.S. and Canadian pipelines, and U.S. and North Sea offshore energy development

“Richards (2000) summarizes dozens of classification schemes in the literature”

TABLE A2: SUMMARY OF INSTRUMENT CATEGORIES FROM SAMPLE OF ENVIRONMENTAL POLICY LITERATURE

Stahr (1971)
1. Product Standards
2. Production Process Standards
3. Taxes on Emissions
4. Subsidies for Pollution Control
5. Government Expenditure on Abatement Projects

Majone (1976)
1. Regulation, Direct Public Action, and Subsidies
2. Effluent Charges
3. Contract and Redefinition of Property Rights
4. Organization

Baumol and Oates (1979)
1. Moral Suasion
2. Direct Controls
   a. Regulation of levels of emissions
   b. Specification of processes or equipment
3. Market Processes
   a. Tax on environmental damage
      i. Rates based on damage
      ii. Rates designed to achieve preset environmental quality standard
   b. Subsidies
      i. Payments per unit of pollution reduction
      ii. Subsidies to defray equipment costs
   c. Marketable pollution licences
      i. Sale of licenses to highest bidder
      ii. Equal distribution of licenses
   d. Refundable deposits against environmental damage
   e. Allocation of property rights
4. Government Investment Facilities
   a. Regenerative facilities
   b. Dissemination of information
   c. Research
   d. Education

Bohm and Russell (1985)
1. Prices and Taxes
2. Tradeable Rights
3. Deposit-Refund Systems and Performance Bonds
4. Liability
5. Regulation
   a. Forcing private negotiation
   b. Performance standards
   c. Regulating decision variables correlated to emissions
   d. Design standards
   e. Bans on products or processes
6. Government Investment in Protection and Restoration
7. Moral Suasion

Bressers and Klok (1988)
1. Creating Alternatives (Technological Development)
2. Alternatives Reduction (Physical Intervention)
3. Changing Pros and Cons of Alternatives
4. Changing Valuation of Outcomes
5. Information Provision

Department of Energy (1989)
1. Regulation
   a. Regulation by controls
      i. Bans
      ii. Emissions controls
      iii. Input controls
      iv. Consumption controls
      v. Price controls
      vi. Rate of return regulation
   b. Standards
      i. Technology standards
      ii. Licensing and certification
2. Fiscal Incentives
   a. Emission fees
   b. Tradeable emission rights
   c. Deposit-refund systems
   d. Taxes
      i. Excise taxes
      ii. Taxes on firms
      iii. Personal income tax
      iv. Property taxes
      v. Tariffs
   e. Subsidies
   f. Direct government expenditure
      i. R&D support
      ii. Direct government purchases
3. Information
   a. Advertising and labeling
   b. Education
   c. Moral suasion
   d. Signaling
4. Research, Development, and Demonstration
   a. Public invention support programs
   b. Commercialization education
   c. Provision of specialized information
   d. Demonstrations

Hahn (1989)
1. Standards
   a. Ambient standards controlling environmental quality
   b. Emissions standards
      i. Technology-based standards
      ii. Performance standards
2. Subsidies
3. Taxes and Emissions Fees
4. Tradeable Permits

Environmental Protection Agency (1990)
1. Conventional Regulations
   a. Standards
   b. Use restrictions
   c. Product design
2. Market Incentives
   a. Pollution charges
   b. Permit systems
3. Scientific/Technical Measures (R&D)
4. Provision of Information
5. Enforcement
6. Cooperation with Other Government Agencies and Nations

Project 88C Round II (1991)*
1. Command-and-Control
   a. Technology-based standards
   b. Uniform performance standards
2. Market-Based Instruments
   a. Pollution charges
   b. Tradeable permits
   c. Deposit-refund systems
   d. Market barrier reductions
   e. Government-subsidy elimination

* Also similar: Project 88 (1988), Stavins (1992), Hahn and Stavins (1991, 1992), Stavins (1998)

Office of Technology Assessment (1995)
1. Direct Limitations
   a. Single-source tools
      i. Harm-based standards
      ii. Design standards
      iii. Technology specifications
      iv. Product bans and limits
   b. Multisource tools
      i. Integrated permitting
      ii. Tradeable emissions
      iii. Challenge regulations
2. Indirect Limitations
   a. Pollution charges
   b. Liability
   c. Information reporting
   d. Subsidies
   e. Technical assistance

Department of Energy (1996)
1. Information and Education
2. Voluntary Programs
3. Research, Development and Demonstration
4. Regulation
5. Market-Based Incentives

Callan and Thomas (1996)
1. Command-and-Control
   a. Technology-based standards
   b. Performance-based standards
2. Market-Based
   a. Pollution Charge
      i. Effluent charge
      ii. Product charge
      iii. User charge
      iv. Service charge
   b. Subsidy
   c. Deposit/Refund
   d. Pollution permit market
      i. Credit system
      ii. Allowance system

Intergovernmental Panel on Climate Change (1996)
1. Market-Based Programs
   a. Taxes
   b. Full-cost pricing
   c. Subsidies
   d. Phaseout of subsidies
   e. Tradeable emissions quotas
2. Voluntary Agreements
   a. Energy use and emissions standards
   b. Government procurement
   c. Promotional programs
3. Regulatory Measures
   a. Mandatory building or equipment standards
   b. Product and practices bans
   c. Nontradeable emissions quotas
4. Research, Development and Demonstration

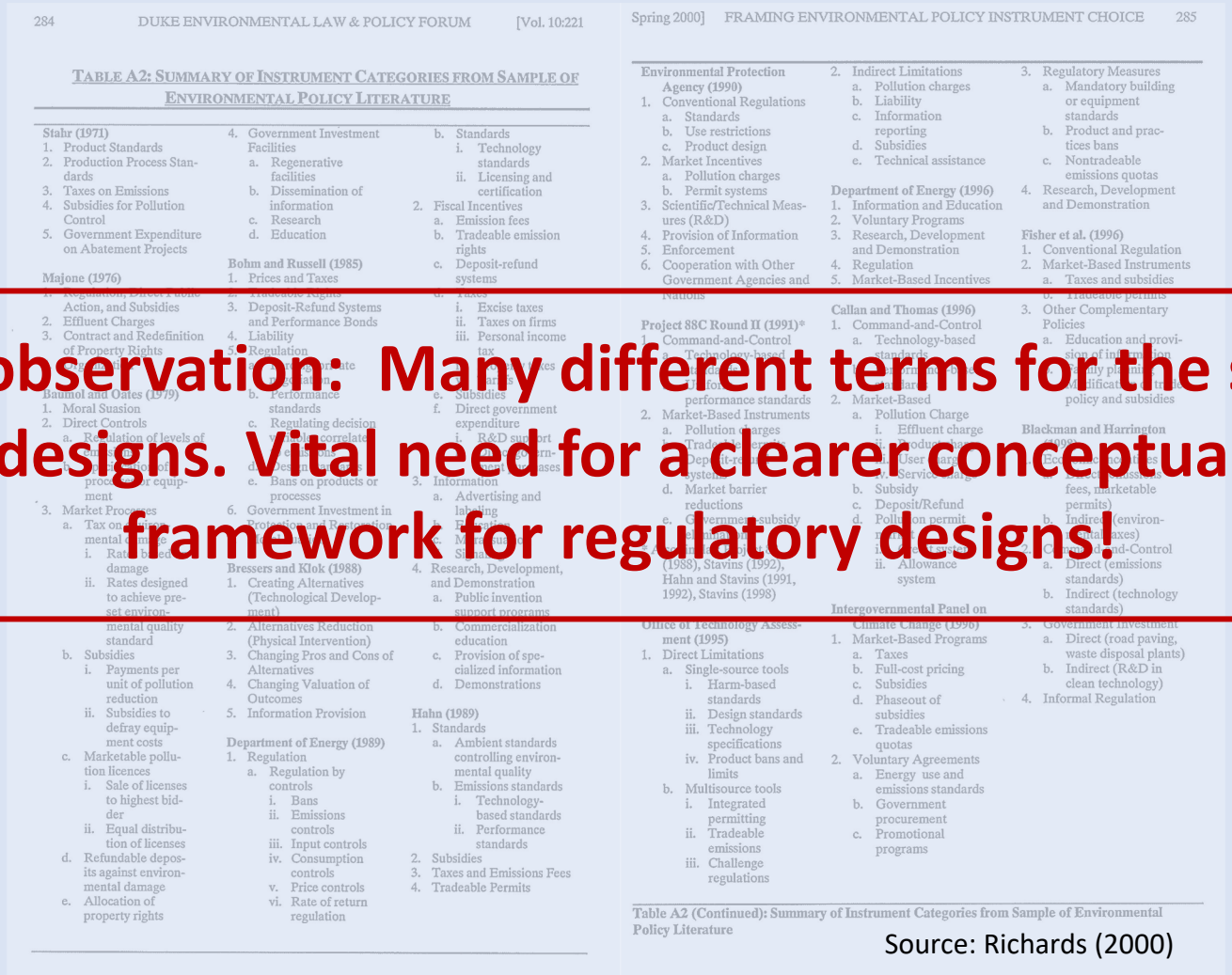
Fisher et al. (1996)
1. Conventional Regulation
2. Market-Based Instruments
   a. Taxes and subsidies
   b. Tradeable permits
3. Other Complementary Policies
   a. Education and provision of information
   b. Family planning
   c. Modification of trade policy and subsidies

Blackman and Harrington (1998)
1. Economic Incentives
   a. Direct (emissions fees, marketable permits)
   b. Indirect (environmental taxes)
2. Command-and-Control
   a. Direct (emissions standards)
   b. Indirect (technology standards)
3. Government Investment
   a. Direct (road paving, waste disposal plants)
   b. Indirect (R&D in clean technology)
4. Informal Regulation

Table A2 (Continued): Summary of Instrument Categories from Sample of Environmental Policy Literature

Source: Richards (2000)

“Richards (2000) summarizes dozens of classification schemes in the literature”



284 DUKE ENVIRONMENTAL LAW & POLICY FORUM [Vol. 10:221

TABLE A2: SUMMARY OF INSTRUMENT CATEGORIES FROM SAMPLE OF ENVIRONMENTAL POLICY LITERATURE

Stahr (1971)
1. Product Standards
2. Production Process Standards
3. Taxes on Emissions
4. Subsidies for Pollution Control
5. Government Expenditure on Abatement Projects

Majone (1976)
1. Regulation, Direct Public Action, and Subsidies
2. Effluent Charges
3. Contract and Redefinition of Property Rights

Baumol and Oates (1979)
1. Moral Suasion
2. Direct Controls
a. Regulation of levels of [illegible] or production processes or equipment
3. Market Processes
a. Tax on [illegible] mental damage
i. Rates based on damage
ii. Rates designed to achieve preset environmental quality standard
b. Subsidies
i. Payments per unit of pollution reduction
ii. Subsidies to defray equipment costs
c. Marketable pollution licences
i. Sale of licenses to highest bidder
ii. Equal distribution of licenses
d. Refundable deposits against environmental damage
e. Allocation of property rights
4. Government Investment Facilities
a. Regenerative facilities
b. Dissemination of information
c. Research
d. Education

Bohm and Russell (1985)
1. Prices and Taxes
2. Tradeable Rights
3. Deposit-Refund Systems and Performance Bonds
4. Liability
5. Regulation
a. Ambient standards
b. Performance standards
c. Regulating decision [illegible] correlates
d. [illegible]
e. Bans on products or processes
6. Government Investment in [illegible]

Bressers and Klok (1988)
1. Creating Alternatives (Technological Development)
2. Alternatives Reduction (Physical Intervention)
3. Changing Pros and Cons of Alternatives
4. Changing Valuation of Outcomes
5. Information Provision

Department of Energy (1989)
1. Regulation
a. Regulation by controls
i. Bans
ii. Emissions controls
iii. Input controls
iv. Consumption controls
v. Price controls
vi. Rate of return regulation
b. Standards
i. Technology standards
ii. Licensing and certification
2. Fiscal Incentives
a. Emission fees
b. Tradeable emission rights
c. Deposit-refund systems
d. [illegible]
i. Excise taxes
ii. Taxes on firms
iii. Personal income tax
e. Subsidies
f. Direct government expenditure
i. R&D support
ii. [illegible]
3. Information
a. Advertising and labeling
b. [illegible]
c. Moral Suasion
4. Research, Development, and Demonstration
a. Public invention support programs
b. Commercialization education
c. Provision of specialized information
d. Demonstrations

Hahn (1989)
1. Standards
a. Ambient standards controlling environmental quality
b. Emissions standards
i. Technology-based standards
ii. Performance standards
2. Subsidies
3. Taxes and Emissions Fees
4. Tradeable Permits

Spring 2000] FRAMING ENVIRONMENTAL POLICY INSTRUMENT CHOICE 285

Environmental Protection Agency (1990)
1. Conventional Regulations
a. Standards
b. Use restrictions
c. Product design
2. Market Incentives
a. Pollution charges
b. Permit systems
3. Scientific/Technical Measures (R&D)
4. Provision of Information
5. Enforcement
6. Cooperation with Other Government Agencies and Nations

Project 88C Round II (1991)*
1. Command-and-Control
a. Technology-based [illegible] performance standards
2. Market-Based Instruments
a. Pollution charges
b. Tradable [illegible] Deposit-refund systems
d. Market barrier reductions
e. Government subsidy [illegible] (1988), Stavins (1992), Hahn and Stavins (1991, 1992), Stavins (1998)

Office of Technology Assessment (1995)
1. Direct Limitations
a. Single-source tools
i. Harm-based standards
ii. Design standards
iii. Technology specifications
iv. Product bans and limits
b. Multisource tools
i. Integrated permitting
ii. Tradeable emissions
iii. Challenge regulations
2. Indirect Limitations
a. Pollution charges
b. Liability
c. Information reporting
d. Subsidies
e. Technical assistance

Department of Energy (1996)
1. Information and Education
2. Voluntary Programs
3. Research, Development and Demonstration
4. Regulation
5. Market-Based Incentives

Callan and Thomas (1996)
1. Command-and-Control
a. Technology-based [illegible]
2. Market-Based
a. Pollution Charge
i. Effluent charge
ii. [illegible] charge
iii. User charge
iv. Service charge
b. Subsidy
c. Deposit/Refund
d. Pollution permit [illegible]
ii. Allowance system

Intergovernmental Panel on Climate Change (1996)
1. Market-Based Programs
a. Taxes
b. Full-cost pricing
c. Subsidies
d. Phaseout of subsidies
e. Tradeable emissions quotas
2. Voluntary Agreements
a. Energy use and emissions standards
b. Government procurement
c. Promotional programs
3. Regulatory Measures
a. Mandatory building or equipment standards
b. Product and practices bans
c. Nontradeable emissions quotas
4. Research, Development and Demonstration

Fisher et al. (1996)
1. Conventional Regulation
2. Market-Based Instruments
a. Taxes and subsidies
b. Tradeable permits
3. Other Complementary Policies
a. Education and provision of information
b. [illegible] difficulties in [illegible] policy and subsidies

Blackman and Harrington (1999)
1. Economic Incentives
a. Pollution taxes
b. Subsidies (user fees, marketable permits)
b. Indirect (environmental taxes)
2. Command-and-Control
a. Direct (emissions standards)
b. Indirect (technology standards)
3. Government Investment
a. Direct (road paving, waste disposal plants)
b. Indirect (R&D in clean technology)
4. Informal Regulation

Table A2 (Continued): Summary of Instrument Categories from Sample of Environmental Policy Literature

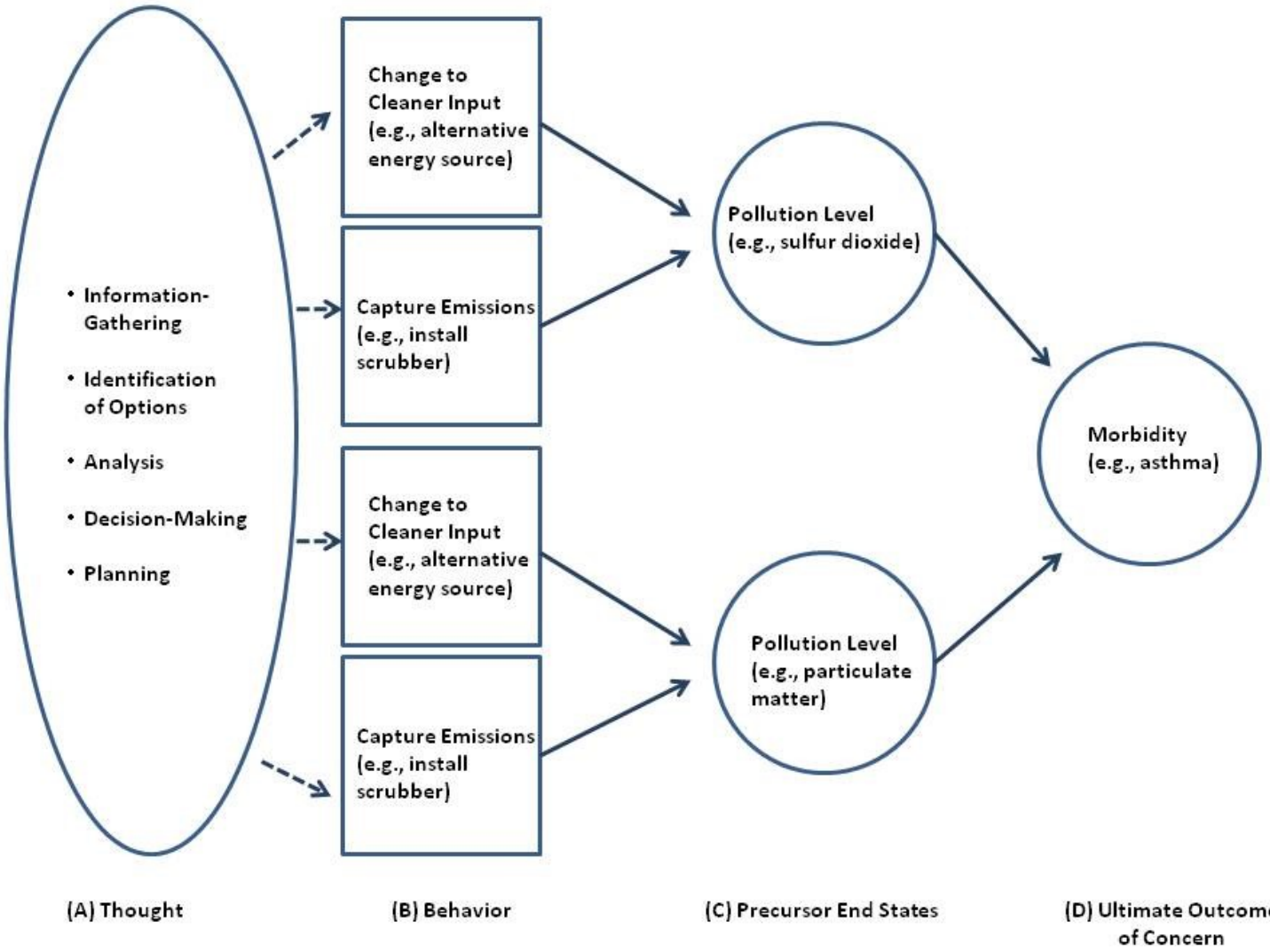
Key observation: Many different terms for the same designs. Vital need for a clearer conceptual framework for regulatory designs!

Source: Richards (2000)

Two Dimensions of Rule Design

- **Means versus Ends**
  - Means: "command that the regulated entity take or avoid an action"
  - Ends: "mandate the achievement or avoidance of certain ends"
- **Micro versus Macro**
  - Micro: "targeted to a specific contributor or causal pathway to the ultimate problem"
  - Macro: "focus is widened to the ultimate problem itself"

Causal Chains, Rule Design, and Flexibility



Source: Coglianese & Bennear (2012)

A Rule Design Framework

	Means	Ends
Micro	**Micro-means "Prescriptive"**	**Micro-ends "Performance-based"**
Macro	**Macro-means "Management-based"**	**Macro-ends "General duty/liability"**

Source: Adapted from Coglianese (2010)

	Means	Ends
Micro	Micro-means "Prescriptive"	Micro-ends "Performance-based"
Macro	Macro-means "Management-based"	Macro-ends "General duty/liability"

Micro-Means

"Prescriptive"

Mandated actions aimed at points on a causal pathway to the ultimate problem

Examples:

- "Install a hazard warning sign having a certain color scheme"
- "Install a particular type of valve"
- "Inspect the condition of equipment at a defined time interval"
- "Construct a pipeline by using a specified grade of steel"

Pros and Cons:
Micro-Means ("Prescriptive") Regulations

PROS

- "may be easier to follow by regulated firms"
- "may be easier to enforce, for ... same reason"

CONS

- "may result in less effective or less cost-effective methods of addressing risk ... because one size does not always fit all"
- "may not afford regulated entities room to change"

	Means	Ends
Micro	Micro-means "Prescriptive"	Micro-ends "Performance-based"
Macro	Macro-means "Management-based"	Macro-ends "General duty/liability"

Micro-Ends

"Performance-based"

Mandated outputs at points on a causal pathway leading to the ultimate problem

Examples:

- "Ensure that an electrical component of a product passes a test for shock resistance"
- "Limit sulfur dioxide emissions to certain levels"
- "Demonstrate the capability to evacuate all occupants from a building in a designated time"

Pros and Cons:
Micro-Ends ("Performance-based") Regulations

PROS

- "may allow more flexibility by different firms"
- "may allow greater opportunities for firms to innovate"

CONS

- "may be difficult for the regulator to monitor"
- "may foster a 'teaching to the test' effect or encourage gaming"

	Means	Ends
Micro	Micro-means "Prescriptive"	Micro-ends "Performance-based"
Macro	Macro-means "Management-based"	Macro-ends "General duty/liability"

Macro-Means

"Management-Based"

Mandated actions aimed to induce managers to focus on the ultimate problem

Examples:

- "Engage in threat and risk analysis"
- "Establish and execute a safety management program"
- "Reevaluate and revise safety management plan at regular intervals"

Pros and Cons:
Macro-Means ("Management-based") Regulations

PROS

- "may allow for flexibility and opportunities for innovation"
- "may be used when outcomes are difficult to measure"
- "may help infuse a sense of responsibility, accountability, or safety culture"

CONS

- "both the firm and the regulator may need to develop new skills to implement ... the regulation effectively"
- "regulator may have difficulty in monitoring and ... in maintaining motivation for continuous improvement"
- may present challenges for smaller firms

	Means	Ends
Micro	Micro-means "Prescriptive"	Micro-ends "Performance-based"
Macro	Macro-means "Management-based"	Macro-ends "General duty/liability"

Macro-Ends

"General duty/liability"

Mandated outcomes that avoid the ultimate problem

Examples:

- "Keep workplace free from recognized hazards"
- "Design and maintain a facility to prevent releases of hazardous substances"
- "Conduct certain observations or measurements"
- "Avoid a transportation accident"

Pros and Cons:
Macro-Ends ("General Duty/Liability") Regulations

PROS

- "may provide flexibility and opportunities for innovation"
- "may reinforce other types of regulatory designs as a backstop"

CONS

- "may not adequately prevent harms since regulatory consequences are only imposed after an event"
- "may not provide adequate direction to firms that lack knowledge of what to do or lack the incentives to find out"

A Rule Design Framework

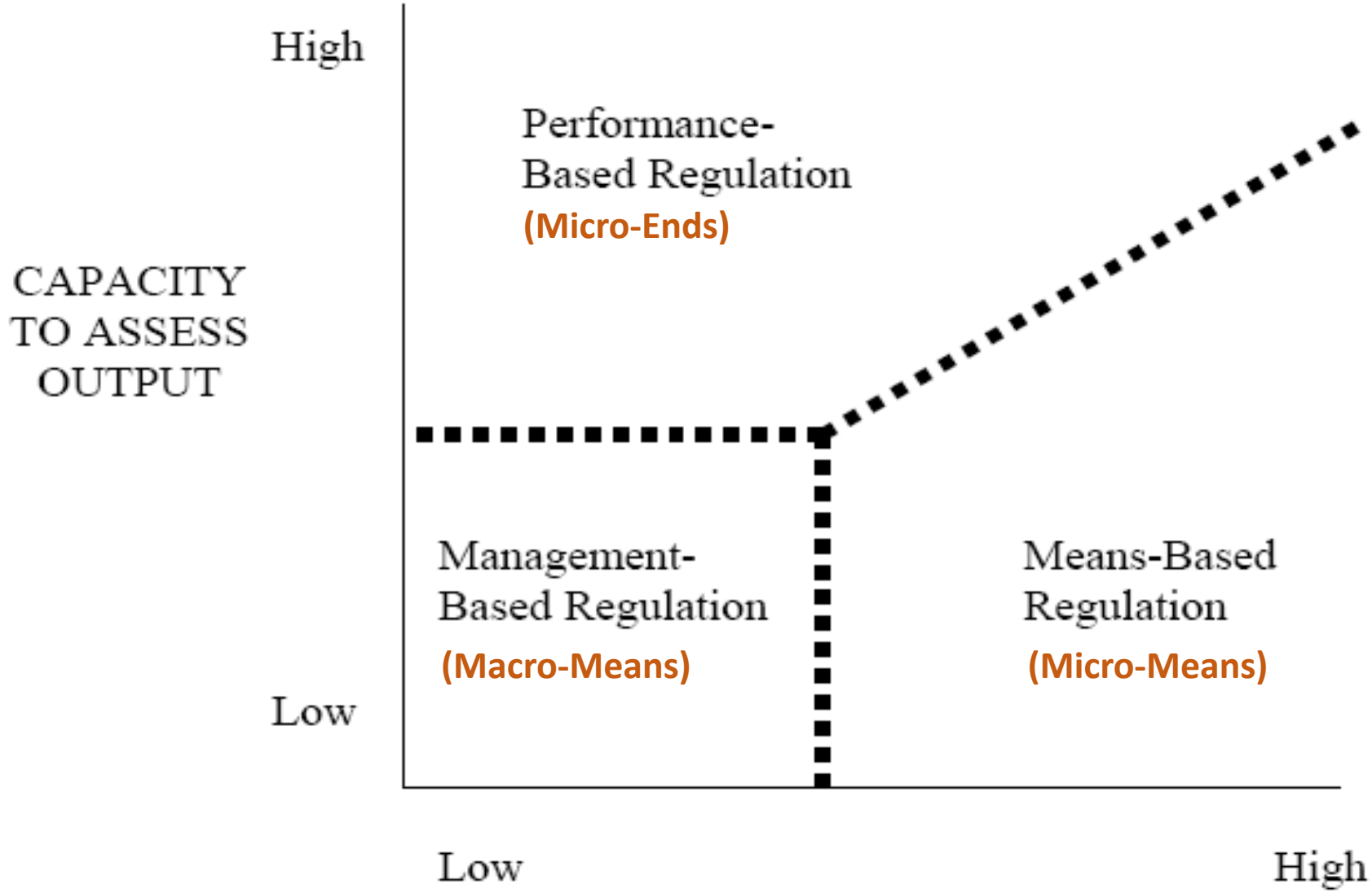
	Means	Ends
Micro	**Micro-means "Prescriptive"**	**Micro-ends "Performance-based"**
Macro	**Macro-means "Management-based"**	**Macro-ends "General duty/liability"**

Source: Adapted from Coglianese (2010)

Three Key Observations

Observation #1

1. *"The purported advantages and disadvantages of each design are **relative** to the other designs"*



Coglianese & Lazer (2003)

Observation #2

1. *"The purported advantages and disadvantages of each design are **relative** to the other designs"*

2. *"The regulator's task is to determine how well different designs or combinations of designs will work **under the constraints and conditions** encountered in practice"*

Key Constraints and Conditions

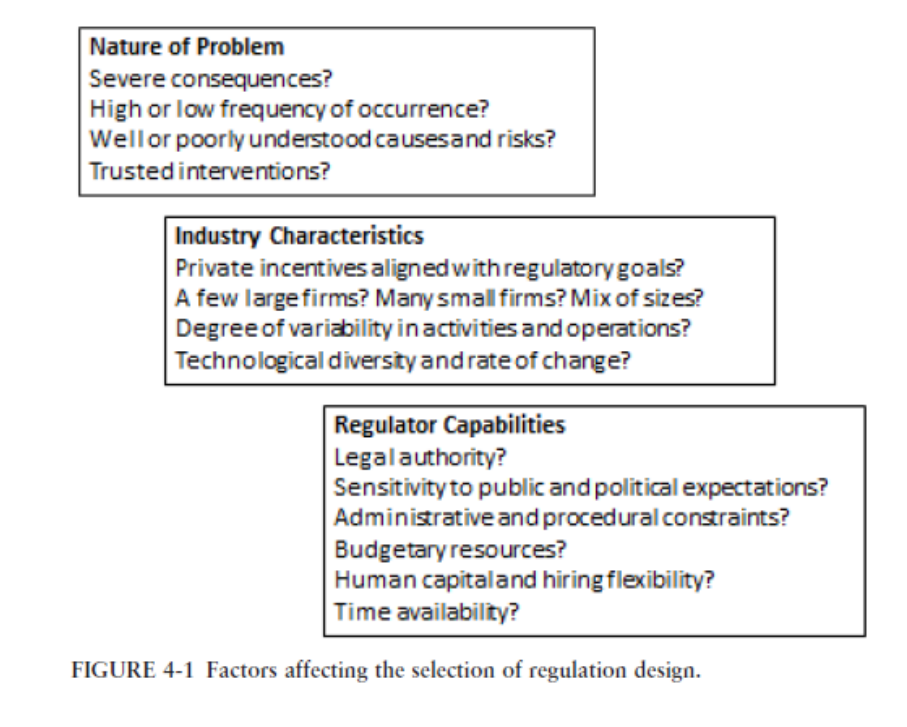


FIGURE 4-1 Factors affecting the selection of regulation design.

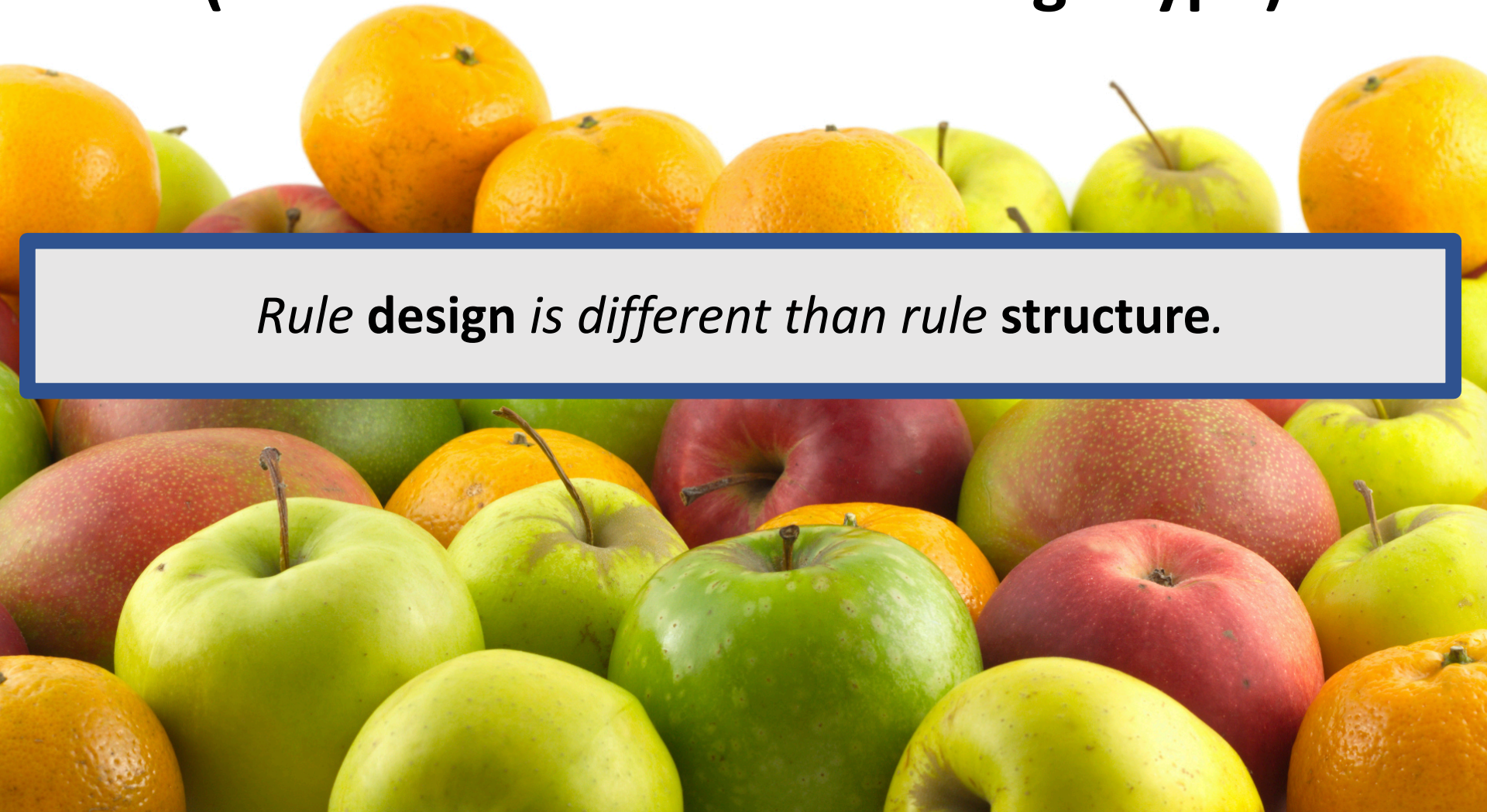
Figure Source: NAS report; based on Coglianese 2010

- **The Problem** (and its causal pathway)
- **The Industry** (and its incentives and characteristics)
- **The Regulator** (and its capabilities)

Observation #3

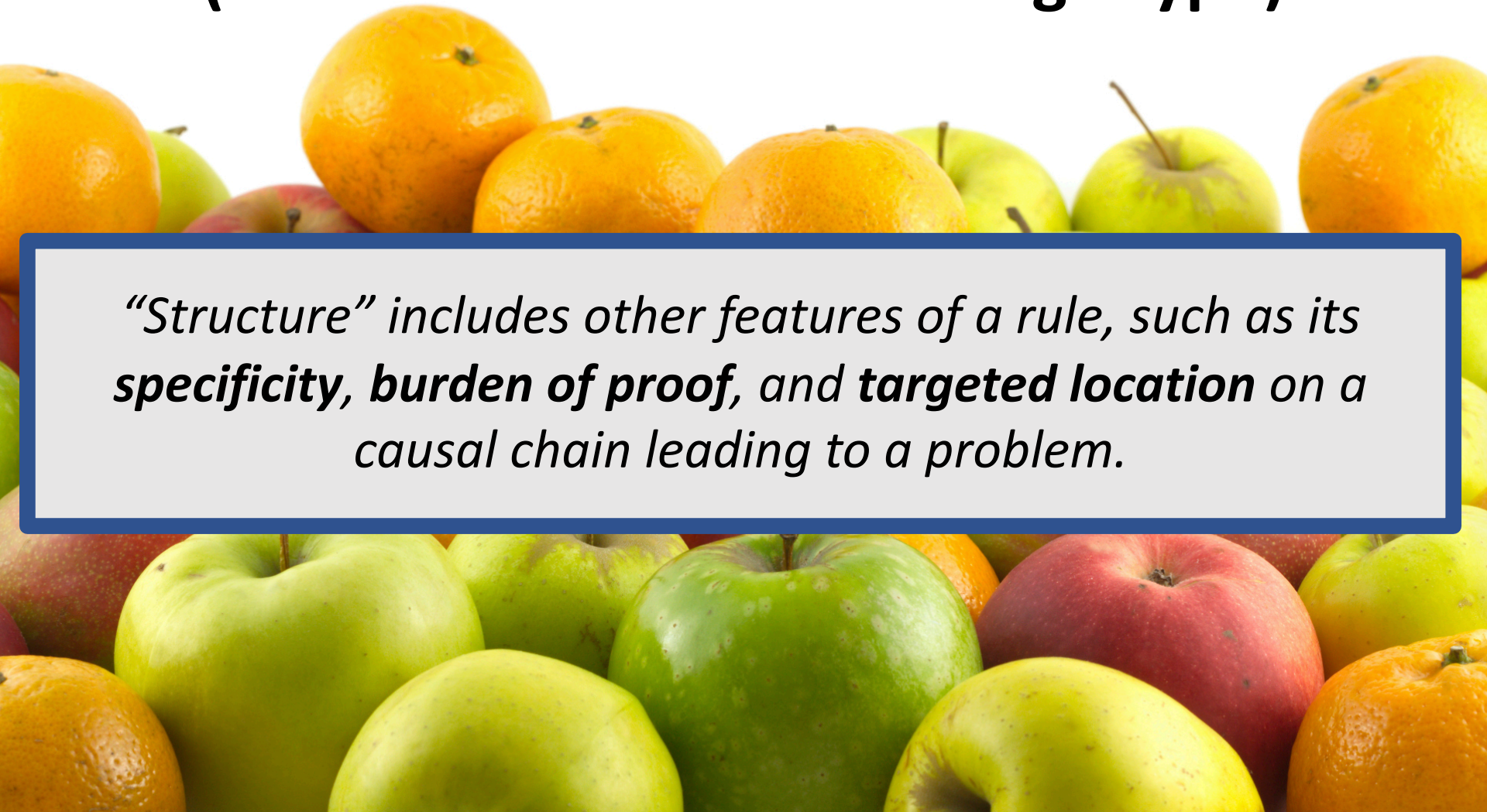
1. *"The purported advantages and disadvantages of each design are **relative** to the other designs"*
2. *"The regulator's task is to determine how well different designs or combinations of designs will work **under the constraints and conditions** encountered in practice"*
3. *"A regulation's advantages and disadvantages will **depend on how it is structured**"*

Not All Rules are the Same (even within the same design type)



Rule **design** *is different than rule* **structure**.

Not All Rules are the Same (even within the same design type)



"Structure" includes other features of a rule, such as its ***specificity***, ***burden of proof***, *and* ***targeted location*** *on a causal chain leading to a problem.*

Example 1: Ways that the Structure of Macro-Means ("Management-based") Rules Can Vary

1. Require just planning, or planning & implementation, etc.
2. Level of specificity or precision in MBR criteria
3. Role of regulator in planning: e.g., pre-approval?
4. Transparency: e.g., record-keeping
5. Extent to which they overlay or are supplemented with other types of regulation.

Example 2: Ways that the Structure of Micro-Ends ("Performance-based") Rules Can Vary

- Specificity (*loose vs. tight*)
- Proximity between legal command and regulatory goal (*close vs. distant*)
- How performance is determined (*measured vs. predicted*)
- Basis for the standard (*ideal vs. feasible*)
- Unit of analysis (*individual vs. aggregate*)
- Burden of Proof (*regulator vs. regulated*)

Enthusiasm for Micro-Ends (Performance-Based) Rules

- "The use of performance-based regulation is rapidly developing in OECD countries" (OECD 2002)
- Regulatory agencies should "specify performance objectives rather than specifying the behavior or manner of compliance" (U.S. executive orders 12,866, 13,563)

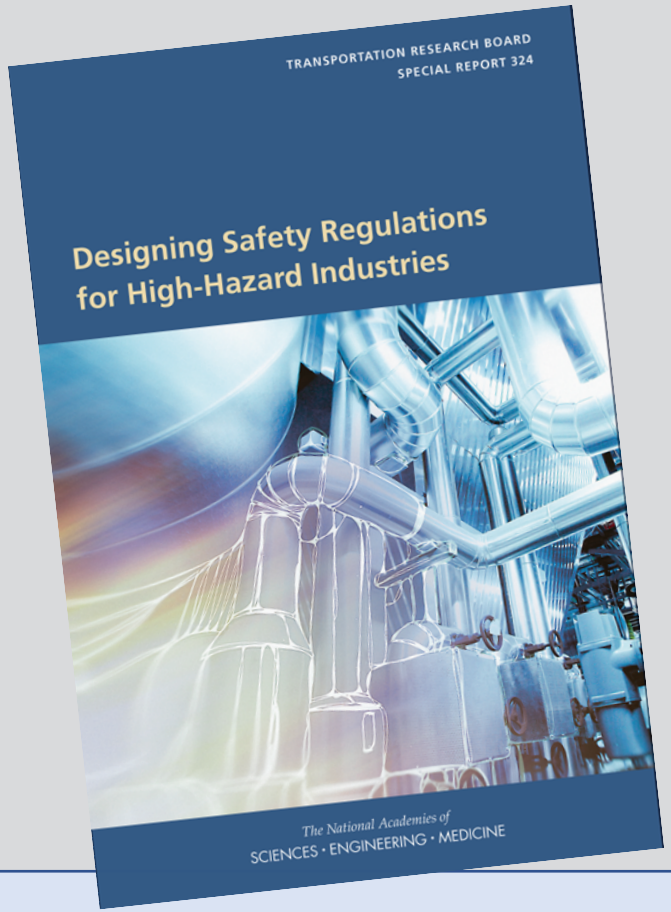
Claims of Micro-Ends (Performance Standards) Advantage

They are "generally superior to engineering or design standards because performance standards give the regulated parties the flexibility to achieve regulatory objectives in the most cost-effective way."

U.S. OMB Circular A-4

Performance Standards' Limits

- They do not necessarily *encourage* innovation
- They do not necessarily decrease regulatory complexity or "red tape"
- They can still significantly *limit* flexibility and opportunities for innovation (esp. if very stringent)



"If in a particular context a required end can only be achieved in one way at the present time, an ends-based regulation will be no different from a means-based regulation in terms of the flexibility offered."

Performance Standards' Limits

- **Tunnel vision**
  - Example: Child-resistant packaging is also adult-resistant
  - Example: Air bags that meet test for average-sized male can kill smaller adults and children
- **Teaching to the test**
  - Example: EPA heavy duty diesel engine regulation could be complied with, yet without reducing emissions very much

Think Carefully About Rule Design

"Regulators wanting to create more flexible regulation not only need to consider ***different ways of designing regulation***, but they also need to understand the (often complex) ***causal chains*** that link the behavior of the individuals and organizations they regulate to the social and economic problems they seek to solve."

The Regulatory Review

A Publication of the Penn Program on Regulation

Subscribe to Updates

Your Email

Business Education Environment Health Infrastructure International Process Rights Technology

Opinion | Process | Jul 30, 2012

Is Flexible Regulation an Oxymoron?

Cary Coglianese

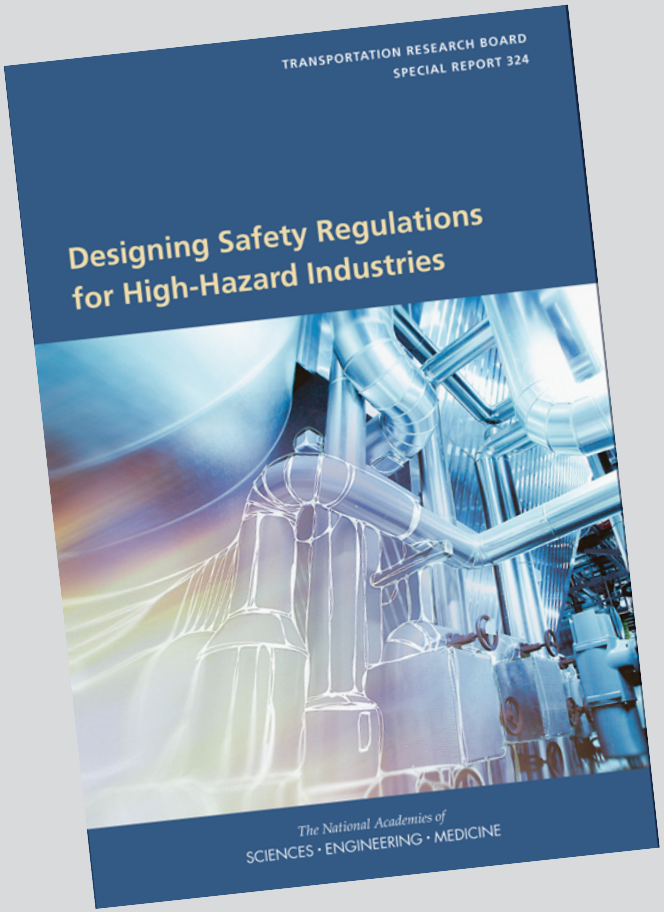
Font Size: − +

Regulatory flexibility makes sense only when comparing rules' stringency, structure, specificity, and scope.

"Flexible regulation" might sound like an oxymoron, but it has actually become a widely accepted catch phrase for a pragmatic approach to regulation. The phrase stakes out a middle ground between regulation's defenders and its critics, promising the achievement of important health, safety, and environmental objectives while also minimizing costs and preserving liberty. For over thirty years, the ideal of "regulatory flexibility" has been embedded in federal law in the United States, with legislation requiring administrative agencies "to solicit and consider flexible regulatory proposals" when contemplating new requirements that would affect small businesses. Early last year, President Obama adopted a more general order to agencies to pursue "flexible approaches" whenever "relevant, feasible, and consistent with regulatory objectives, and to the extent permitted by law." Agencies are now required to "identify and consider regulatory approaches that reduce burdens and maintain flexibility and freedom of choice for the public."

But does the idea of flexible regulation make sense? After all, flexibility implies choice, while regulation is all about constraint. Flexible regulation can make some sense, but only if flexibility is considered in relative terms. Even though regulation does inherently limit choice, not every regulation limits it to the same degree or in the same way. Two different regulations addressing the

Consider different designs for different pathways, even for the same problem



"[R]egulatory regimes often contain a mix of regulatory design types, rather than a single type…."

Rules (and their design types) may need to change over time

"[W]hatever form regulation itself may take, regulators must … acquire the **vision to notice change** as it is evolving, possess the **early-warning data** to anticipate seismic shifts in the larger landscape, and inculcate the independent-mindedness to **take appropriate action** when needed."

Coglianese, "Innovation and Regulatory Vigilance" (2018)

Conclusions

- Avoid simplistic or abstract advantages and disadvantages of types of regulations.
- The challenge for the regulator will be to choose a **design** and **structure** it in a way that is suited to the
  - **nature of the problem,**
  - **the characteristics of the regulated industry**, and the
  - **regulator's capacity** to promote and enforce compliance.
- Regulators should consider whether the best approach to achieving their regulatory goals may be to combine various regulatory approaches.
- Conditions change, regulatory vigilance is essential.

Selected Additional Publications on Regulatory Design

Cary Coglianese, "The Limits of Performance-Based Regulation," *University of Michigan Journal of Law Reform* 50:525-563 (2017)

Cary Coglianese, *Listening, Learning & Leading: A Framework of Regulatory Excellence* (2015)

Cary Coglianese & Lori Bennear, "Flexible Approaches to Environmental Regulation," in Michael Kraft and Sheldon Kamieniecki, eds., *The Oxford Handbook of U.S. Environmental Policy* (2012)

Cary Coglianese, "Management-Based Regulation: Implications for Public Policy," in Gregory Bounds and Nikolai Malyshev, eds., *Risk and Regulatory Policy: Improving the Governance of Risk* (OECD Publishing, 2010)

Cary Coglianese, Adam Finkel, & David Zaring, *Import Safety: Regulatory Governance in the Global Economy* (University of Pennsylvania Press, 2009)

Cary Coglianese & Jennifer Nash, eds., *Leveraging the Private Sector: Management-Based Strategies for Improving Environmental Performance* (Johns Hopkins University Press/Resources for the Future Press, 2006)

Cary Coglianese, Jennifer Nash, & Todd Olmstead, "Performance-Based Regulation: Prospects and Limitations in Health, Safety, and Environmental Regulation," *Administrative Law Review* 55: 705-729 (2003)

Cary Coglianese & David Lazer, "Management-Based Regulation: Prescribing Private Management to Achieve Public Goals," *Law & Society Review* 37: 691-730 (2003)

Kenneth Richards, "Framing Environmental Policy Instrument Choice," *Duke Environmental Law and Policy Forum*, 10: 221-285 (2000)

Questions and Discussion

For further information

Download the full NAS report at
https://www.nap.edu/download/24907

See also
Cary Coglianese and Thomas R. Menzies, Designing Safety Regulations for High-Hazard Industries, *The Regulatory Review* (Oct. 4, 2017), https://www.theregreview.org/2017/10/04/coglianese-menzies-safety-regulations-hazard-industries/

Contact Information:
Cary Coglianese, cary_coglianese@law.upenn.edu

PENN PROGRAM ON REGULATION

PENN PROGRAM ON REGULATION
UNIVERSITY OF PENNSYLVANIA
WWW.PENNREG.ORG
WWW.THEREGREVIEW.ORG