How Small is Too Small?
Scale Economies in Water Utilities

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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)

Vedachalam et al., 2014, *Public Works Mgmt & Policy*
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-runs 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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