Utilities, networks, and the regulatory compact: an institutional perspective

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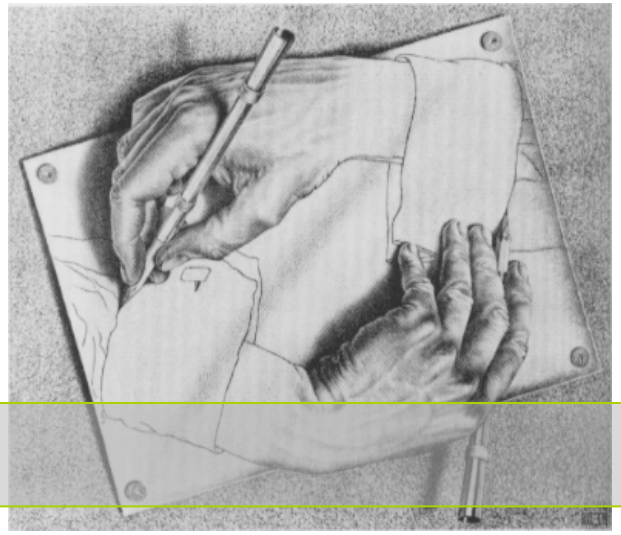
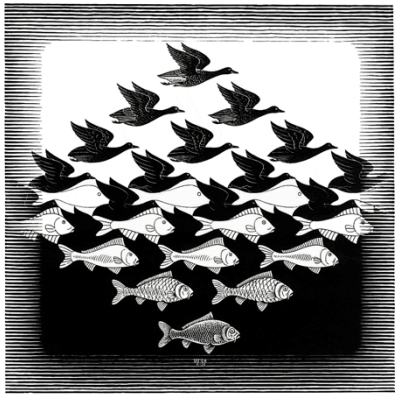


MICHIGAN STATE UNIVERSITY

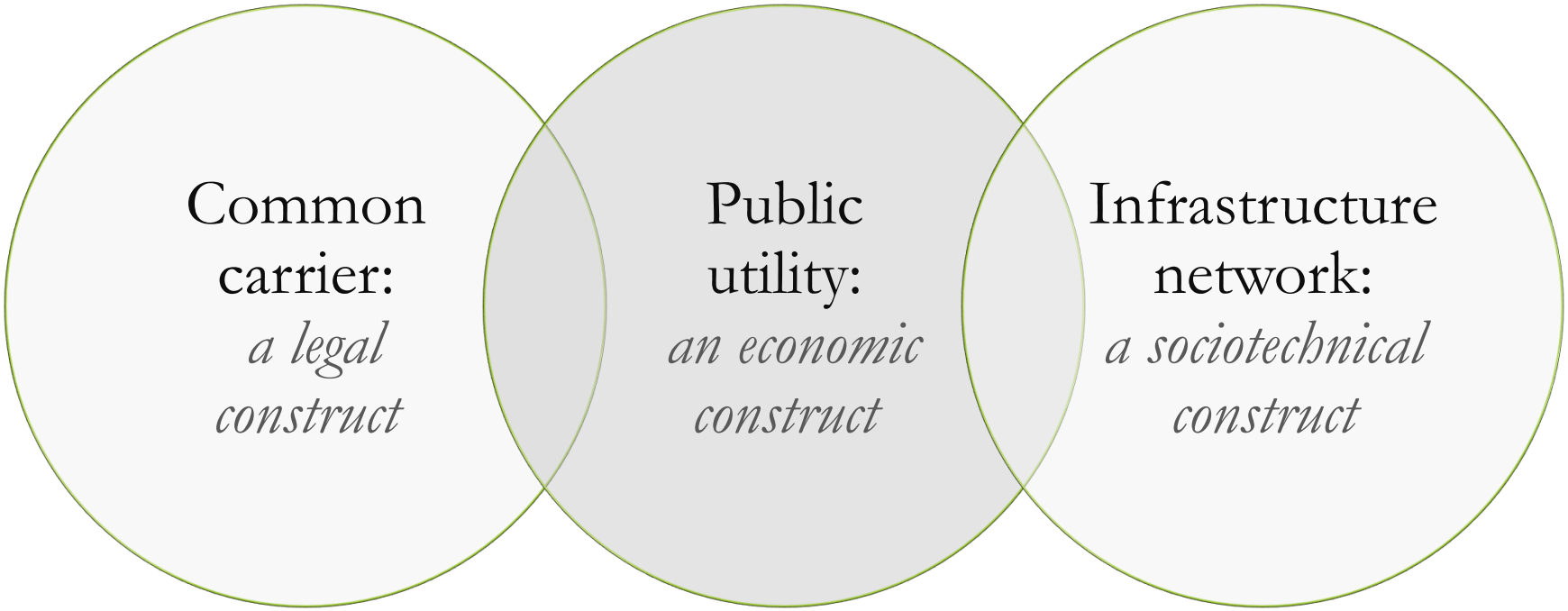
Overview



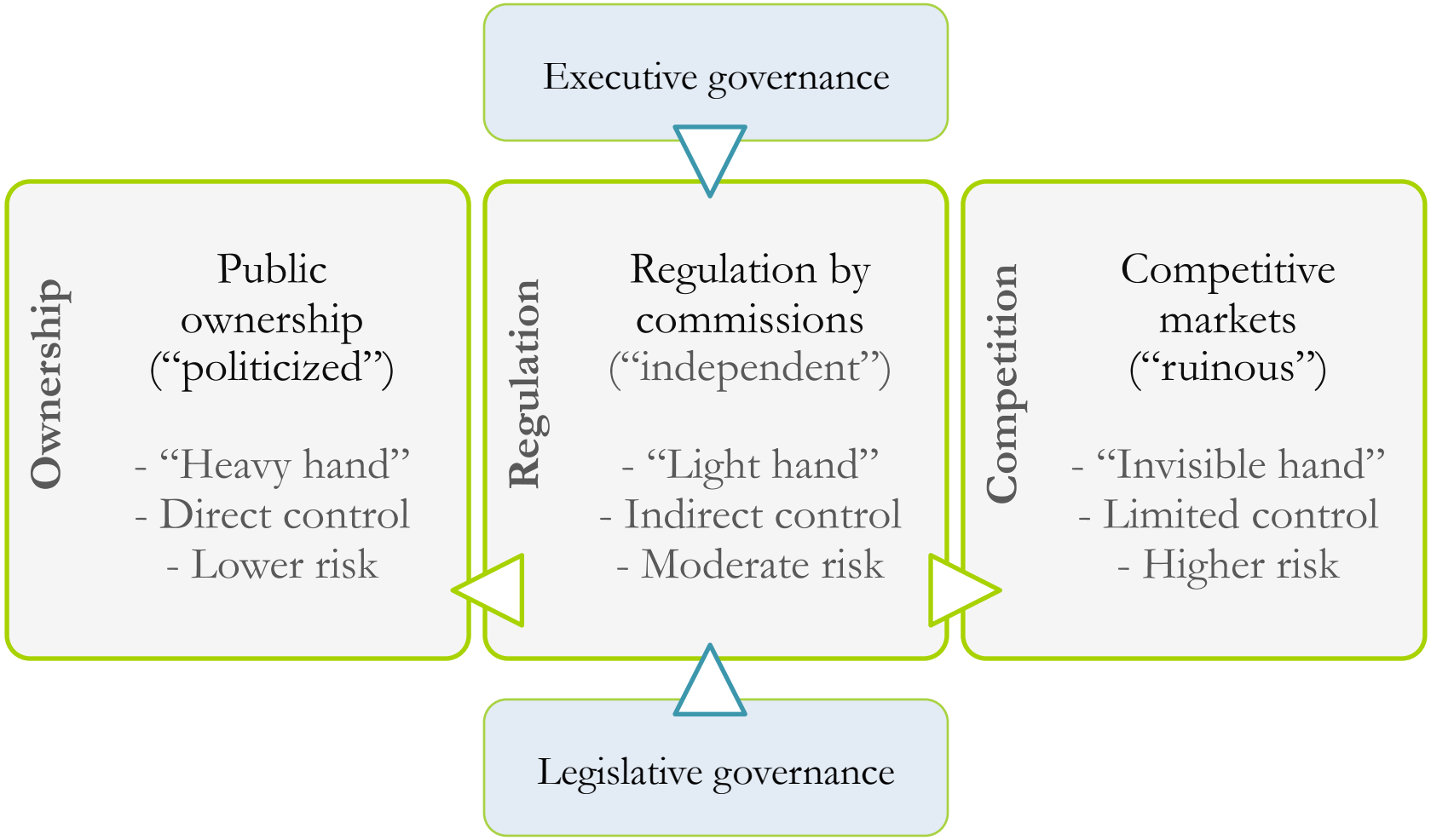
- Traditional utilities are defined by market failure in the form of monopoly, calling for economic regulation
- The operating paradigm for U.S. economic regulation centers on the construct of a social or regulatory "compact" (or "contract")
- Origins can be traced from ancient philosophy, to British common law, to American regulatory jurisprudence
- The compact provides a clear framework for allocating risks between utility investors and utility ratepayers
- The compact is undermined by excessive adaptation and activism that shifts risks away from utility shareholders
- If and when requisite conditions no longer apply, the compact (in theory) can be dissolved
- Given the essential nature of utility services, other policy institutions and instruments would be needed
- Whether public utilities and economic regulation face existential threats from remains to be seen

Origins of the compact

Carriers, utilities, and networks



Regulation as historical political compromise



Case law on utilities as servants of the state

- "A railroad is a public highway, and nonetheless so because constructed and maintained through the agency of a corporation deriving its existence and powers from the state. Such a corporation was created for public purposes. It performs a function of the state," *(Smyth v. Ames, 169 U.S. 466 (1898).*
- The investor's "company is the substitute for the state in the performance of the public service, thus becoming a public servant," (Justice Brandeis concurring in *Southwestern Bell v. Mo. PSC, 1923).*
- A utility franchise is "a special privilege" that is "granted or withheld at the pleasure of the state" and "the Federal Constitution imposes no limits upon the state's discretion in this respect," *(Frost v. Corp. Commission of Oklahoma, 1929).*
- "[T]he true principle is that the state's power extends to every regulation of any business reasonably required and appropriate for the public protection…" (Justice Brandeis dissenting in *New York State Ice Co., 1932).*
- "[A] State is free to adopt whatever economic policy may reasonably be deemed to promote public welfare…[certain services] so nearly touch the vital economic interests of society that no additional clothing with a public interest is needed to justify the regulation… this is evidently true of all business units supplying transportation, light, heat, power and water…" *(Nebbia v. New York, 1934).*
- "[P]rice must be used to reconcile the private property right society has permitted to vest in an important natural resource with the claims of society upon it…" (*FPC v. Hope Natural Gas, 1944).*

Regulatory paradigm: requisite conditions and institutions

Market failure is manifested by *monopoly* of essential utility services		
Legal: private property rights & carrier compensation	*Economic:* utility scale, capital intensity, & longevity	*Social:* network effects, accessibility, and controls

Regulation serves *the public interest* by promoting efficiency as well as equity		
Common carriage doctrine	Principled social compact	Independent governance

Regulation provides a functional *proxy for competitive markets or direct state control*		
Standards for performance	Risk and reward incentives	Mechanisms of accountability

Utility rights and obligations under the regulatory compact

Rights: The utility enjoys

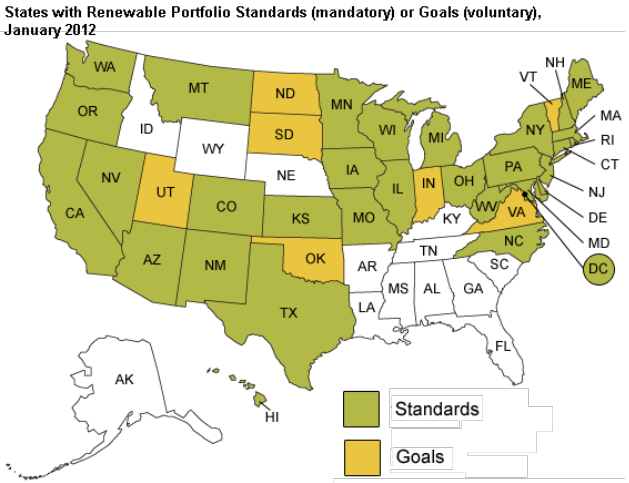
- A conditional exclusive franchise for a certificated service territory, rights of eminent domain, protection from direct competition and antitrust, recovery of allowed costs through rates and charges, and a reasonable opportunity to earn a fair return on prudent and useful investment.

Obligations: The utility accepts

- An obligation to provide all paying customers with access to safe, adequate, reliable, convenient, and nondiscriminatory service on just and reasonable terms, while assuming certain business and market risks and consenting to comprehensive regulatory oversight.

Terms specified under the compact

- Regulatory compact is a living agreement between the state and the utility
  - Regulator is an arm of the state for implementation and enforcement of utility as agent
- Potential terms and conditions imposed by the state for social purposes
  - Universal access and service
  - Energy resource portfolios
  - Energy efficiency and demand response
  - Operational standards
  - Public and worker safety
  - Service quality and enforcement
  - Capacity utilization and reserves
  - Economic development
  - Consumer education and information
  - Security, reliability, and resilience



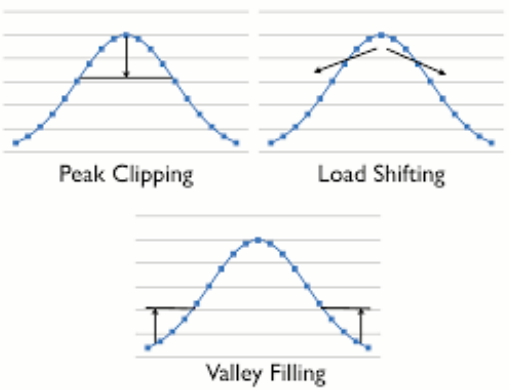
- Meeting the terms warrants just compensation
  - Failure to meet conditions implies forfeiture of the voluntary franchise
  - A "new prudence" can be defined based on contemporary goals and adaptive technologies
- Dissolving the compact
  - Divestment of property, disruption of technology, or "disintegration" of network
  - Deregulation relinquishes state regulatory authority over these terms to the market or other policy institutions

Compact as a living agreement

- Regulation should provide enough stability for investment while retaining enough risk to promote efficiency and innovation
  - Stability comes from continuity in processes and methods not certainty (absolute predictability) of outcomes
  - Regulation should not be arbitrary *(Duquesne),* capricious, confiscatory, or expropriate
- Compact is institutionally grounded in legislation and precedent – but not fixed
  - Structures and procedures are relatively constant but deliberations are dynamic
  - Sets out a path but can be adapted to new goals, conditions, and technologies
  - Conceptions of prudence must evolve with knowledge, technologies, and preferences
- Institutional framework v. binding contracts
  - Contracts attempt to anticipate a wide scope of uncertainty
  - Institutions are flexible and contend with change by design
  - Regulators cannot bind future regulators
- Utilities interact with regulators on an ongoing basis
  - Financial reports, audits, and prudence reviews
  - Rate cases, cost reconciliation proceedings, and settlements (subject to approval)
  - Planning and certificates of public convenience and necessity (CPCN)

A new paradigm or a new prudence?

- Legal standard for prudence based on "known and knowable" remains core
- Rather than a new paradigm, regulation can advance a new prudence for modern network industries
  - Clear performance standards and expectations (targets)
  - Compensation and incentives based on policy outcomes
  - Specified terms for revisiting prior decisions
- Modern prudence can promote
  - Capital optimization and operational efficiency
  - Load management and capacity utilization
  - Information, cost, and risk management
  - System reliability, public safety, and service quality
  - Flexible, adaptive, and resilient infrastructure design
- Flexible design under dynamic supply and demand conditions
  - Flexible engineering design (R. de Neufville , MIT)
  - NextGen Infrastructures (TU Delft): F.R.A.M.E.
    - Flexible, reliable, available, maintainable, economic



Requisite conditions for dissolving the compact

Legal: private property rights and carrier compensation

Divestment
based on alternative structures and governance (e.g., public, cooperative, franchise)

Economic: utility scale, capital intensity, and longevity

Disruption
based on economic alternative service-delivery technologies (e.g., self-supply, energy storage)

Social: network effects, accessibility, and controls

Disintegration
based on alternative preferences and policies (e.g., service levels and obligations)

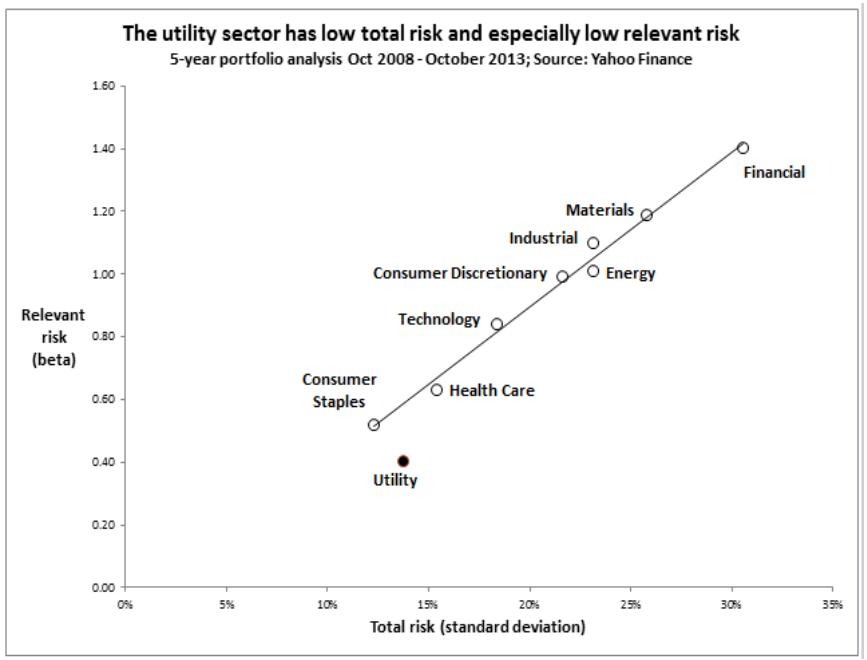
Evaluating dissolution

- Dissolving the compact
  - If all three requisite conditions are not met, the compact can be dissolved and other institutions can take its place as necessary to fulfill policy goals
- Divestment
  - Private cost test: comparison of options based on private, public, and nonprofit investment and operational models
- Disruption
  - Direct cost test: comparison of options based on costs of alternative technologies of different scale (technological and structural)
- Disintegration
  - Social cost test: comparison of options accounting for all public and private costs, including positive and negative externalities, network effects, and opportunity costs

Risk and change

Risk and the compact

- Utility investors enter the regulatory compact voluntarily (by choice)
- Regulated utilities present a unique risk profile in the political economy
- U.S. utility culture has become very risk sensitive if not risk averse
- Risk management involves avoiding, mitigating, or (often) shifting risks
- Regulators should be "risk aware" *as much to maintain as to mitigate risk*



Path to profit

- Compact provides "path to profit" but does not guarantee returns
  - Utilities are entitled only to a "reasonable opportunity to earn a fair return"
  - Investments must be "prudent" and "used and useful" to ratepayers
  - Utilities are ensured a return of and on investment but not investment itself (ratebase)
  - Certificates (CPCN) recognize need but expenditures are still subject to review
- Role of standards
  - Ratemaking methods are guided by well-established standards
  - Regulation cannot be arbitrary and capricious and is subject to judicial review
  - Regulators operate within a zone of reasonableness and may make pragmatic adjustments - gradualism, grandfathering, consideration of consumer sentiment and community values
- New entrants (non-utilities) seek cost recovery and revenues assurances too
  - Contracts, leases, and purchase agreements
  - Without constraints of regulated returns

Case law on risk

- Regulation involves the "fair interpretation of a bargain" that finds a "midway" between too little and too much profit *(Cedar Rapids, 1912)*.
- Regulation does not ensure that businesses will produce "net revenues" or recover losses *(FPC v. Nat. Gas Pipeline, 1942)*.
- Returns should reflect "corresponding risk" to maintain credit and attract capital while assuming "efficient and economical management" and balancing "wealth and welfare," *(Bluefield Water v. WV PSC, 1923; FPC v. Hope Nat. Gas, 1944)*
- Due process does not insure or protect utilities from losses due to business risk associated with "economic forces" *(Market St. Railway, 1945)*.
- A contract rate may be evaluated relative to the public interest but is not "'unjust' or 'unreasonable' simply because it is unprofitable," *(FPC v. Sierra Pacific, 1956)*.
- Utility monopolies are "relatively immune to the usual market risks," so risk is largely defined by rate methodologies and these should not arbitrarily shift risks to and from investors *(Duquesne Light v. Barasch, 1989)*.

Role of fair returns

- The "fair" return is designed to promote socially beneficial investment and economic progress

Regulatory consideration of policy	^	Excessive or extortive return	An economically inefficient return
	^	Incentive or bonus return	A return with a premium to motivate desired performance
	^	**Fair return**	**A return with a premium to motivate beneficial investment**
Regulatory consideration of risk	^	Compensatory return	A return based on the cost of equity including an equity-risk premium
	^	Risk-free return	A return based on the yield on risk-free securities*
	^	Confiscatory return	A return below the cost of capital (unconstitutional taking)**

* Government-owned and not-for-profit utilities are generally insulated from equity risk.
** For an investor-owned utility that still faces equity risk, any return below the cost of equity would be considered confiscatory.
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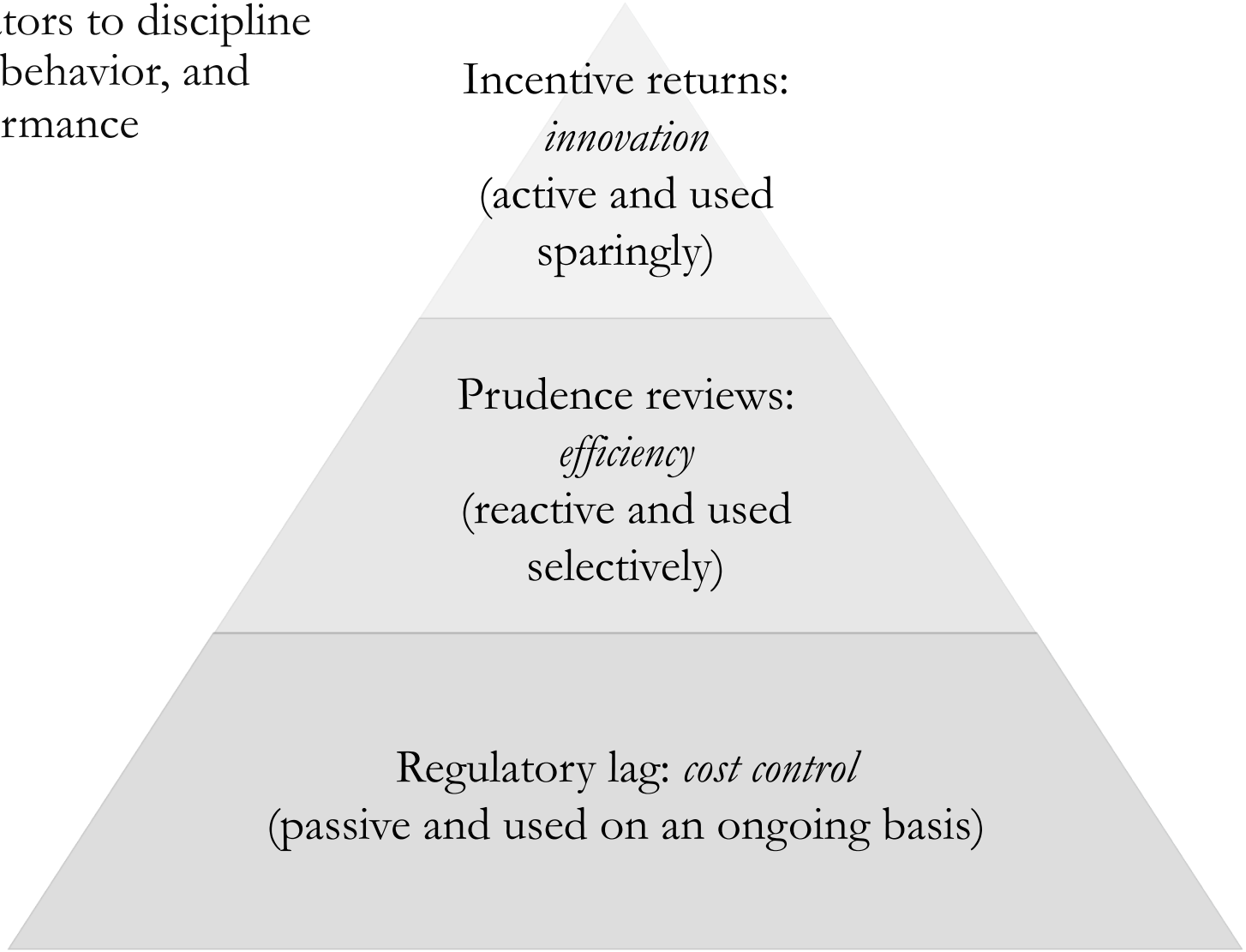
Three risk-based incentive tools used by regulators

- Used by regulators to discipline utilities, shape behavior, and motivate performance



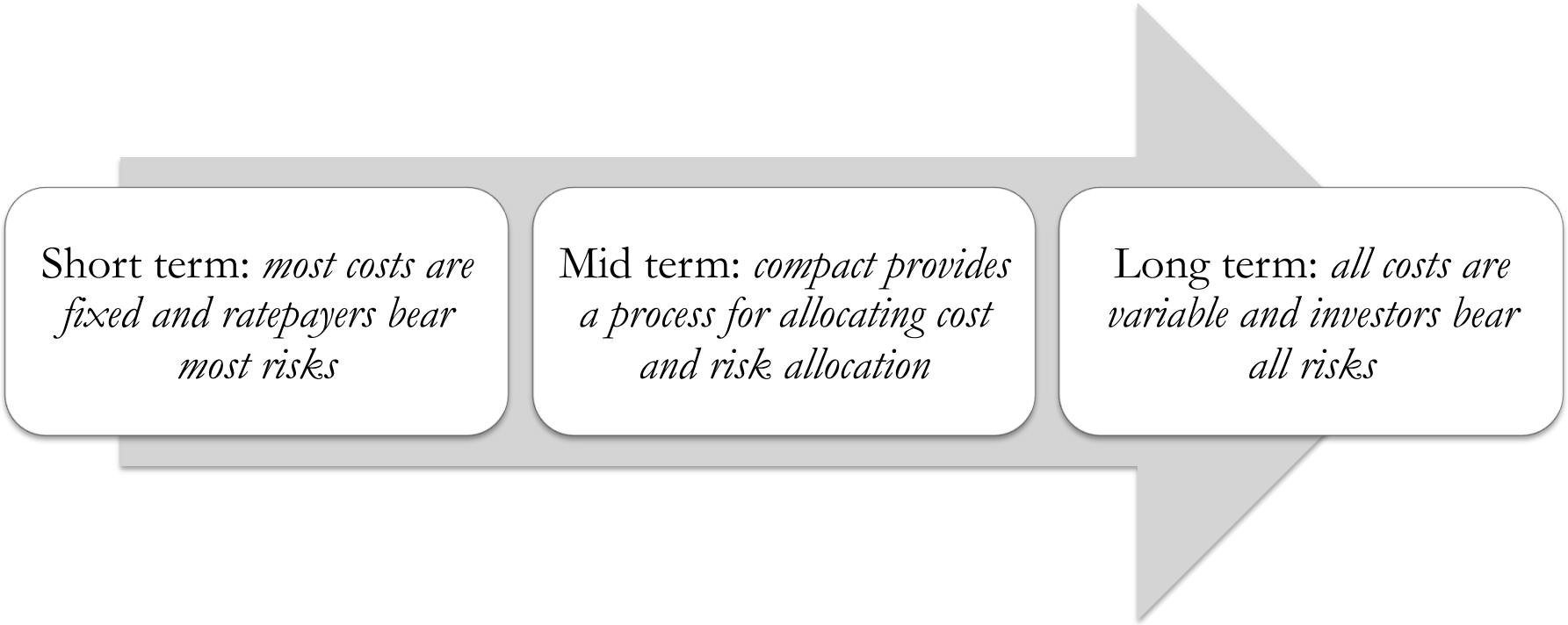
Three regulatory incentive tools (continued)

- Regulatory lag in cost recovery is part of the regulatory paradigm by design
  - Much maligned and blunt but purposive in maintaining short-term risk
  - Multi-year price or revenue caps formalize lag by extending the rate term (see P. Joskow)
  - Returns are also a function of "utility lag" (i.e., failures of cost forecasting, timely filing)
  - "Best practices" and "constructive environments" tend to shift risks to ratepayers
  - Use of mechanisms to reduce lag call for adjusting allowed returns
- Prudent performance is expected and earns a fair return only (no bonuses)
  - "[T]he practical purpose of income is to serve as a guide for prudent conduct" ("Hicksian income," John Hicks)
  - "In principle at least, the short run prudence test is no different from the short run efficiency test imposed by competitive markets," (P. Joskow and R. Schmalensee)
  - Prudence reviews counteract investment incentives (AJ effect) under the RB/ROR
- Incentive returns can be used strategically but sparingly to motivate innovation
  - Focus on performance v. specifying means of achievement
  - Utilities do not enjoy the fruits of efficiency or innovation for very long because regulators "expropriate" or "claw back" the rewards – but neither do competitive firms (see e. Bailey, 1974)

Death spiral for utilities

Timeframes under the compact

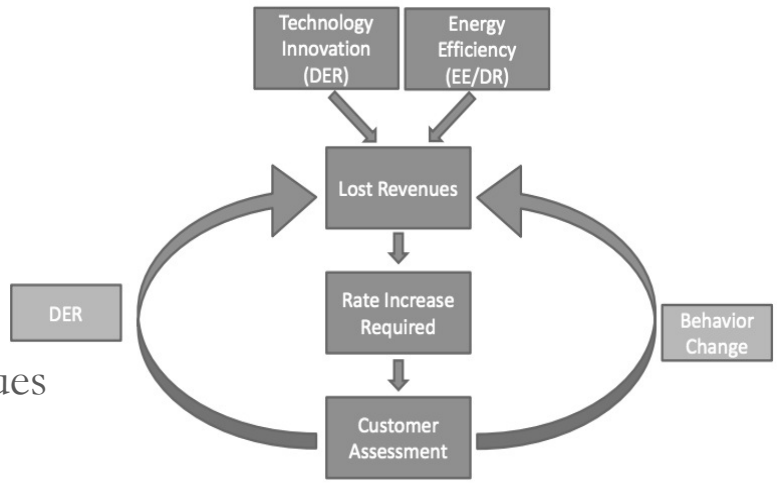
- As long as utility networks serve social purposes, costs must be covered
  - In the short term, utilities have a constitutional right to compensation
  - In the long term, the compact does not protect utilities from broad market forces and consumer sovereignty or guarantee survival of any technology, company, business model
  - In the mid term, the regulatory process is used to allocate costs and risks according to established standards and methods (including transitions, entry, and exit) – where regulator determination of risks and burdens takes place



Existential threats to utilities and regulation

- "Death spiral" based on loss of load and revenues
  - End-use efficiency requires cost recovery over fewer units (rising prices)
  - Rising costs of central supply make bypass and self-supply attractive (solar, water recycling)
  - Adverse selection (exclusion) effect as healthiest leave the pool, drive up cost for remaining
- Actual displacement will depend on trends in
  - Availability and price of reasonable alternatives
  - Technological advancement and productivity
  - Price and income elasticities of demand
  - Opportunity costs to customers
  - Public policies and subsidies (tax and regulatory)
- Time frame matters
  - Short-term loss of load and associated sales revenues
  - Mid-term excess capacity and stranded investment
  - Long-term loss of capital investment opportunity
- Utilities must face a dynamic equilibrium
  - Network must continue to provide value at reasonable prices
  - In the long run, regulation does not protect utilities from broad market forces and consumer sovereignty *(Market St. Railway, 1945)*

Exhibit 3
Vicious Cycle from Disruptive Forces



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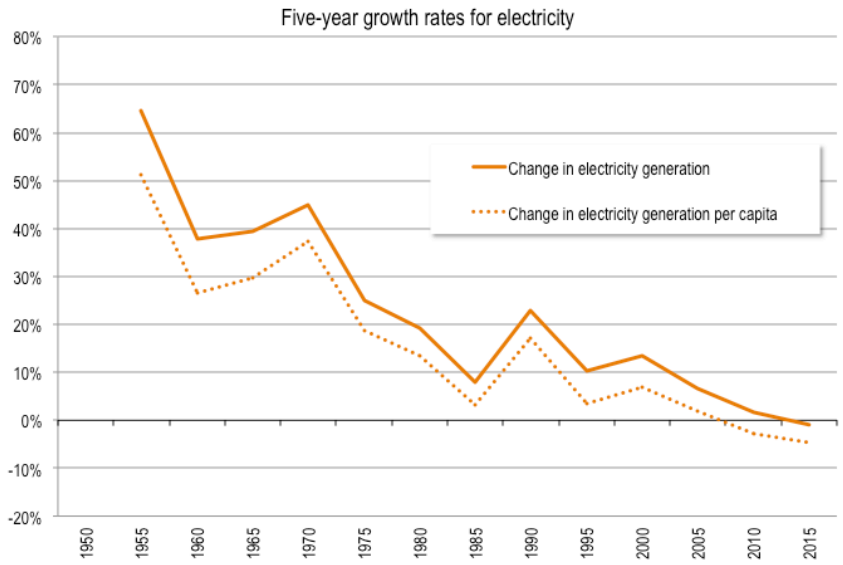
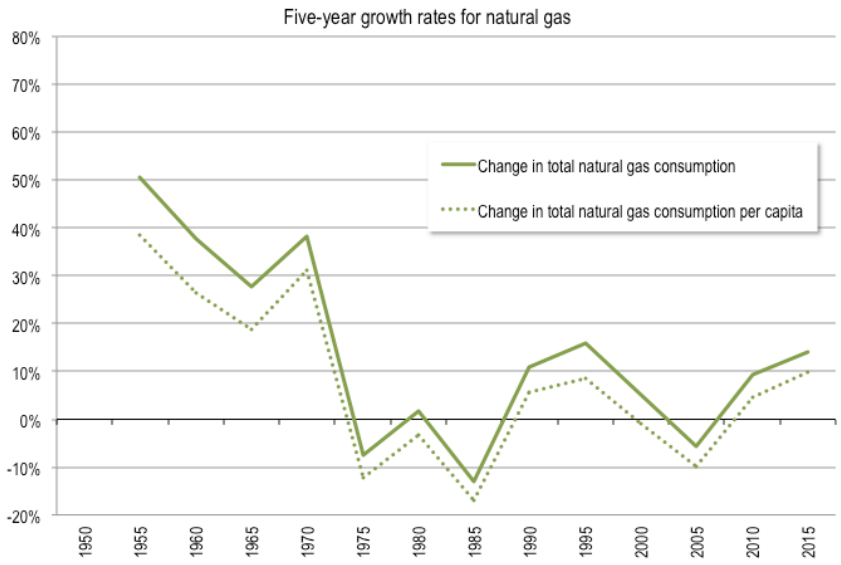
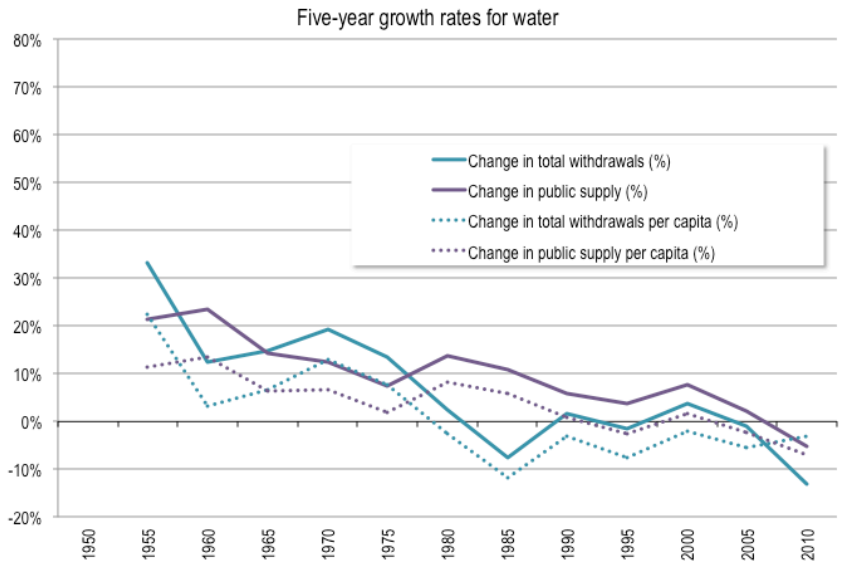
Aggregate industry growth trends





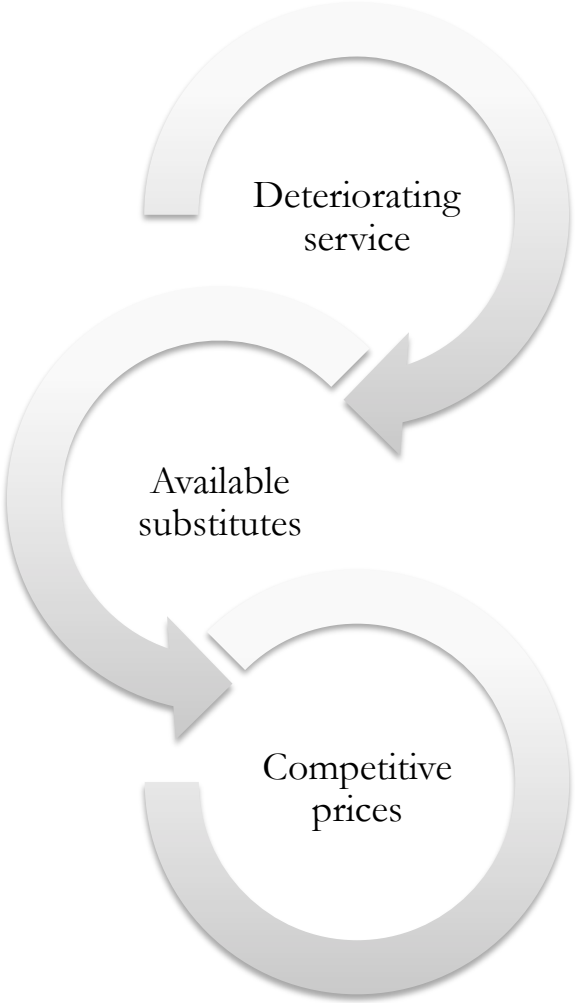


Case law on lost value

- "The public cannot properly be subjected to unreasonable rates in order simply that stockholders may earn dividends… If a corporation cannot maintain such a highway and earn dividends for stockholders, it is a misfortune for it and them which the Constitution does not require to be remedied by imposing unjust burdens upon the public," *(Covington & Lexington Turnpike v. Sandford, 1896)*.
- What the company is entitled to ask is a fair return upon the value of that which it employs for the public convenience, and on the other hand, what the public is entitled to demand is that no more be exacted from it for the use of a public highway than the services rendered by it are reasonably worth," *(Smyth v. Ames, 1898)*.
- "Regulation does not insure that the business shall produce net revenues, nor does the Constitution require that the losses of the business in one year shall be restored from future earnings by the device of capitalizing the losses and adding them to the rate base on which a fair return and depreciation allowance are to be earned," *(FPC v. Nat. Gas Pipeline, 1942)*.
- "The fixing of prices, like other applications of the police power, may reduce the value of the property which is being regulated. But the fact that the value is reduced does not mean that the regulation is invalid… And he who would upset the rate order under the Act carries the heavy burden of making a convincing showing that it is invalid because it is unjust and unreasonable in its consequences," *(FPC v. Hope Nat. Gas, 1944)*.

Anatomy of a death spiral: *Market St. Railway (1945)*

- Competition is normally expected to drive prices down
  - In the wake of rising costs and falling demand, utilities want price protection - particularly higher fixed costs and decoupling
  - Higher prices in turn affect competitiveness
- Market St. decision (1945) holds that no regulated price that consumers would pay could cover costs and sustain operations
  - Rate regulators cannot act as a taxing agency to redistribute wealth
  - Factors contributing to the railroad's demise: deteriorating service, available substitutes, competitive prices, and price elasticity
  - "Even monopolies must sell their services in a market where there is competition for the consumer's dollar and the price of a commodity affects its demand and use."



Regulatory treatment of transition costs (K. Rose, 1996)

- Problem of stranded cost was prominent with restructuring (1990s)
- Compact provides no guarantees for total cost recovery
- Allowing for transition costs thwarts dynamic efficiency & impairs competition
  - Blunts utility incentives to lower costs and mitigate transition costs.
  - Creates an asymmetry between utility risk and reward (no downside)
  - Acts as a barrier to entry and exit
- Recommends a performance-based approach
  - Price caps and profit sharing
- If recovery of transition costs is allowed
  - Do not commit to the amount of the transition costs in advance
  - Place a time limit on when recovery will be allowed
  - No recovery should be allowed for avoidable operating costs or for return on investment
  - Link recovery of transition costs with the level of risk the utility is taking
  - If possible. do not allow full recovery
  - The burden of proof for verification of costs should be on the utility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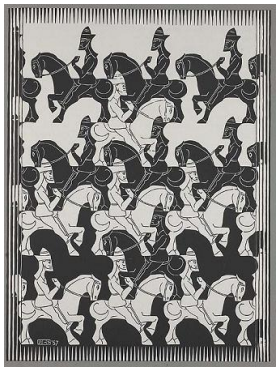
By Ivan Penn

Institutional implications

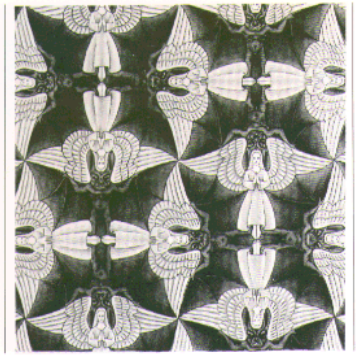
- Risk drives efficiency and innovation for all firms
  - Regulation can be a tough substitute for competition by maintaining risk
  - Risk and reward are why private investors participate in the utility sector
  - Utilities generally have more risk-management capacity than their ratepayers
  - Guard against weakening the compact with respect to risk and responsibility
- When regulators favor technologies, choose business models, and/or manage market transitions they assume risks
  - Risks are not reduced but shifted to ratepayers (or "socialized")
  - Regulation becomes an administrative v. a judicial process
  - Utilities become an arm of the state (suggestive of public ownership)
  - Reducing risk to investors is counterproductive if it stifles innovation
  - Large-volume customers exercising "choice" could e asked to pay exit fees



Adaptation and activism

Adaptation of the compact

- Critics believe regulation is a stagnant, unresponsive, non-adaptive institution
  - In reality, regulation has been proven to be demonstrably sentient and adaptive
  - Regulatory networks play a role in regulatory adaptation and policy diffusion
- Some academic literature on adaptive and responsive regulation
  - Adaptive: regulation as a complex system
  - Flexible: regulation as discretionary application of rules
  - Responsive regulation can be delegated, cooperative, and inclusive
- Many regulatory methods are as much reactive as adaptive
  - Define the nature and perceptions of the regulatory environment ("constructive")
  - More often advanced by producer interests than consumers or regulators ("best practice")
  - Focused on assurance of cost recovery (from regulators) v. cost management (by utilities)



Symmetry Work 45

Adaptive regulation

- Adaptive regulation is primarily normative (prescriptive)
  - "Good" if consistent with the prevailing paradigm
  - "Bad" if simply reactive, uncritical, or acquiescent
  - Can facilitate the diffusion of both good and not-so-good ideas
  - New methods may come at the expense of traditional methods
  - Largely shaped by politically powerful – producers and special interests over consumers
- Adaptive methods within the paradigm can
  - Recognize evolving values, needs, and goals
  - May be adopted by statute, regulation, rule, or practice
  - Modify traditional regulation or provide alternatives
  - Address problem areas (lag, cost recovery, small systems)
  - Provide flexibility and discretion in the regulatory process
  - Refine incentives for beneficial investment and performance
  - Allow experimentation in ratemaking and rate design
- Adaptive methods should be
  - Understood in terms of tradeoffs
  - Subject to rigorous theoretical and empirical scrutiny

FINANCE, HYDRO, INFRASTRUCTURE

Securing Solid Revenue Streams For Water Utilities Is Crucial For Financial Resilience

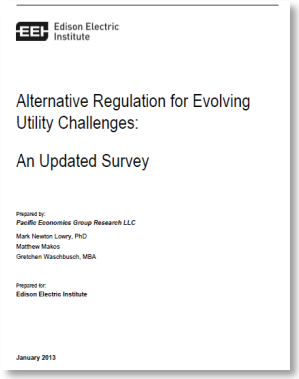
By ANN BUI
on September 10, 2015 at 10:00 AM

Adaptive methods shift risk and call for adjusting returns

- Purchased natural gas adjustments
- Electricity fuel-cost adjustments
- Purchased power adjustments
- Normalization and stabilization
- Single-issue ratemaking
- Interim rates
- Cost deferrals
- Allowance for funds used during construction (AFUDC)
- Construction work in progress (CWIP) in rate base
- Attrition allowances
- Inflation adjustments
- Forward-looking test year
- Operating-cost trackers
- Accelerated depreciation
- Cost-of-service indexing
- Minimum bills
- Demand-repression adjustments
- Lost-revenue adjustments
- Revenue decoupling
- System-improvement surcharges
- Capital-expenditure surcharges
- Securitization of stranded costs
- Project preapproval
- Rate-case time limits
- Self-implementing rates
- Cost-of-capital adjustments
- Earnings adjustments
- Higher fixed charges
- Demand charges
- Customer prepayment
- Multi-year rate plans
- Formula-rate plans

Adaptation can weaken the compact

- *"[We] do stagger through history a like drunk putting one disjointed incremental foot after another" (K. Boulding, 1964)*
- Serial adaptation
  - Reflects "incremental" model policymaking, which tends to lack clear goals and direction
  - Institutional or functional) with numerous isolated and layered mechanisms
  - Includes cost and revenue adjustment mechanisms as well as restructuring
- Asymmetric and excessive adaptation may
  - Nullify long-held core principles and standards
  - Reduce incentives for investment and performance
  - Shift risk from investors to ratepayers
  - Undermine procedural due process
  - Contribute to agency mission creep
  - Weaken regulation as an institution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Alternative Regulation for Evolving Utility Challenges:

An Updated Survey

Prepared by:
Pacific Economics Group Research LLC
Mark Newton Lowry, PhD
Matthew Makos
Gretchen Waschbusch, MBA

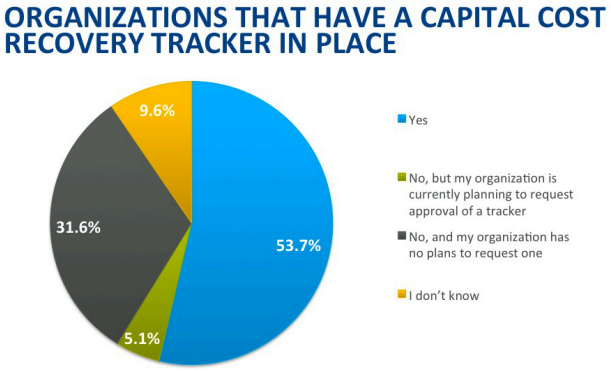
Prepared for:
Edison Electric Institute

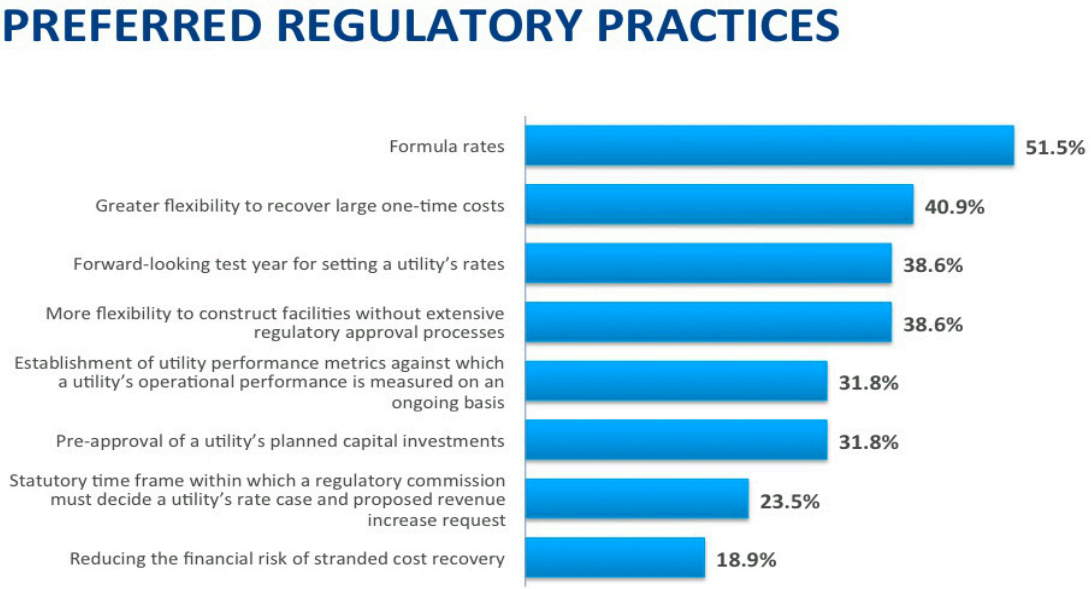
January 2013

- Paradoxically, adaptation may invite results that markets and investors dislike
  - Capriciousness, relativism, discontinuity, instability, and uncertainty

Adaptation can reduce regulatory discretion

- Automatic cost adjustments (trackers)
  - Once used for large, recurring, and volatile operating expenses outside of utility's control have been extended to capital expenditures
  - Numerous reconciliation proceedings can result in higher regulatory expense than full case
- Formula ratemaking further automates regulation
  - Rationalized as a means of avoiding rate-case expense and reducing risk





Regulatory activism also undermines the compact

- Regulation is quasi-legislative, quasi-administrative, and especially quasi-judicial
  - Regulators expert judges but some engage policy activism (legislative role)
  - Sometimes rationalized light of noble causes and the dysfunction of other institutions
- Implications of activism for institutional independence are profound
  - Activism takes non-democratic regulators beyond their institutional remit (see P. Kerin)
  - Bias undermines primary quasi-judicial role and weakens institutional standing
  - Make regulators prone to influence by various special interests who want regulators to be more "constructive," "collaborative," or "proactive"
  - Use of ratemaking for "social engineering" is a departure from economic principles, a form of regressive taxation, and always controversial (e.g., value of service)

		Normative: what should be	
		No	Yes
Positive: what is observed	No	*Regulator is not and should not be proactive*	*Regulator is not but should be proactive*
	Yes	*Regulator is but should not be proactive*	*Regulator is and should be proactive*

Reactive v. proactive regulatory policymaking

Reactive role: judicial	Proactive role: legislative
Principles	Practices
Standards & boundaries	Goals & targets
Authorization	Guarantee
Oversight	Management
Inform policy	Determine policy
Technical neutrality	Technical preferences
Monitor	Compel
Evaluate prudence	Preapprove choices
Review results	Prescribe methods
Structure markets	Design markets
Behavioral incentives	Behavioral control
Corrective	Prescriptive

Relevance of the compact

Challenges to the regulatory compact

- "With the failure in the 1970s of the old "social contract" between utilities and the public, stakeholders are now working toward a new consensus," *(R. Hirsch, 1992)*.
- "Let us bid farewell to the regulatory compact, faithful but fatally flawed servant of the law. A world dedicated to efficient markets, political freedom, and technological innovation has no place for retrospective regulation," *(Jim Chen, 2006)*.
- "The industry is beset by the forces of change… These opportunities will force a retooling of the century-old business model and 'regulatory compact' that supports the current industry," *(P. Fox-Penner, 2010)*.
- "The likelihood of favorable long-term customer defection signals the eventual demise of traditional utility regulatory models," *(RMI, 2015)*.

In defense of the regulatory compact

- The regulatory paradigm applies as long as requisite conditions apply
  - A living regulatory compact can accommodate growing and changing infrastructure needs
  - Utilities can and should pursue new business models and regulators should evaluate them relative to market failure, network integrity, and the public interest
- Historically and today, the regulatory compact
  - Recognizes the essential nature of utility services and benefits of networks
  - Provides for capital-intensive investment, scale economies, service extension
  - Provides powerful performance incentives through both risks and rewards
  - Ensures attention to achieving social goals efficiently and equitably
  - Conditions the terms of service for the enfranchised monopoly (including social goals)
- Today's "new" context
  - Sustainability will replace the growth paradigm for utilities - which can be defined as operating within economic, ecological, and equity tolerances
  - The mix of regulated and competitive options will change
  - Roles and methods can be adaptive and still consistent with the compact
  - New forms of market failure and power may call for reinforcing the compact

If not the compact, then what?

- Public policy and regulation must still do what markets cannot and will not do
  - Deregulation will leave a vacuum of authority to address persistent market failures
  - Regulation is a largely reactive institution – where form follows function (structure)
- Regulators should not choose new business models for utilities or shield them from risk
  - Investment will flow to new business models – regulated or unregulated
  - Monopolies should continue to be regulated and compensated – regardless of scale
  - Competitive services should not be "monopolized" without clear justification
- Other policy institutions and instruments are needed if economic regulation by independent agencies ceases
  - Public or cooperative ownership (direct provision)
  - Licensure, certification, and registration
  - Consumer protection
  - Social services (household assistance)
  - Tax policies (including credits)
  - Strategic and targeted subsidies
  - Competitive franchises
  - Access and exit rules
  - Antitrust enforcement
  - Contract law
  - Technical standards
  - Self-regulation