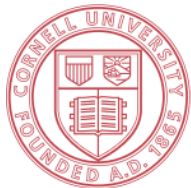




How Small is Too Small? Scale Economies in Water Utilities

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Cornell University



New York State
Water Resources Institute



Water Infrastructure

- States and municipalities face pressures
 - Aging and inadequate infrastructure
 - Declining federal and state support
 - Ratepayer burden



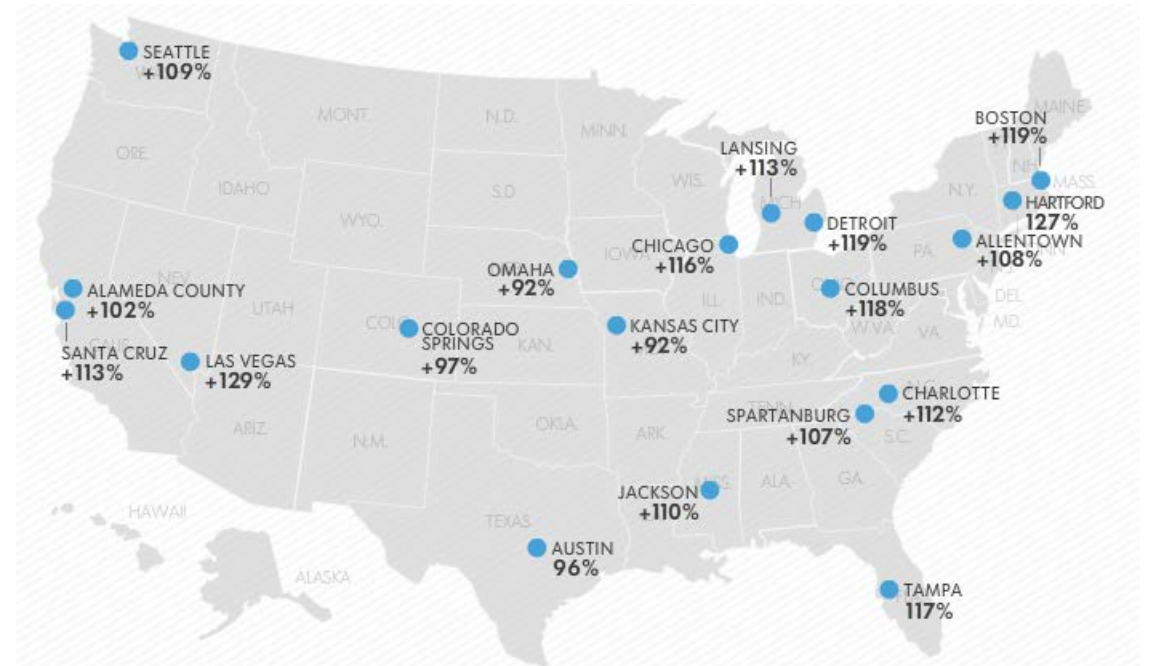
Water main break in Cayuga St, Ithaca (2013)



Rate increases



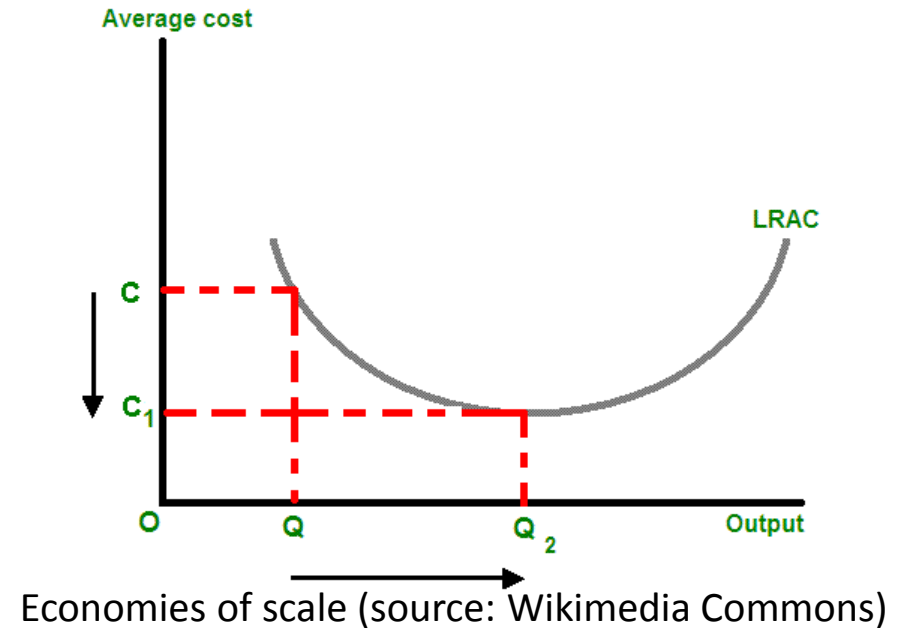
130-233% increase (2000-2012)



90-129% increase (2000-2012)

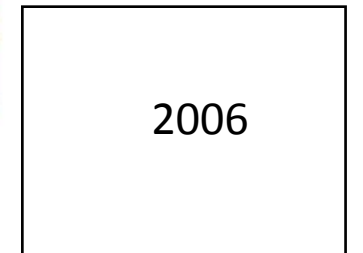
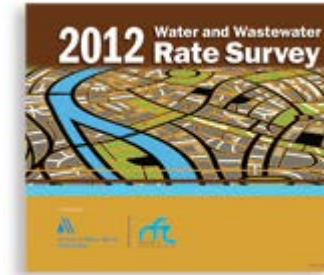
Economies of Scale

- Is bigger better?
 - Are smaller municipalities less efficient?
 - Would merger and consolidation help?
- Unit production cost varies with firm size
- High fixed cost, low variable cost
- Minimum efficient scale
- Goal: maximize social returns for public investment
- Applies to both production & distribution

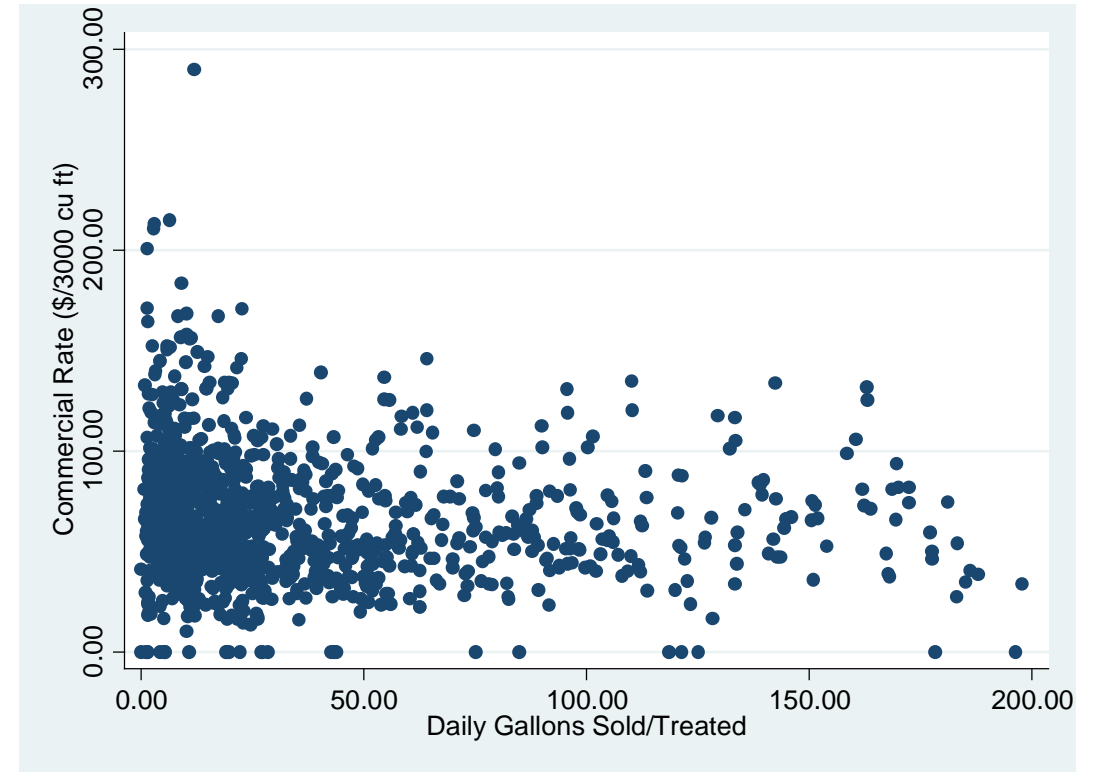
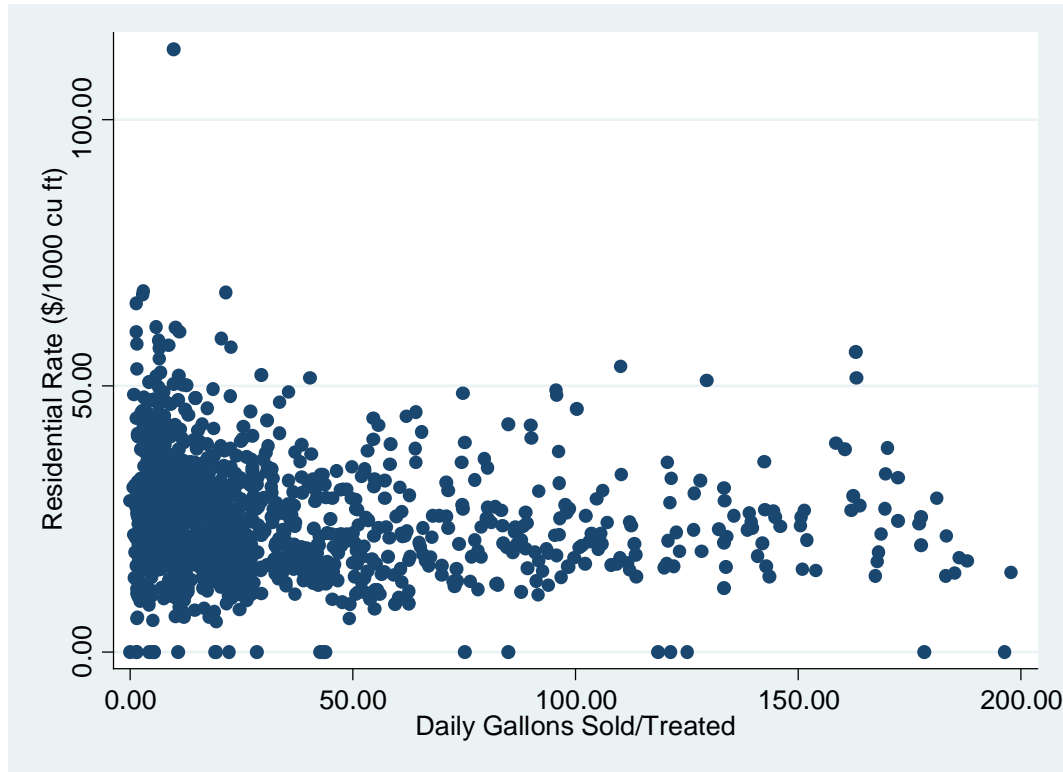


Data

- AWWA rate surveys for water and wastewater
 - Proxy for cost of production & distribution
- 290 water utilities in 44 states + DC (2012)
- 2004-2012 yielding 1,371 observations
- Larger dataset than previous studies
- Rates
 - Average residential (1000 cu ft)
 - Non-manuf./commercial (3000 cu ft)
- Volume (MGD), debt ratio, staff productivity, source



Results



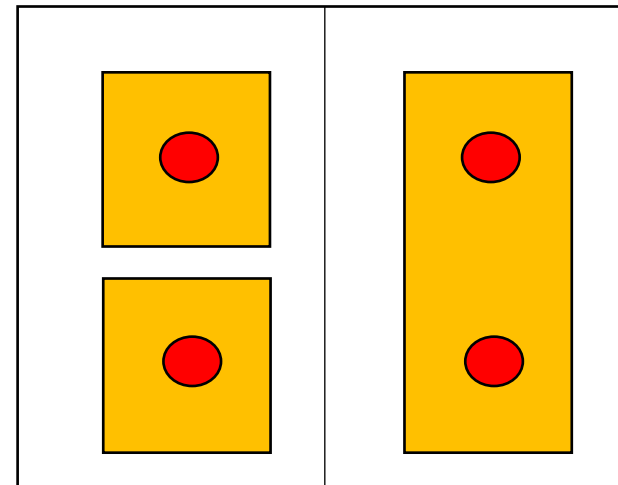
Residential (L) and commercial (R) water rates as a function of system size (measured in MGD)

Results

- Semi-log OLS regression (pooled and fixed effects)
- Economies of scale evident
- Higher rates are associated with
 - Smaller systems
 - Higher debt ratio
 - Low staff productivity (possible interaction with RtW states?)*
 - Privately-owned (IOU)
 - County or Authority
 - Surface water; purchased
 - Northeast
- Results hold for Mid-Atlantic region as well

Discussion

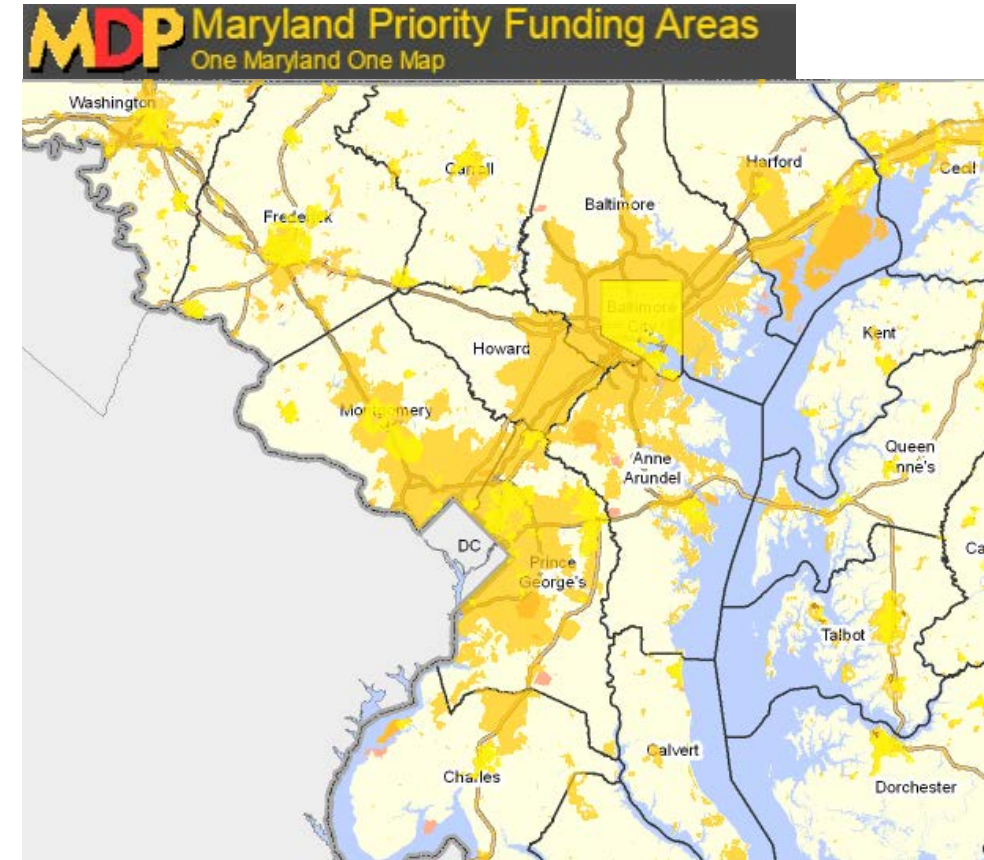
- Long-run costs are lower for larger utilities
 - Technology
 - Customers
 - Financial market
 - Shock insulation
- Let's talk consolidation
 - The idea of merging small utilities
 - Physical or administrative
 - Density could play a key role



Consolidation at work

Discussion

- Smart Growth and Priority Focus Areas
- Incorporate city-specific characteristics
 - Density
 - Median income
 - Temp and precip
 - Bond ratings
- Governance/jurisdiction issues are tough
- Decentralization aided by federal grants
 - Will it now be reversed?



Final Thoughts

- Infrastructure needs and outlays are enormous
 - Creative ways needed to bridge the gap
- Optimizing public investment is a priority
- Water utilities display economies of scale
 - Consolidation could be an option
 - Inter-municipal cooperation
 - Infill growth could yield real savings
- Dedicated rainy-day funds
- Public inclusiveness



Thanks

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