



# Measuring Disparities in Non-School Costs and Revenue Capacity among Massachusetts Cities and Towns

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# Motivation

- Reports in 2005 by Municipal Finance Task Force and Northeastern University / MMA documented local government difficulties:
  - Shortfalls in local revenue
    - Recent cuts in aid
    - Longer-term structural difficulties
  - Inadequate municipal service provision – costly to Commonwealth.
- Recommended access to more local revenue – local option taxes and local aid.



# Local Aid

- Why aid?
  - Only state government can collect funds statewide
  - and distribute them among cities and towns to address unequal *ability* to provide local services.
- Why a new aid formula?
  - No existing formula is “right” for distributing new aid dollars aimed at general municipal (non-school) services:
    - Additional Assistance formula
    - Lottery aid formula
  - Unlikely that any new municipal aid dollars will be legislated until there is a new formula.



# Objectives of a New Formula

- Supports **municipal** services.
- Distributes aid to equalize ability of cities and towns to provide a standard quality and quantity of non-school services
  - more aid to municipalities with higher unavoidable costs
  - more aid to municipalities with lower ability to raise local revenue – “local revenue capacity”



# Roadmap

- Measure non-school unavoidable costs.
- Measure non-school local revenue capacity.
- Calculate the “gap” between a community’s non-school costs and revenue capacity.
- Mention issues on aid formula design.



# Costs

- Cities and towns spend different amounts per capita to provide local services because of
  - choices about *quality* of services
  - *efficiency* of service provision
  - *unavoidable costs* to provide a standard bundle of services
- Unavoidable costs – example

A community with more jobs per capita needs to spend more on services for commuters, such as traffic lights, plowing, road maintenance, and police and fire protection.



# Identify Cost Factors

- Using statistical techniques other researchers have used (linear regression)
- Investigate local social and economic characteristics that are outside local control and that determine the harshness of the environment for producing local services.
- Most important unavoidable cost factors:
  - population density
  - population size
  - poverty percent
  - unemployment rate
  - jobs per capita

## Estimated Coefficients in the Cost Regressions

|  | Adjusted non-school spending (total) | Public safety | Adjusted public works | General government, health, welfare, culture, & recreation | Debt service, fixed cost, and other |
|--|--------------------------------------|---------------|-----------------------|--|-------------------------------------|
| <i>Cost Factors:</i>   |                                      |               |                       |  |                                     |
| Population density   | 13.9 ***                             | 6.00 ***      | 1.05                  | 2.35 *   | 4.47                                |
| Log population   | 34.8 ***                             | 43.3 ***      | -28.9 ***             | -1.6   | 22.0 **                             |
| Percent of population in poverty   | 14.1 ***                             | 0.81          | 1.63 *                | 1.65 **  | 10.05 ***                           |
| Unemployment rate  | 39.4 **                              | 23.8 ***      | 4.7                   | 14.6 ***   | -3.7                                |
| Private jobs by place of work per resident   | 220 ***                              | 68.0 ***      | 53.8 **               | 38.6 ***   | 59.8 *                              |
| <i>Also include measures of resources, preferences, and institutional factors?</i> | Yes                                  | Yes           | Yes                   | Yes  | Yes                                 |
| R-squared  | 0.760                                | 0.697         | 0.220                 | 0.790  | 0.647                               |

Based on 320 cities and towns

Asterisks indicate confidence with which estimated coefficient is significantly different from zero:

\*\*\*99% or greater; \*\*95% to 99%; \*90% to 95%.

# Cost Measure for Prototype Municipalities

|                                    | Average<br>Community | Community<br>A<br>(Large<br>City) | Community<br>B<br>(Urban<br>Suburb) | Community<br>C<br>(Rich<br>Suburb) | Community<br>D<br>(Resort<br>Town) |
|------------------------------------|----------------------|-----------------------------------|-------------------------------------|------------------------------------|------------------------------------|
| <b><i>Cost Factors:</i></b>        |                      |                                   |                                     |                                    |                                    |
| Population density                 | 1.26                 | 6.00                              | 4.00                                | 0.50                               | 0.17                               |
| Log population                     | 9.00                 | 11.40                             | 10.50                               | 9.00                               | 8.30                               |
| Percent of population in poverty   | 6.00                 | 18.00                             | 7.00                                | 3.30                               | 4.50                               |
| Unemployment rate                  | 2.61                 | 5.00                              | 2.00                                | 1.10                               | 2.40                               |
| Jobs by place of work per resident | 0.37                 | 0.40                              | 0.30                                | 0.30                               | 0.56                               |
| <b>Cost</b>                        | 869                  | 1,289                             | 934                                 | 745                                | 842                                |



# Local Revenue Capacity

- Local revenue capacity is defined as *ability* of local governments to raise revenue from local sources (not actual revenue raised).
- Therefore, revenue capacity should reflect:
  - Resources city or town government can tap
  - Constraints on tapping resources, such as tax limitations
  - Not local government choices or behavior.



# Local Revenue Capacity

- Existing local aid formulas measure revenue capacity from the property tax as a constant proportion of property values (e.g., lottery aid formula).
- This assumes that all cities and towns can tap into their property tax base to the *same degree*.
- But under Prop 2½, cities and towns are able to tap into property tax base to *varying degrees*.



## Constraints of Prop 2½

- Prop 2½ caps property tax rate (“levy ceiling”) and limits annual revenue growth (“levy limits”).
- The effect of Prop 2½ constraints was estimated by looking at the relationships between residential property tax levies, residential property tax bases, and residents’ incomes.
  - found the ability to tap into residential property tax base under Prop 2½ increases with income.

## Estimated Coefficients in the Residential Capacity Regressions

Dependent Variable: Log Per Capita Residential Levy

|                       | Baseline  | Robustness Checks |           |           |           |           |
|-----------------------|-----------|-------------------|-----------|-----------|-----------|-----------|
|                       | (1)       | (2)               | (3)       | (4)       | (5)       | (6)       |
|                       |           |                   |           |           | (HH)      |           |
| Log residential value | 0.664 *** | 0.616 ***         | 0.635 *** | 0.720 *** | 0.674 *** | 0.723 *** |
| Log income            | 0.333 *** | 0.307 ***         | 0.323 *** | 0.290 *** | 0.386 *** | 0.255 *** |
| Preference and taste  | No        | Yes               | Yes       | No        | No        | No        |
| Cost factors          | No        | No                | Yes       | No        | No        | No        |
| Log CIP value         | No        | No                | No        | Yes       | No        | No        |
| R-squared             | 0.858     | 0.876             | 0.882     | 0.883     | 0.872     | 0.839     |
| Observations          | 321       | 321               | 320       | 321       | 321       | 310       |

Asterisks indicate confidence with which estimated coefficient is significantly different from zero:

\*\*\*99% or greater; \*\*95% to 99%; \*90% to 95%.



# CIP Tax Capacity

- Tax capacity of commercial, industrial and personal (CIP) property is measured separately from tax capacity of residential and open space property.
- CIP capacity is measured as proportional to CIP value.
  - Income does not seem to be a factor.

Property tax capacity =  
Residential capacity + CIP capacity



## Other Local Revenue Capacity

- Ability to raise revenue from other local sources (e.g., motor vehicle excise)
- Subtract the capacity that is “used up” for purposes other than general municipal services.
  - Examples: required local funds for public schools, MBTA, and other state assessments.

Non-school local revenue capacity =  
Property tax capacity + Other local  
revenue capacity – Required local funds

# Capacity Measure for Prototype Municipalities

|  | Average<br>Community | Community<br>A<br>(Large<br>City) | Community<br>B<br>(Urban<br>Suburb) | Community<br>C<br>(Rich<br>Suburb) | Community<br>D<br>(Resort<br>Town) |
|--|----------------------|-----------------------------------|-------------------------------------|------------------------------------|------------------------------------|
| <b><i>Property Tax Capacity Factors:</i></b>           |                      |                                   |                                     |                                    |                                    |
| Per capita residential property value                  | 78,786               | 24,500                            | 100,000                             | 175,000                            | 460,000                            |
| Per capita income                                      | 27,233               | 16,500                            | 42,000                              | 58,000                             | 28,000                             |
| Per capita CIP property value                          | 17,211               | 6,000                             | 16,000                              | 7,000                              | 43,000                             |
| <b>Property Tax Capacity</b>                           | 1,212                | 461                               | 1,538                               | 2,219                              | 3,777                              |
| <b>Other Local Revenue Capacity</b>                    | 115                  | 50                                | 135                                 | 160                                | 325                                |
| <b>Statutorily Required Reductions<br/>in Capacity</b> | 650                  | 250                               | 950                                 | 1,250                              | 1,040                              |
| <b>Capacity</b>  | 677                  | 261                               | 723                                 | 1,129                              | 3,062                              |

# Gap = Costs - Capacity

|                                     | Average<br>Community | Community<br>A<br>(Large<br>City) | Community<br>B<br>(Urban<br>Suburb) | Community<br>C<br>(Rich<br>Suburb) | Community<br>D<br>(Resort<br>Town) |
|-------------------------------------|----------------------|-----------------------------------|-------------------------------------|------------------------------------|------------------------------------|
| <b>Cost</b>                         | 869                  | 1,289                             | 934                                 | 745                                | 842                                |
| <b>Capacity</b>                     | 677                  | 261                               | 723                                 | 1,129                              | 3,062                              |
| <b>Non-School Cost-Capacity Gap</b> | 192                  | 1,028                             | 211                                 | -383                               | -2,220                             |



# Aid Distribution

- New aid would be equalizing:
  - allocate new aid in proportion to gap, providing more funds for places with higher unavoidable costs and/or lower local revenue capacity.
- Issues on formula design:
  - “Baseline” gap
  - Non-zero aid floor
  - Treatment of existing aid
  - “Hold harmless”
  - Statewide total new aid dollars