
If Electricity Liberalization is Working?
Then why do so many people hate it?

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UC Davis

Outline

- The political economy of liberalization
- Industry background
 - Some economists jargon
- Forces behind liberalization in the US
- Digression: what happened in California
- Judging the results in the U.S.
 - Why its tricky to do so.

The Electricity Industry:

- Generation
 - Production of electric energy
- Transmission
 - High voltage transportation of energy
- Distribution
 - Low-voltage, local “delivery” of energy
- Retailing
 - Buying from generators - selling to end-users
- Historically fully integrated (1 company) and either state-owned or regulated under *cost-of-service* principles

Some Economics Jargon (its good for you)

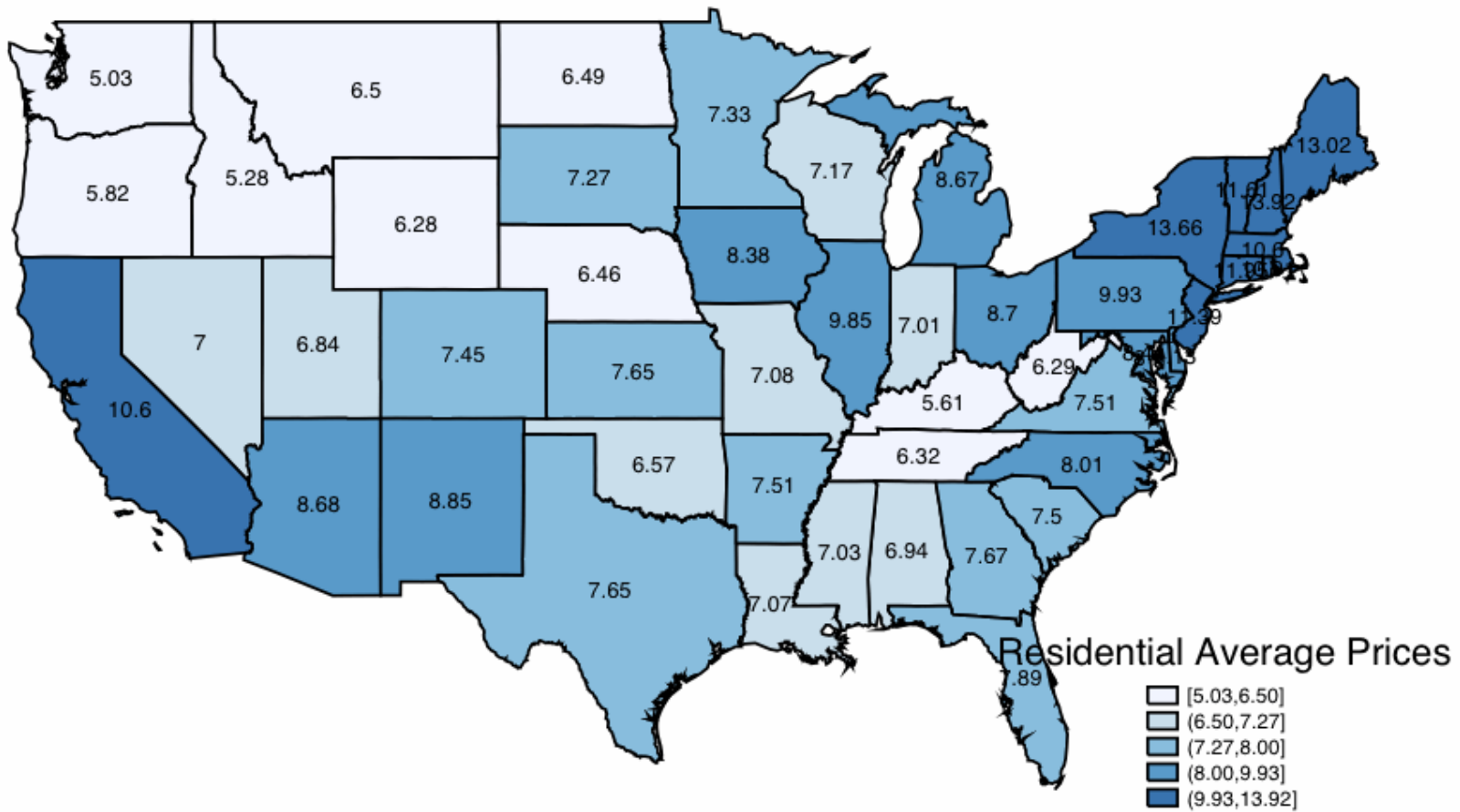
- *Total costs*
 - All-in costs of providing a good or service
 - Regulated firms guaranteed to recover all their (“reasonable” costs)
- *Average costs*
 - total cost per unit
 - The regulated price (total costs/quantity) (theoretically)
- *Marginal costs*
 - Cost of producing *1 more* unit (e.g. kwh)
 - *Does not* include fixed costs
 - *Can get really big if capacity is constrained*
 - The *competitive* market price (*theoretically*)

Two Perspectives on Costs and Prices

- Accountant's (regulatory) perspective
 - Firm's need to recover all their costs
 - Prices set at average costs
 - Means customer incentives are off
 - Firm's have weak (no?) incentive to control costs
- Economist's (markets) perspective
 - Firm's should earn what a product is "worth"
 - Customer value helps determine prices
 - What the "market will bear"
 - Total costs are irrelevant
 - If market is competitive prices will be driven to marginal costs
- Industry organizational decision
 - Do benefits of market incentives outweigh risks of poor competition?

Regulation Produced Widely Varying Results

The Average Residential Retail Price of Electricity was 8.26 cents per Kilowatt hour in 1998



Utility Liberalization: what is it?

- Production sector not a natural monopoly
- Consumers separated from producers by natural monopoly transmission and distribution
- Restructuring goal: provide competition for supply
 - ‘Unbundle’ transport from other functions
 - Provide transport ‘access’ to producers at the unbundled rate
 - Deregulate production pricing

Electricity Liberalization is often associated with cuddly animals



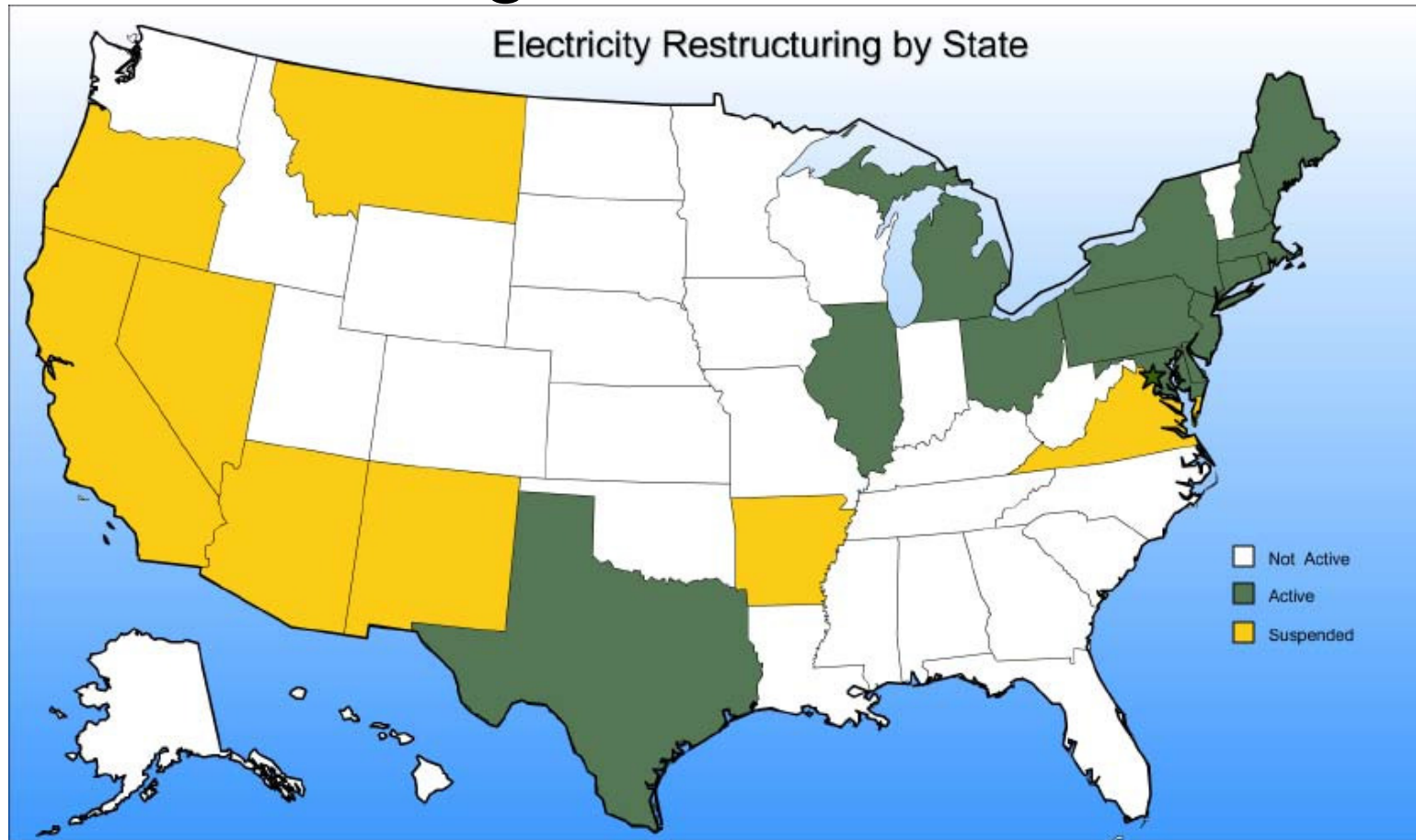
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The Electricity Industry: Focus of Deregulation

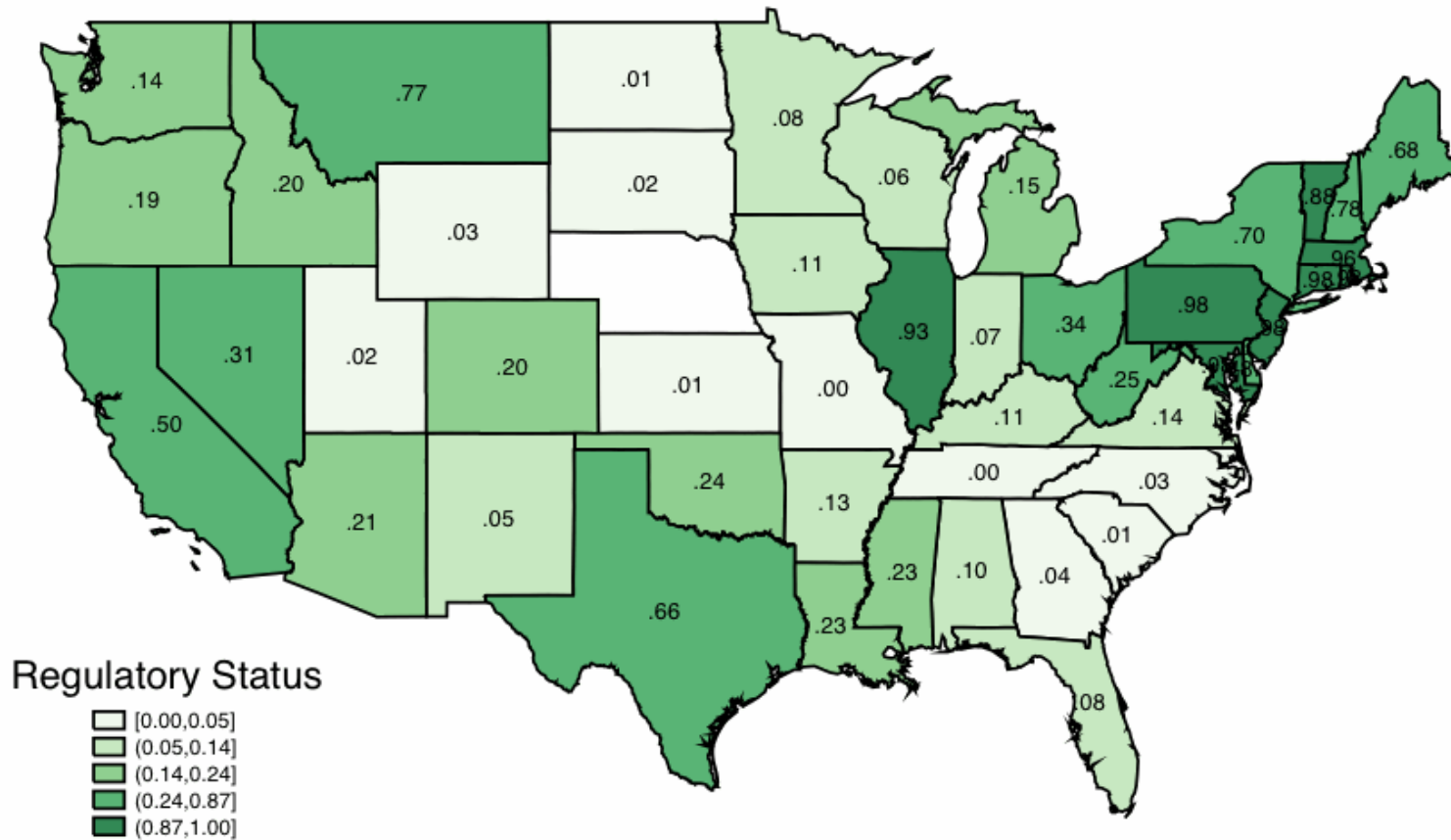
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Defining Restructuring (1): Deregulation of Retail



Defining Restructuring (2): Deregulation of Generation

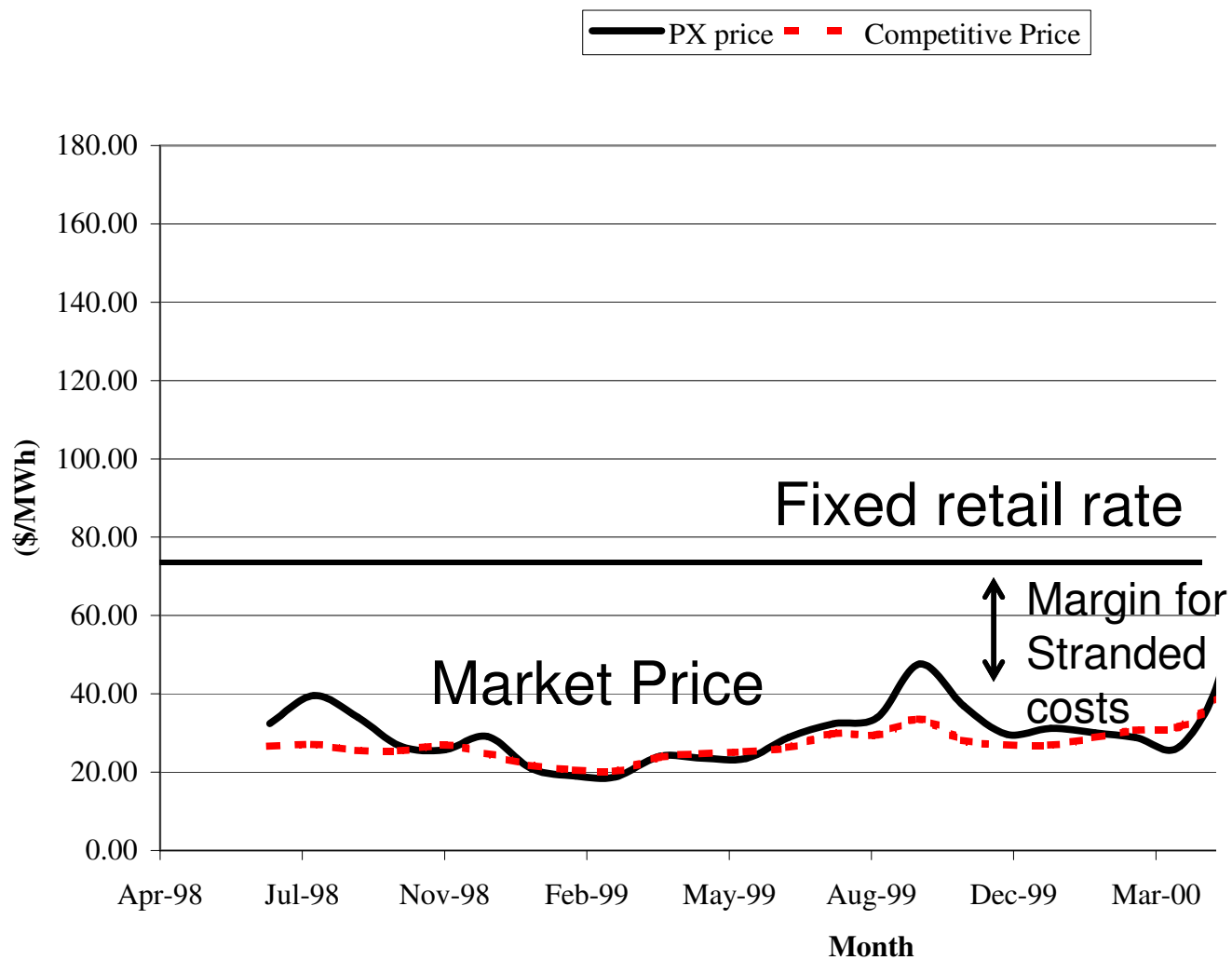
Pct. of Gen. from IPP



Electricity: Why Restructure?

- Cement Manufacturers: to get those low rates like Oregon has
- Why rates were high in California in 1996
 - investment decisions and sunk costs
 - these costs don't go away with restructuring
 - operations were reasonable efficient
- How might we save money from restructuring?
 - make better investment decisions
 - rate-payers not on the hook for bad decisions
 - more efficient consumption - real-time pricing?
- Irony: Sunk costs often drive restructuring, yet restructuring does nothing to reduce sunk costs
- Sunk costs would become 'stranded'

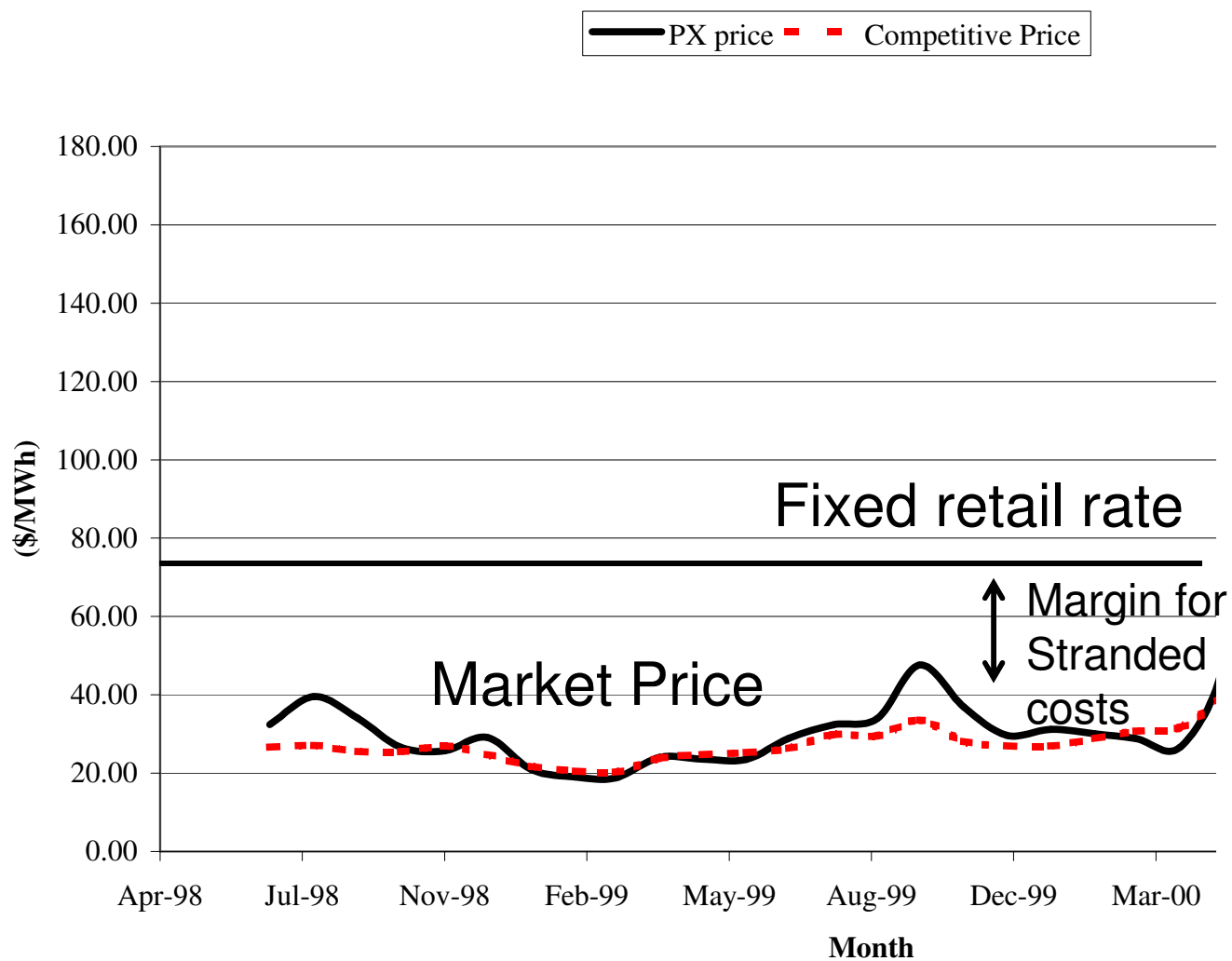
Average California PX price and MC



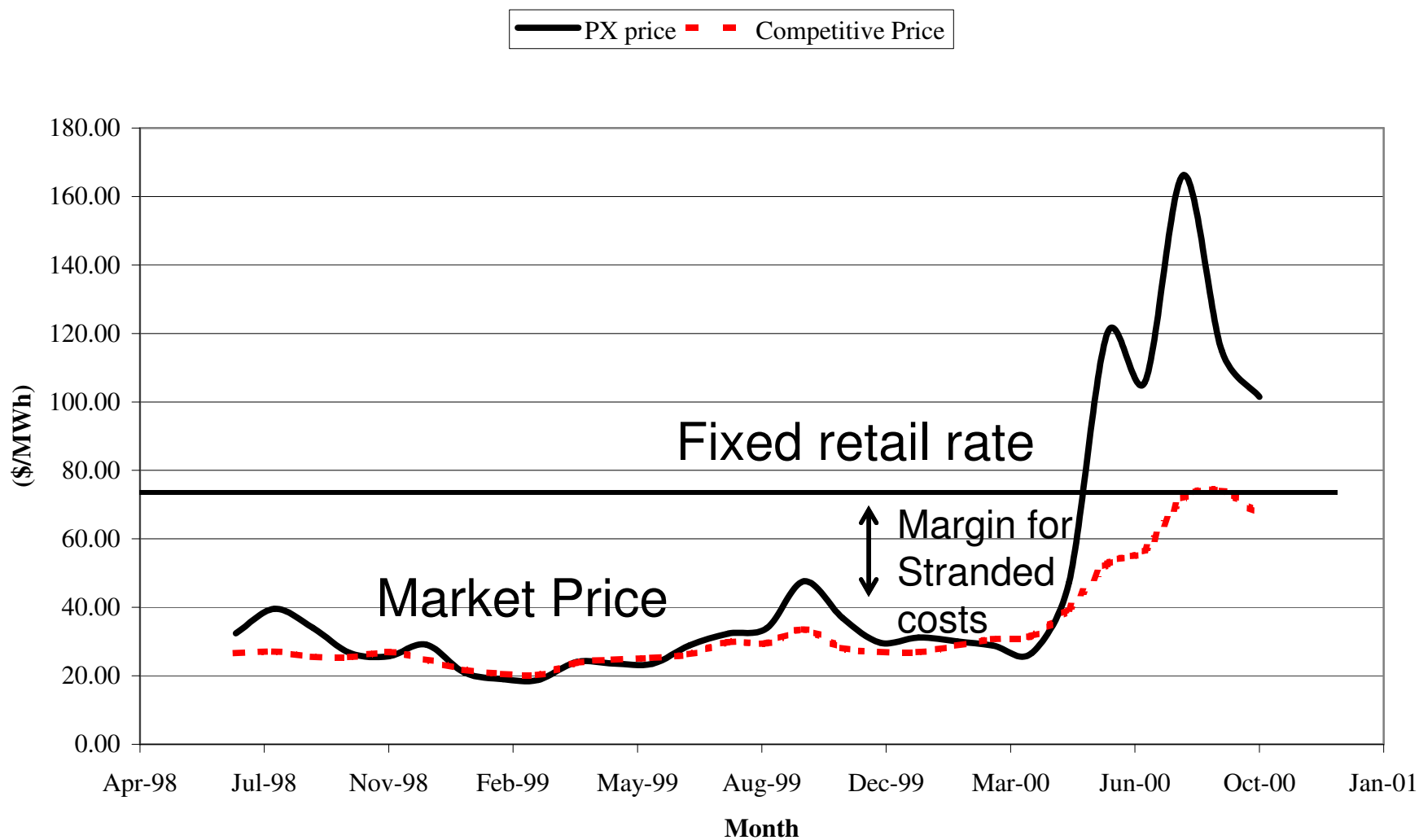
Market Power in Electricity Markets

- Market power is ability to raise prices above marginal cost of production
- Is particularly a problem in markets with
 - Low demand elasticity
 - Costly storage & fluctuating demand
 - Binding supply constraints (inelastic supply)
 - Binding transportation constraints (inelastic supply)
- Electricity markets have all these problems
 - Can be particularly vulnerable to market power
 - Hedging is critically important (but another talk..)

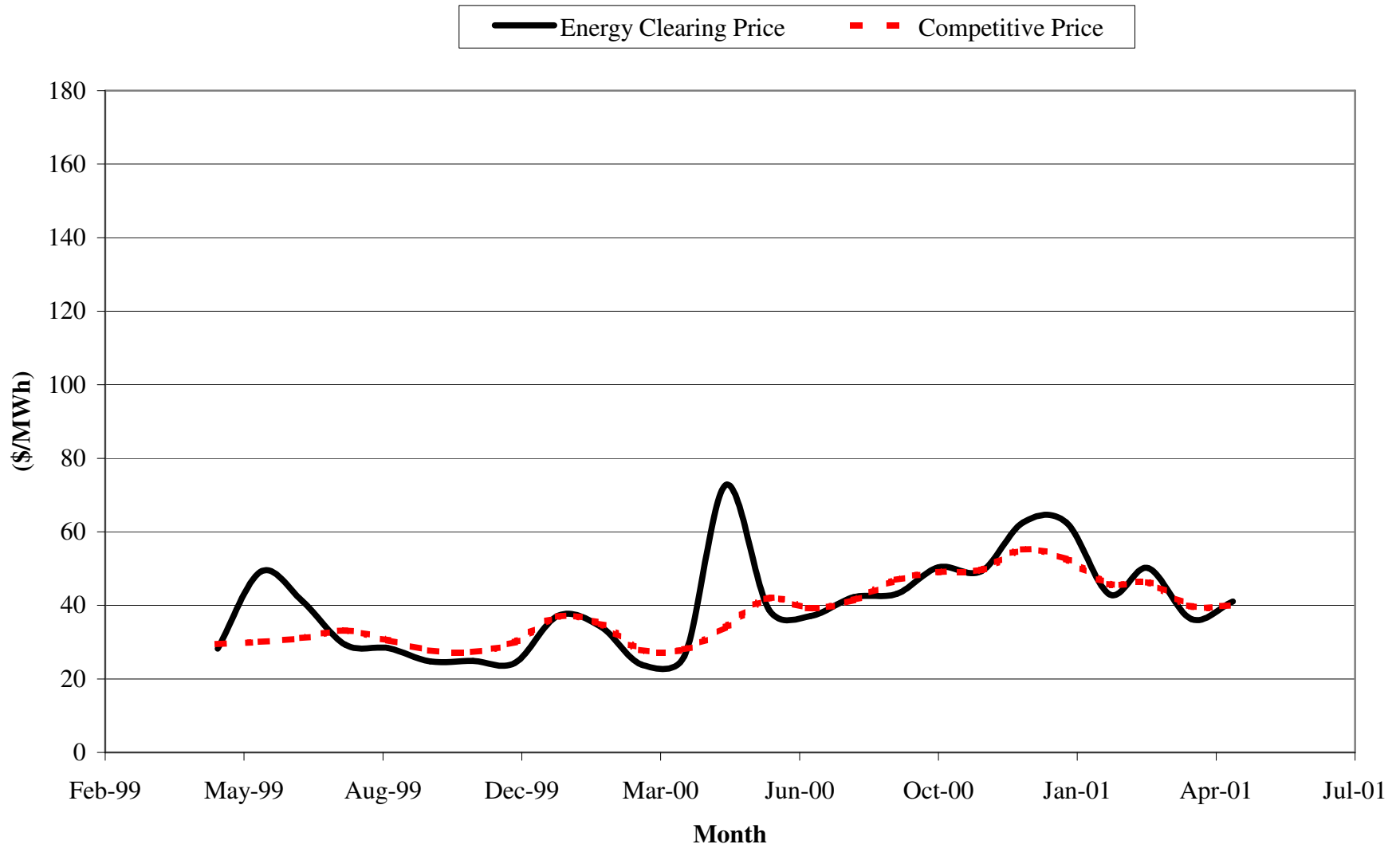
Average California PX price and MC



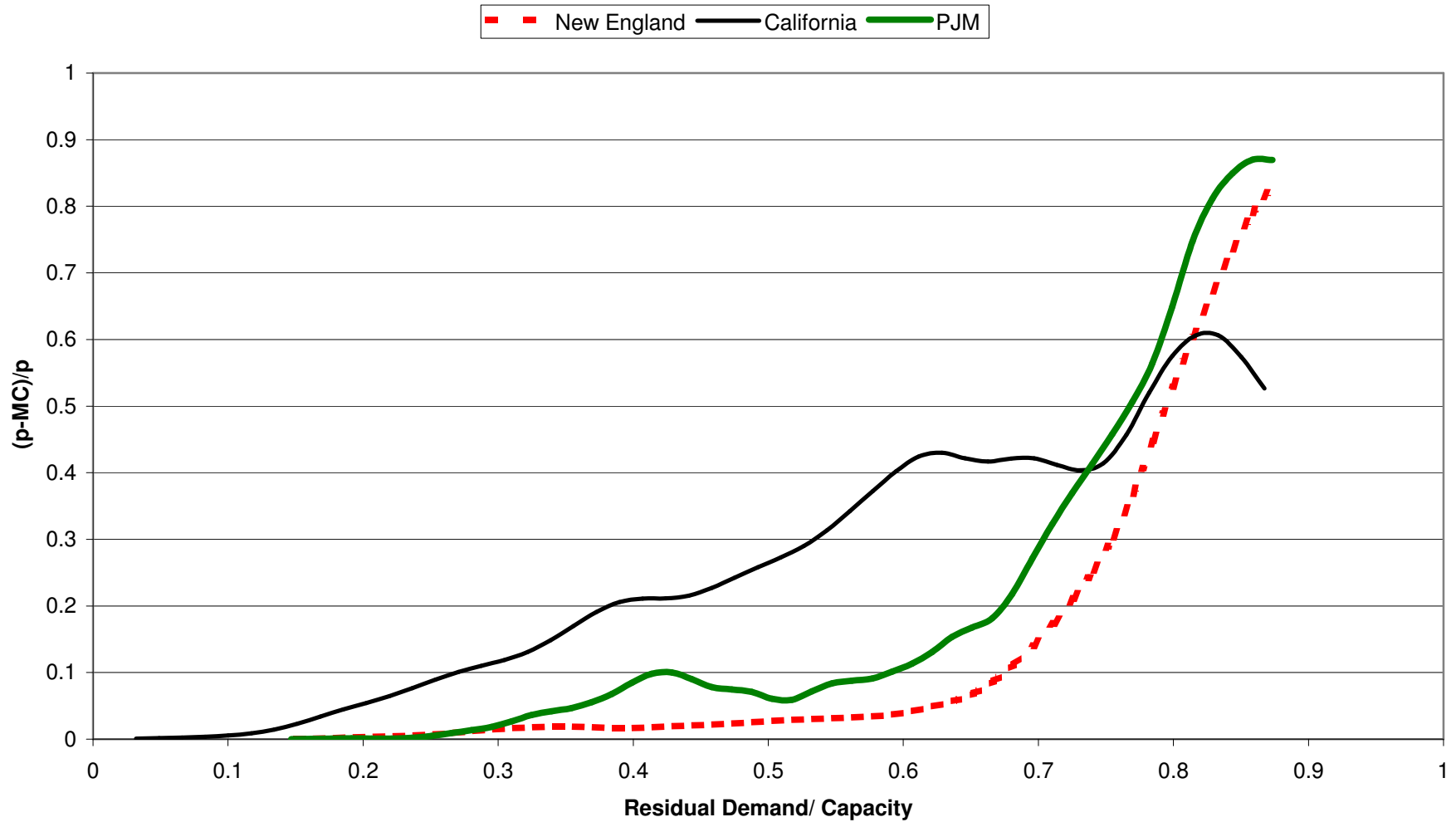
Average California PX price and MC



New England Energy Clearing Price and MC



Kernel Regressions of Lerner Index vs. Capacity Ratio (May - December 1999)





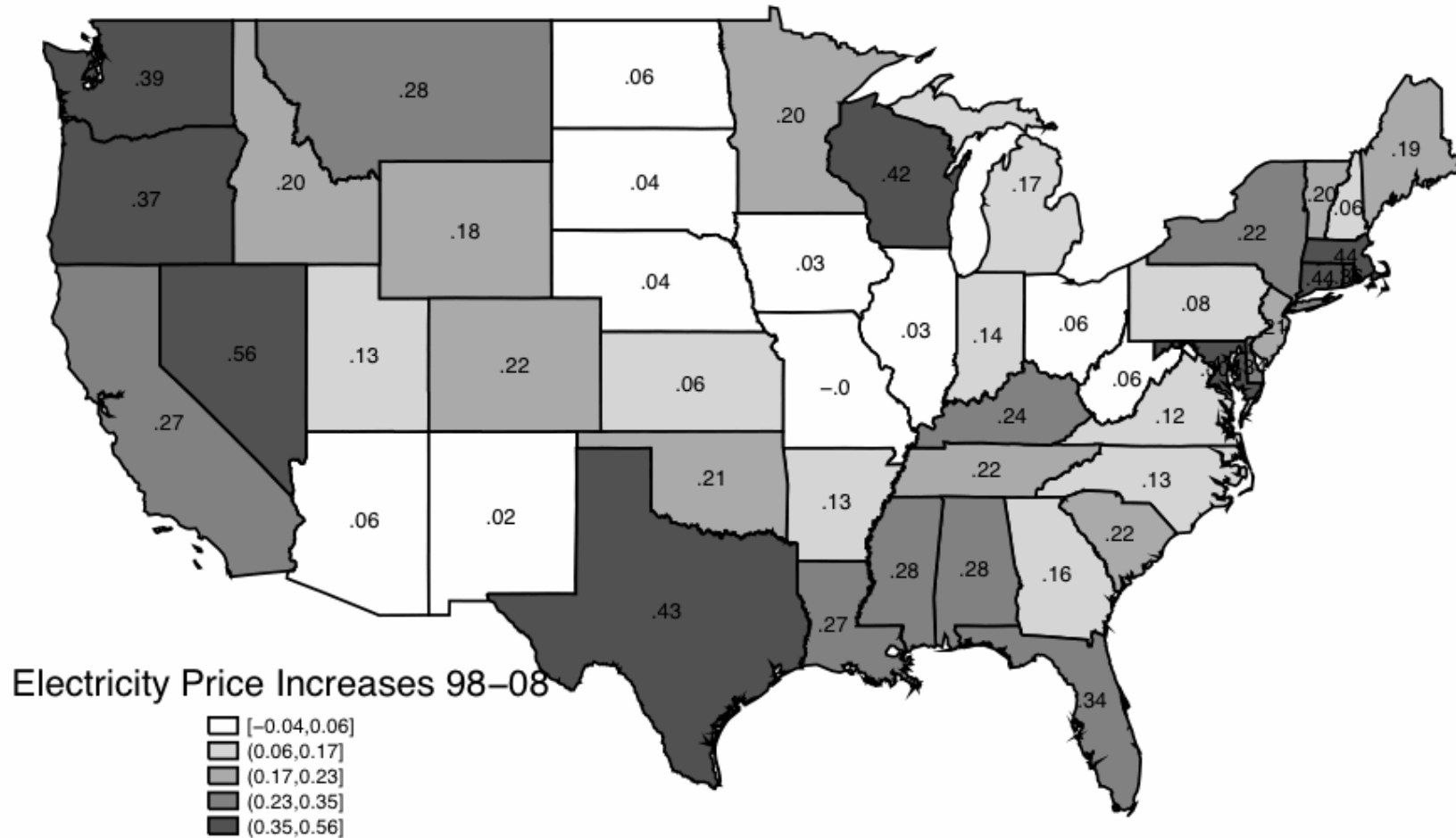
The New York Times
nytimes.com

October 15, 2006

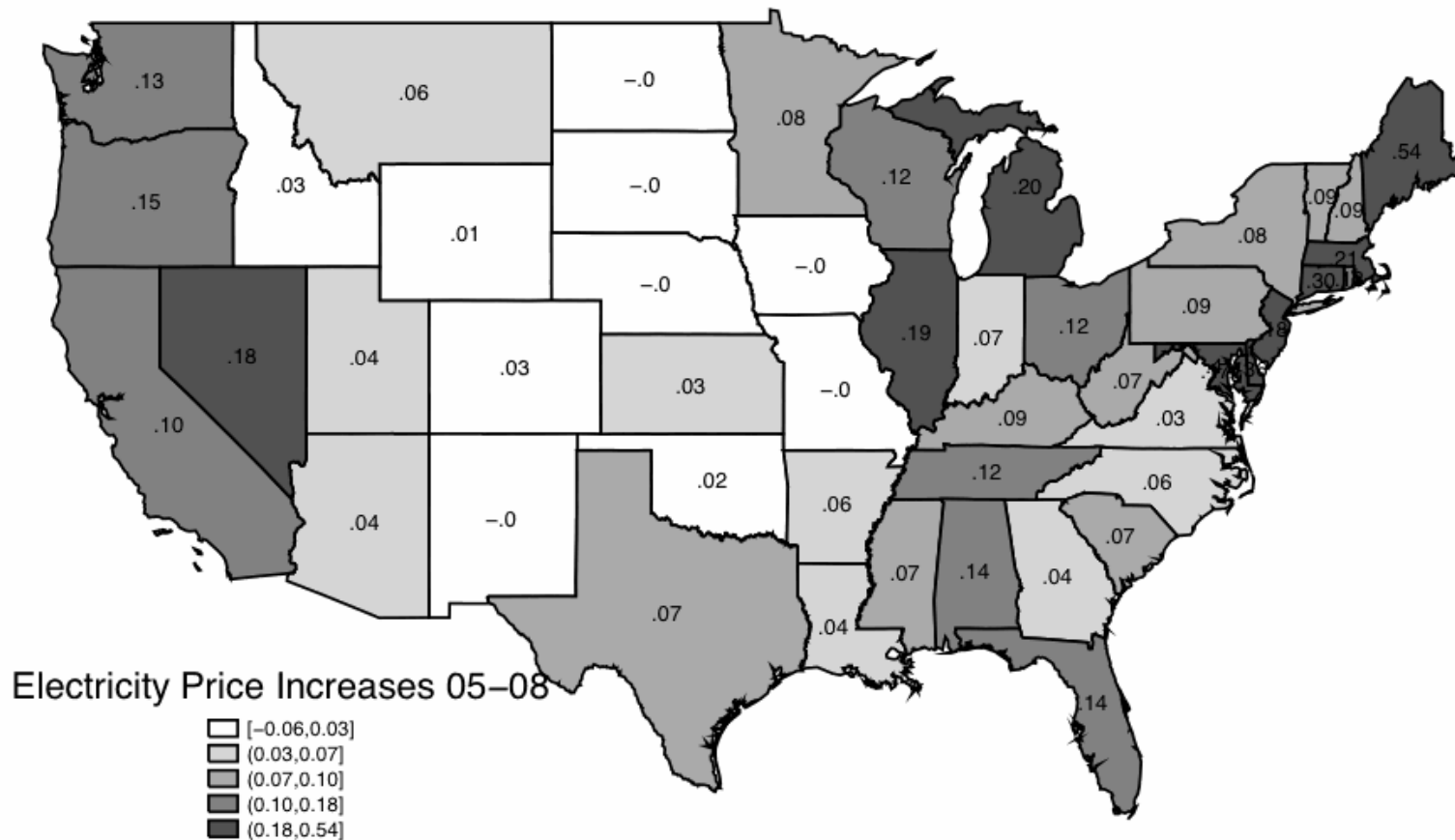
Competitive Era Fails to Shrink Electric Bills

By DAVID CAY JOHNSTON

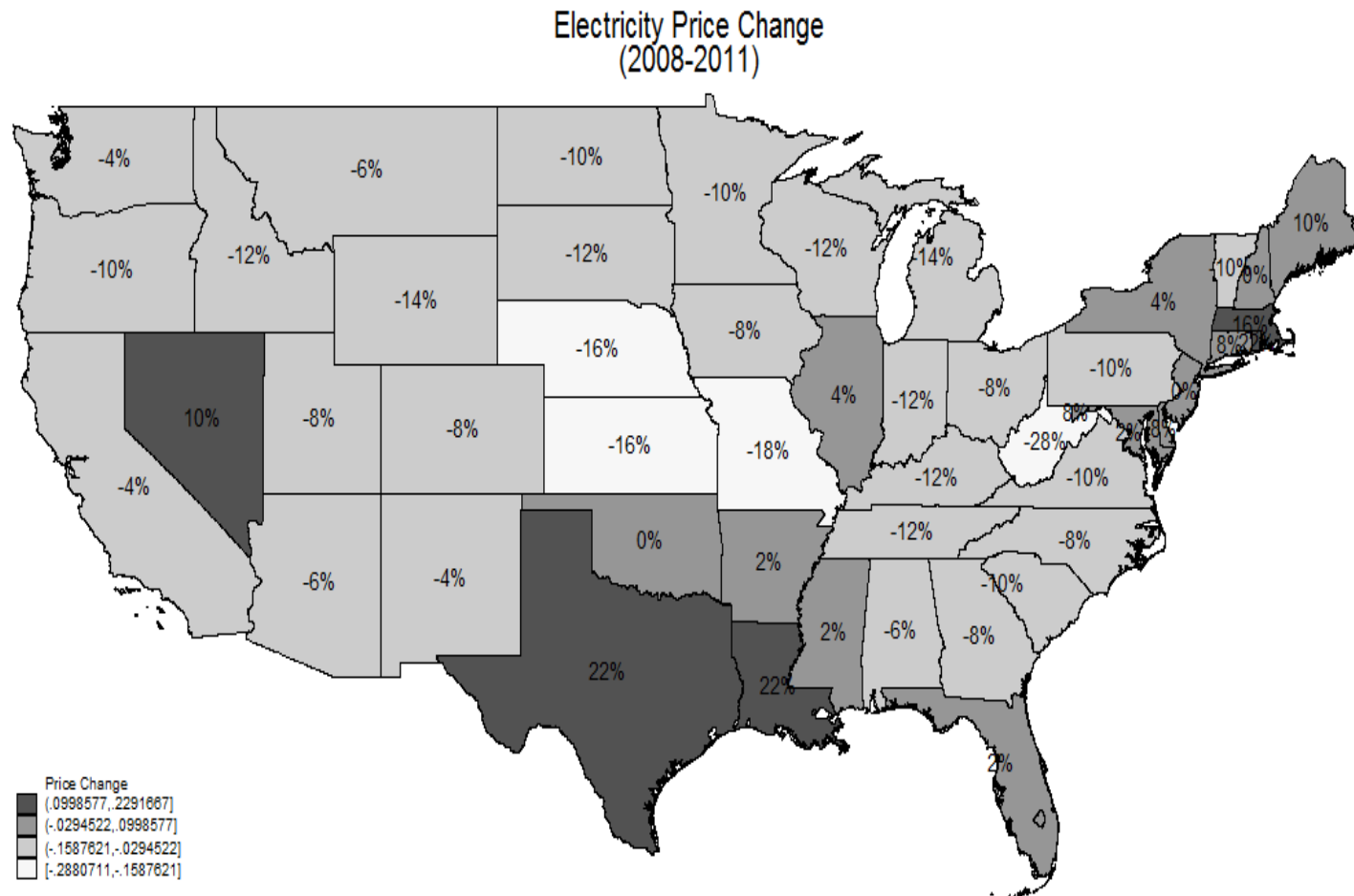
Price Increases 1998-2008



Price Increases 2005-2008



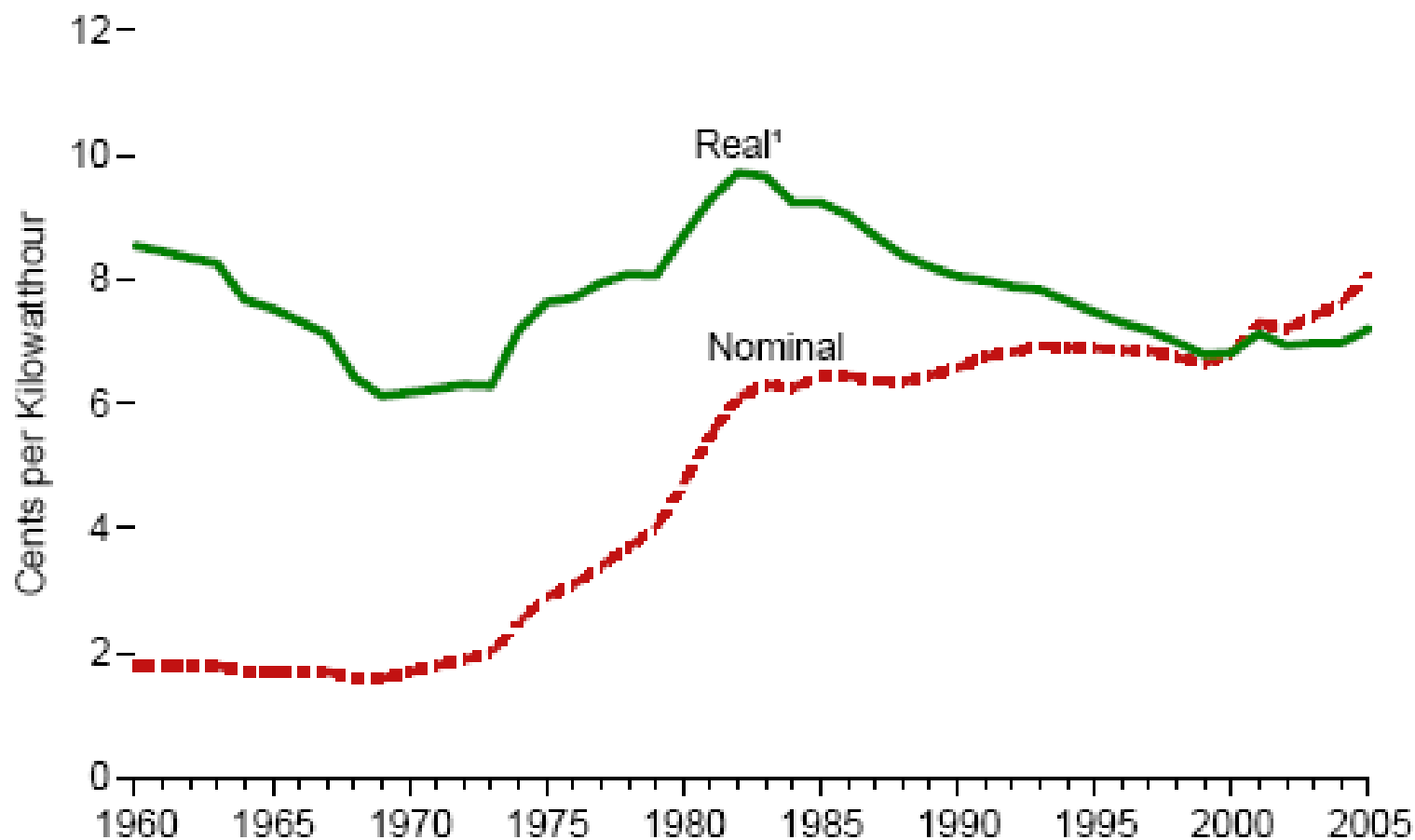
Price Increases 2008-2011



The difficulty in judging the impacts of restructuring

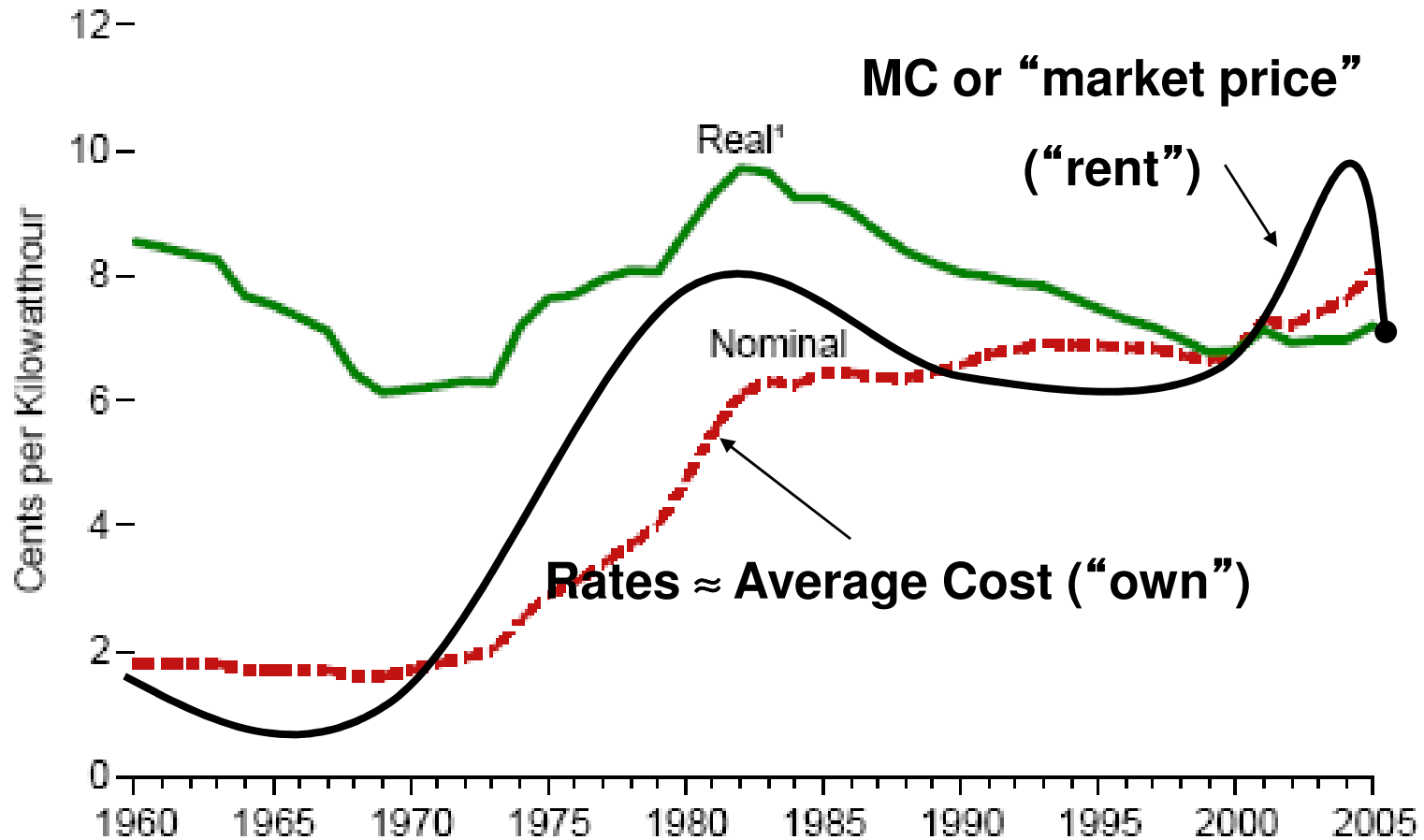
- The challenges with a focus on retail rates
 - Tremendous time lags between wholesale and retail outcomes in many regions
 - Controlling for diversity in starting conditions
 - Isolating impacts of restructuring from other changes
- Marginal Cost (deregulation) will at times be above and at times below Average Cost (regulation)
 - Which looks better depends upon when you look

Average Retail Price of Electricity, 1960-2005

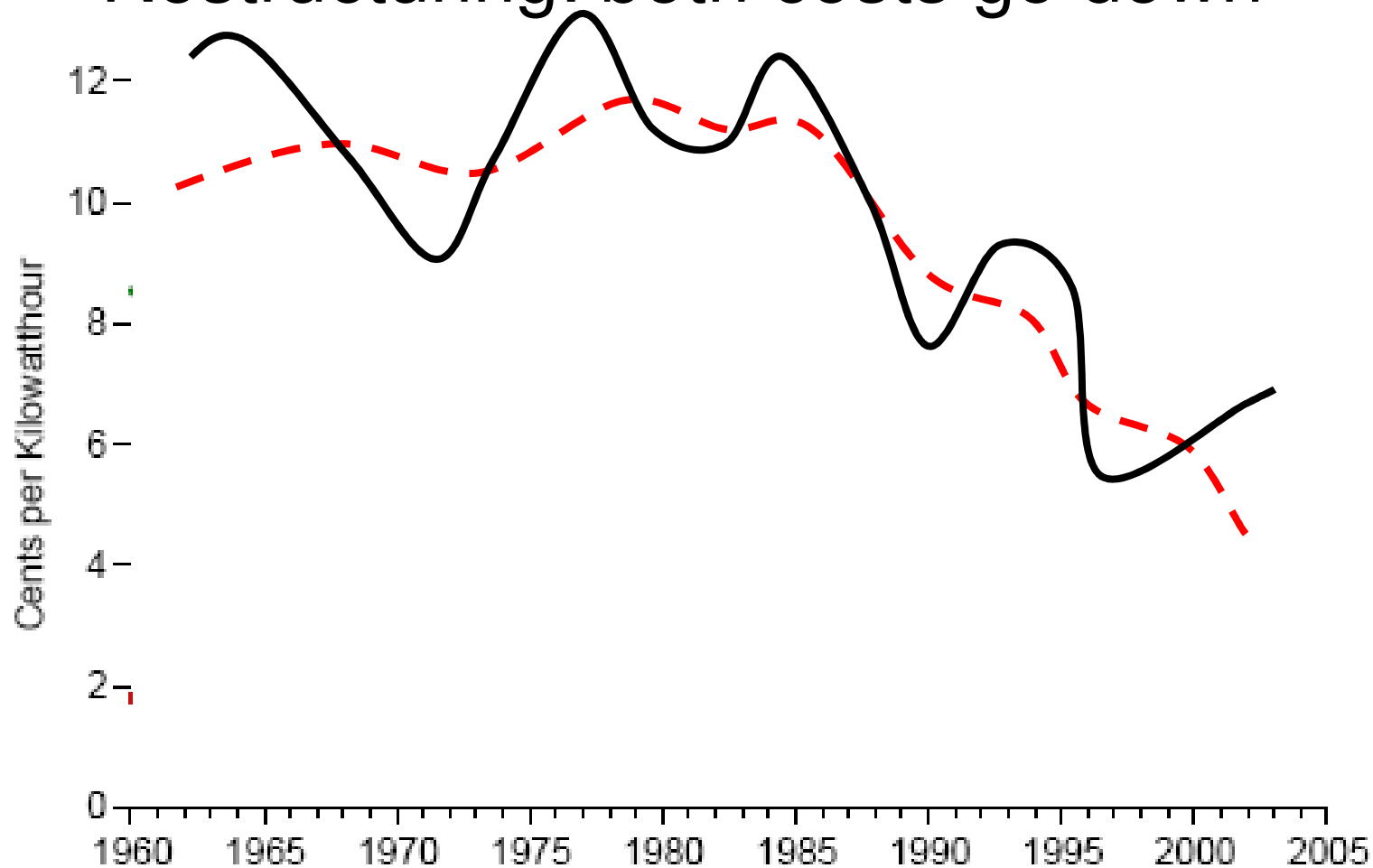


Source: EIA, http://www.eia.doe.gov/emeu/aer/pdf/pages/sec8_38.pdf.

Average Retail Price of Electricity, 1960-2005



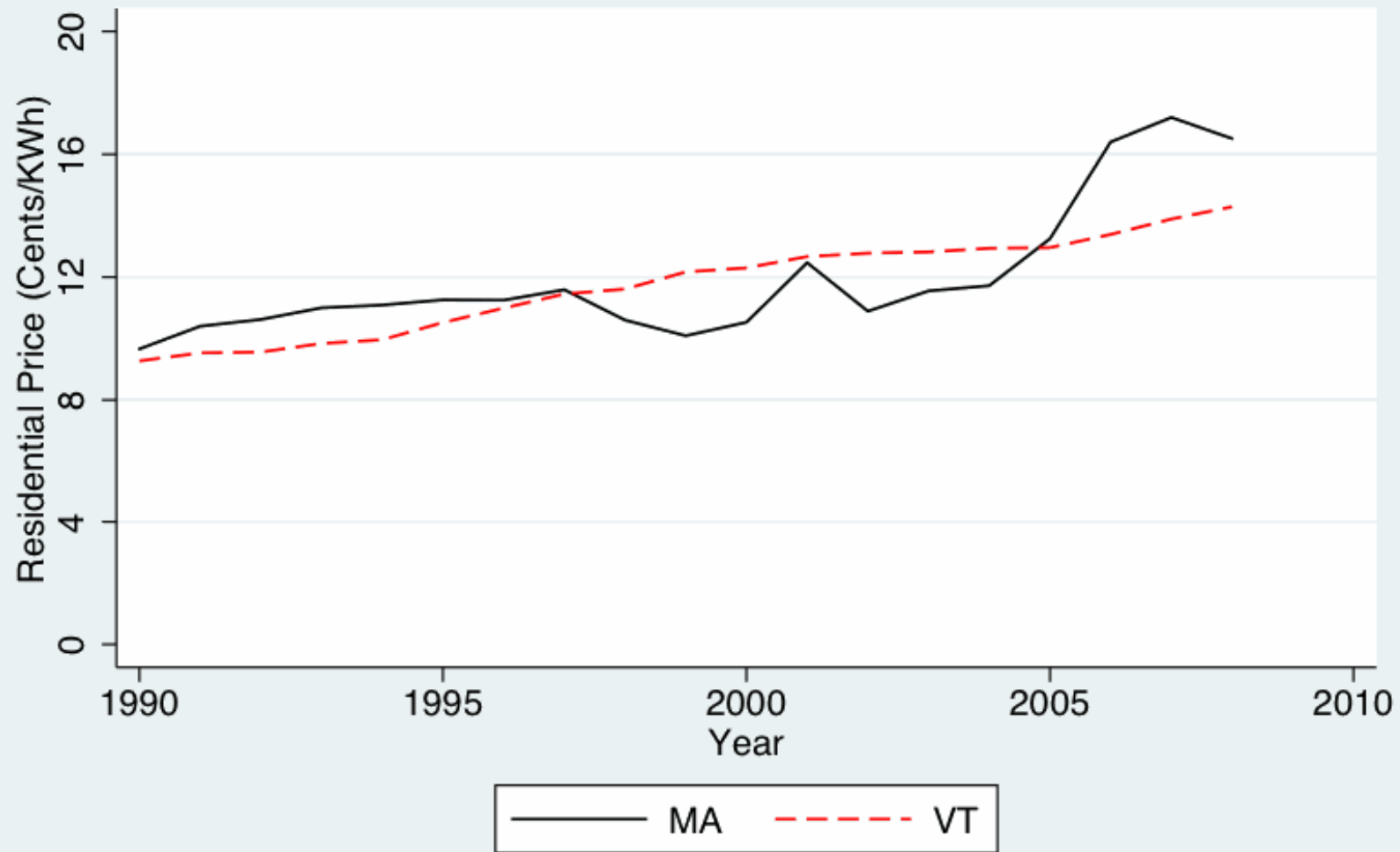
Theoretical (hoped for) Impact of Restructuring: both costs go down



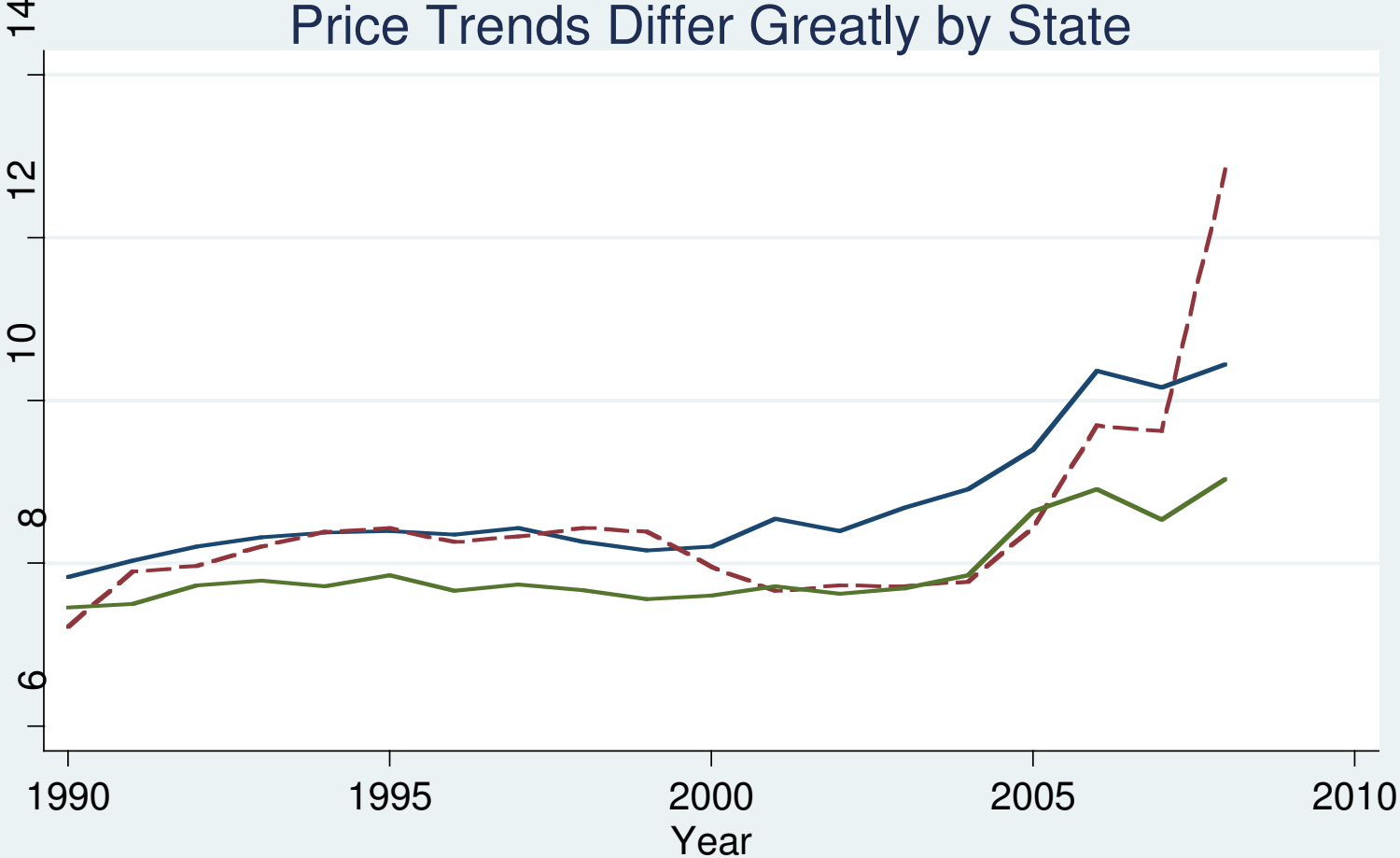
Source: Completely fictional data made up by me.

Reality: Both types of costs have gone up

Mostly due to fuel prices

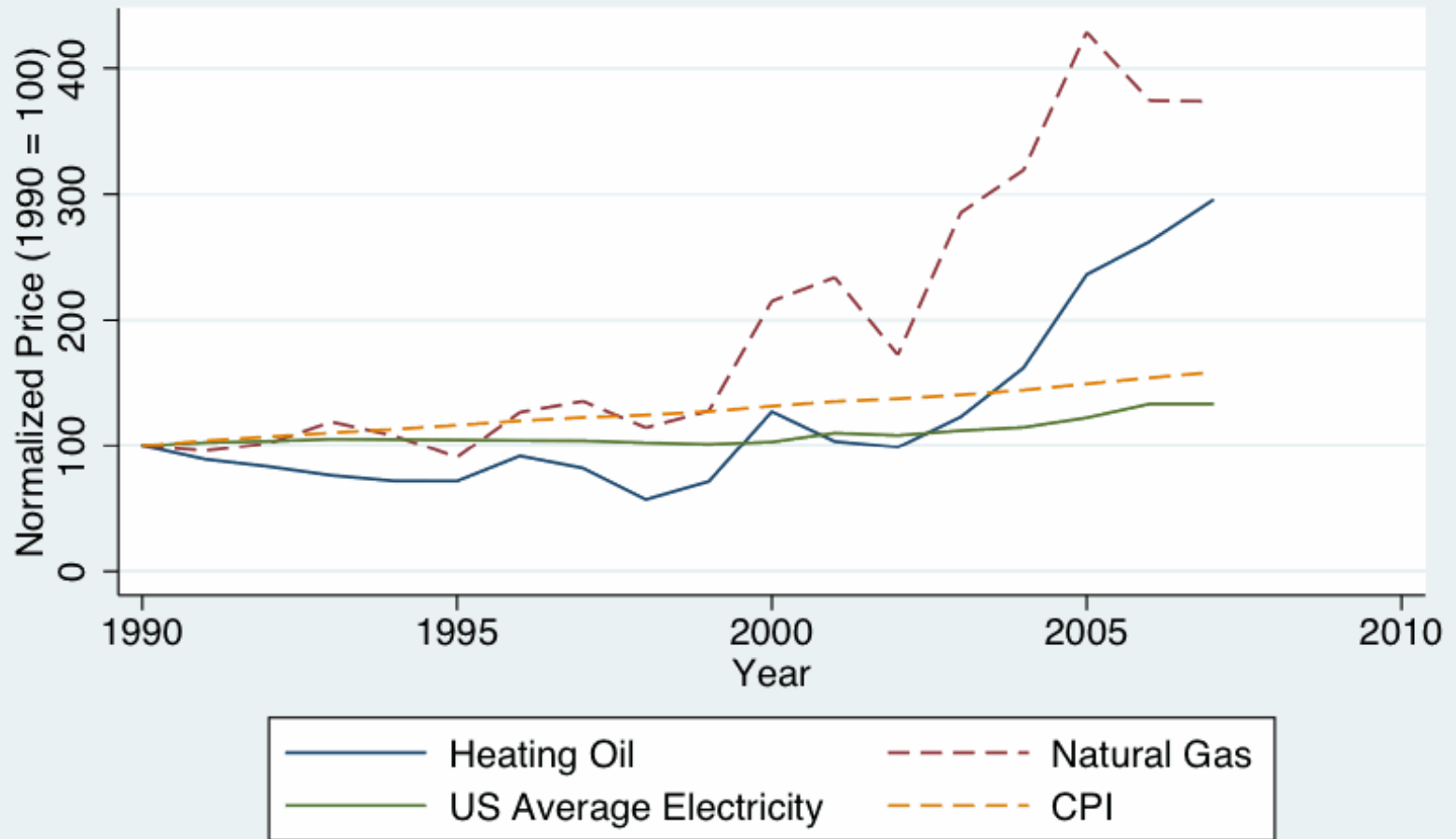


Price Trends Differ Greatly by State



— US Residential Average - - - MD
— GA

Rates of Price Increases of Energy Commodities Changes since 1990



All prices are normalized so that 1990 price = 100.

Studying the component parts

(A bottom-up approach)

- Productive Efficiency
 - Operating costs (heat rates, employment, etc.)
 - Dispatch efficiency
 - Investment choices and costs
- Market Efficiency
 - Do prices approach short-run MC plus scarcity *when there is scarcity?*
- Competitiveness
 - Do prices reflect long-run marginal costs on average?
 - Are prices close to short-run MC plus scarcity

Pricing: Summary

- Restructuring is like “selling” the plants and “renting” their output
- Appeal of that strategy depends upon market timing
 - Timing of most US states has been lousy in this regard
 - Coal & Nuke plants looked bad in 1998, look really good now
- This doesn’t mean restructuring couldn’t lower average prices over time
- This depends upon whether benefits of “market” incentives outweigh the costs of setting up these markets
 - Evidence on that is mixed
- Signs of another reversal (in the US) of the “rent vs. own” relationship
 - Carbon regulation of coal plants, gas “fracking” lowering natural gas prices, renewable energy driving prices down

Thank You!