11.433J / 15.021J Real Estate Economics
Fall 2008

# Week 7: Local Governments, Property Taxes and Real Estate

- How services, taxes and revenue sources vary by government in the U.S.
- How services, taxes and revenue sources vary by town within MSA.
- Property taxes and Property values.
- Town Fiscal Incentives
- Town stratification by income.

# Federal and State governments transfer money, Local government provide direct services. Other countries?

**Government Expenditures,* 1990-1991**

| *Expenditure* | *Federal* | | *State* | | *Local* | | *All Governments* | |
|---|---|---|---|---|---|---|---|---|
| | *Direct* | *Transfer*** | *Direct* | *Transfer* | *Direct* | *Transfer* | *Expenditure**** | *Transfer* |
| Defense and international relations | 366,112 | — | — | — | — | — | 366,112 | — |
| Health, welfare, and social insurance § | 523,071 | 101,472 | 207,986 | 32,781 | 94,301 | 3,111 | 825,358 | 137,364 |
| Education | 20,192 | 24,537 | 80,468 | 116,180 | 228,834 | 429 | 329,494 | 141,146 |
| Infrastructure and natural resources §§ | 54,801 | 18,382 | 52,808 | 11,985 | 51,107 | 779 | 158,716 | 31,146 |
| Law enforcement and fire protection §§§ | 8,111 | 736 | 22,592 | 2,154 | 51,332 | 103 | 82,035 | 2,993 |
| Sewage, solid waste management, and utilities | 0 | 0 | 8,050 | 761 | 99,802 | 96 | 107,852 | 857 |
| Other * | 347,077 | 15,018 | 70,391 | 22,679 | 92,133 | 883 | 509,601 | 38,580 |
| Total | 1,319,364 | 160,145 | 442,295 | 186,540 | 617,509 | 5,401 | 2,379,168 | 352,086 |

•Millions of 1991 dollars

*(adapted from DiPasquale and Wheaton, 1996)*

•** Transfer columns represent intergovernmental transfers to all other levels of government. Total expenditure per category for each level of government is the sum of Direct and Transfer columns

*** Excludes duplicative intergovernmental transactions.

§ Includes social services and income maintenance, insurance trust expenditure, housing, and community development

§ § Includes natural resources, parks, and recreation, highways, air transportation/airports, and other transportation

§ § § Includes police protection, fire protection, and correction

* Includes other general expenditures such as space research and technology, postal service, and libraries; government administration; and interest on debts.*

# Why don't local governments have income/sales taxes, and why don't federal and state governments use property taxes?

**Government Receipts,* 1990-1991**

| Revenue Source | Federal | State | Local | All Governments |
|---|---|---|---|---|
| Personal income and wages** | 856,170 | 201,031 | 26,229 | 1,083,430 |
| Corporate income | 98,086 | 20,357 | 1,886 | 120,329 |
| Excise*** | 58,495 | 160,009 | 86,229 | 304,803 |
| Property | 0 | 6,228 | 161,772 | 168,000 |
| Fees § | 167,123 | 97,627 | 125,126 | 389,876 |
| Other taxes | 17,574 | 31,163 | 9,039 | 57,776 |
| Receipts from intergovernmental transactions | 3,234 | 143,534 | 201,833 | 348,601 |
| Total revenue | 1,200,682 | 659,949 | 612,184 | 2,124,214 |
| Employment (thousands) | 3,091 | 4,115 | 10,076 | 17,281 |

*adapted from DiPasquale and Wheaton (1996)*

* In millions of 1991 dollars.

** Includes individual income, and insurance trust revenue

*** Includes sales, gross receipts and customs, and utility and liquor store revenue

§ Includes charges and miscellaneous general revenue.

§ § Civilian. Includes employees outside the United States.

§ § § Excludes receipts from intergovernmental transactions.

Central cities spend almost as much as wealthier suburbs. How? State equalization grants, and the pattern of location of commercial property.

*(adapted from Dipasquale and Wheaton, 1996)*

## Selected Profiles of Massachusetts Cities, 1990

| Item | Boston | Burlington | Concord | Needham | Quincy |
|---|---|---|---|---|---|
| 1989 Median HH income | 30,757 | 58,975 | 73,695 | 63,618 | 37,795 |
| Households | 250,683 | 8,054 | 4,764 | 10,405 | 37,732 |
| Population | 574,283 | 23,302 | 17,076 | 27,557 | 84,985 |
| Unemployment rate | 5.50% | 5.00% | 2.70% | 3.20% | 5.80% |
| *Expenditures* | | | | | |
| Education/pupil | 6,679 | 5,501 | 7,179 | 6,053 | 5,836 |
| Education/HH | 1,438 | 2,340 | 3,156 | 1,876 | 992 |
| General government/HH | 280 | 244 | 339 | 214 | 136 |
| Police and fire/HH | 836 | 773 | 641 | 544 | 590 |
| Other public safety/HH | 224 | 36 | 41 | 62 | 39 |
| Public works/HH | 284 | 577 | 300 | 416 | 313 |
| Health and welfare/HH | 704 | 76 | 64 | 56 | 19 |
| Culture and recreation/HH | 138 | 165 | 234 | 101 | 67 |
| Debt service/HH | 328 | 233 | 256 | 370 | 205 |
| Other expenditures/HH | 955 | 816 | 553 | 855 | 902 |
| Total expenditures | 5,184 | 5,260 | 5,584 | 4,495 | 3,263 |
| *Revenues* | | | | | |
| State aid/HH | 1,846 | 707 | 554 | 360 | 942 |
| Local receipts/HH | 1,425 | 993 | 434 | 954 | 461 |
| Total property tax levy/HH | 2,071 | 3,768 | 4,535 | 3,167 | 1,749 |
| Other revenue/HH | 45 | 362 | 349 | 314 | 415 |
| Total revenue/HH | 5,389 | 5,830 | 5,872 | 4,795 | 3,567 |
| Residential tax rate | 0.85% | 0.88% | 0.97% | 1.00% | 1.02% |
| Percent of total levy | 30.10% | 36.00% | 81.70% | 73.00% | 60.00% |
| Commercial and industrial tax rate | 2.39% | 1.73% | 1.08% | 1.22% | 2.29% |
| Percent of total levy | 64.30% | 61.90% | 16.50% | 25.30% | 37.40% |
| Assessed residential value ($ billion) | 20.60% | 1.20% | 1.80% | 2.40% | 3.90% |
| Total assessed value ($ billion) | 35.80% | 2.40% | 2.20% | 3.10% | 5.00% |
| Residential taxes/HH | 623.00 | 1,358 | 3,706 | 2,313 | 1,050 |
| Estimated total payments/HH | 1,052 | 1,716 | 4,061 | 3,010 | 1,327 |
| Average single family property tax bill | 1,377 | 1,577 | 3.535 | 2,647 | 1,608 |

# 1). The Town Budget Identity

$$t = \frac{(G - A)}{P/(1-C)}$$

t = town residential effective tax rate

G = total town expenditure/household

A = state aid received/household

P = average market value of houses in town

C = % of total property value that is commercial (assumes C does not influence G)

*Hence Tax rates depend on housing prices*

2). **Capitalization:** Hedonic regression equation valuing PDV of town services (G) and tax payments (tP) in addition to housing characteristics (whose rent is R), [Bogart] . With complete capitalization the coefficient on services is 1/i and on *taxes* –1/i. Why?

$$P = [R+G - (tP)]/i$$

Then, on solving for price:

$$P = (R+G)/ (i+t)$$

*Hence Prices depend on tax rates*

Combining equations:

$$P = \frac{[R+G]}{i + (G-A)(1-C)/P}$$

*Easy* solution (!):

$$P = \frac{[R+CG+A(1-C)]}{i}$$

- Prices are higher when towns have more commercial property (C).
- Prices higher with more state aid (A).

*With an increase in either, taxes drop, causing prices to rise, causing taxes to drop further, but there is a solution.*

3). **Expenditure Decision**: what level of G maximizes the value of household assets?

- In the hedonic equation each dollar of spending increases P by 1/i dollars.

- However in the budget identity the cost of spending is *less* than 1/i because of C,A, etc. Hence the solution says spend away!

- More realistically, there is *diminishing marginal utility* from increased school spending and hence as G rises its impact on P becomes less than 1/i. [Bogart] .

# Fiscal Incentives with different uses

4). $$t = \frac{\sum_i U_i N_i - A}{\sum_i P_i N_i}$$

$U_i$ = Service usage by a property of use i

$N_i$ = Number of "properties" of each use

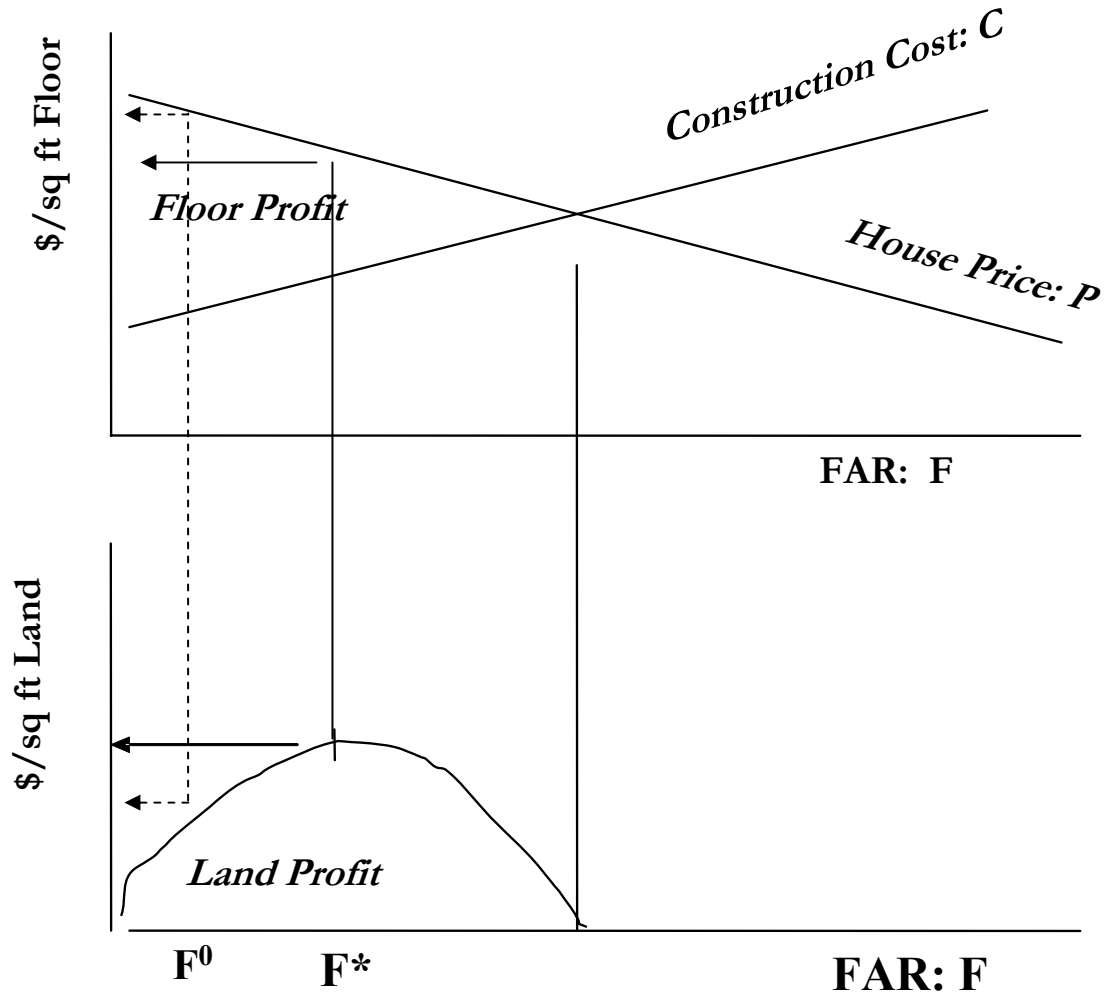
$P_i$ = average price of each property in use i

5). $\partial t / \partial N_i = [U_i - t P_i] / \sum_i P_i N_i$

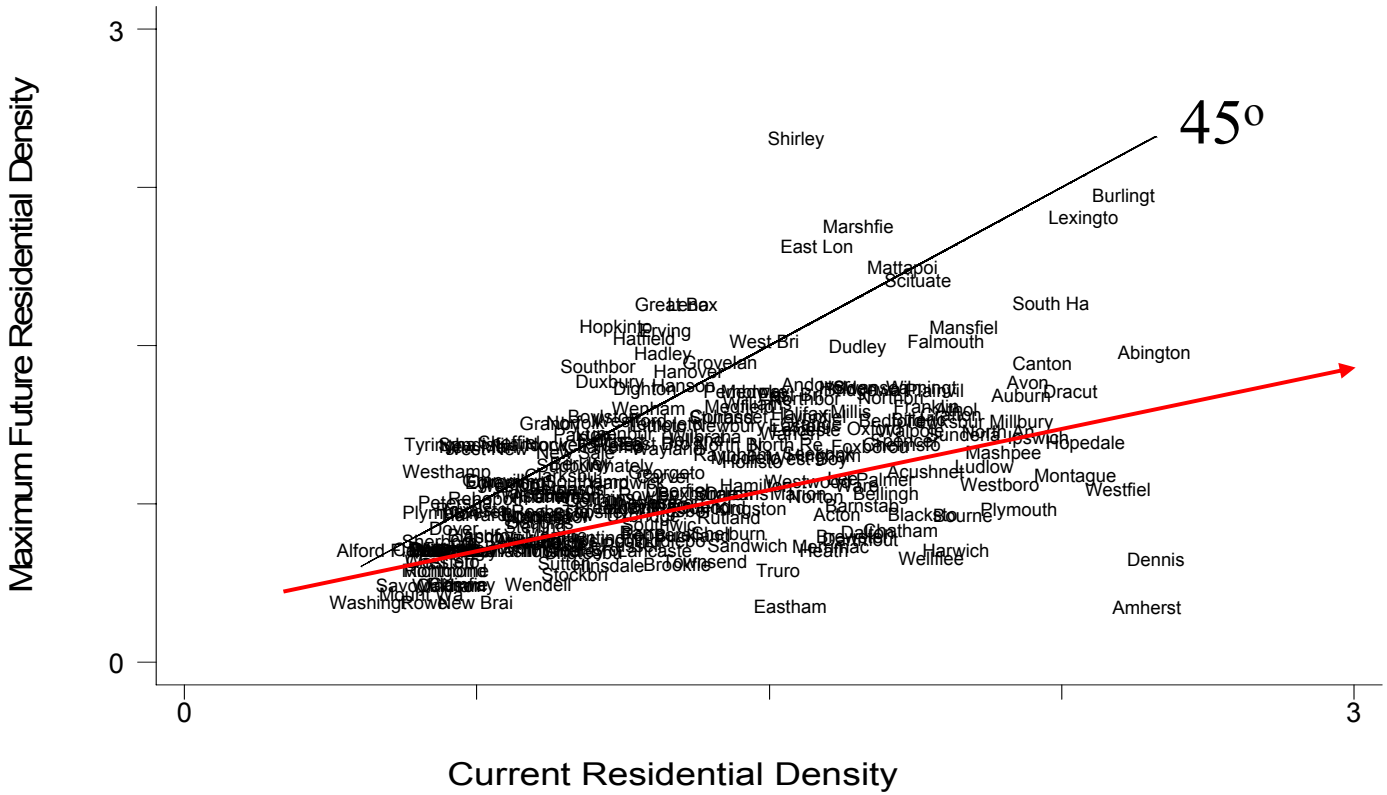
Who pays and who does not?

The unpleasant but real Incentives that towns face: $U_i$ versus $t P_i$.

**Down Zoning (lower FAR $F^0$ from F*): reduces the value of land but increases the value of the overall built property. Overall property value brings in taxes and benefits existing residents**



# Mass Town zoning: maximum build-out Density versus actual current density (red regression line)




Evenson and Wheaton, Brookings, 2003

6). Welfare cost of commercial use =

$$\partial t/\partial N_i \quad + \quad \text{Environmental cost}$$

$$= [U_i - t\,P_i\,]/\sum_i P_i N_i \quad + \quad (\partial E/\partial N_i)V$$

"Environmental Impact (-)" x

"valuation of impact"

7). Beneficial to the town (negative net cost) if t high and V low. Adverse (positive net cost) if t low and V high. But what towns would like does not equal what they can get.

# Waltham Project: City has 16.1m square feet of office/Industrial which are taxed at 2x residential and contribute 60%(!) of town property tax revenue . Alternative Budgets with New Development proposal and if Waltham had State averages.

**Table 1: Alternative Waltham Budgets**

| Budget Item | 2004 Actual | With New Development[1,2] | With State Average C&I Share[2,3] |
|---|---|---|---|
| Total Expend. | 119.0 | 121.0 | 109.0 |
| School Expend. | 49.1 | 50.1 | 45.1 |
| Safety Expend. | 24.5 | 25.0 | 22.5 |
| Residential Levy | 42.3 | 37.3 | 69.0 |
| C & I Levy | 57.0 | 64.0 | 22.0 |
| Personal Levy | 7.0 | 7.7 | 4.0 |
| Net State Aid[4] | 15.5 | 15.5 | 15.5 |
| Residential levy/ Household | 1750. | 1550. | 2850. |

1. 2.0 million new square feet of office space.
2. Assumes that 25% of commercial tax revenue augments spending, 75% adjusts taxes
3. State wide C&I share is 23% and Personal is 4% of Levy
4. Assumes that changes in property tax revenue do not alter state aid.

# Some "Issues"

- What about 2nd home properties? Towns on Cape Cod or cities in Florida.
- Some states have passed legislation that allows cities to tax commercial property at a fraction (higher or lower) than residential property. This is called "classification" (Waltham).
- If you are the mayor of a town would you tax the local industrial park higher or lower? What does the data show?
- What about rental property. What do tenant voters want [Oates]?

## Urban "Decay": the whole Philadelphia Story

- Middle class flight "starts" from the central city.
- Those left (the poor) have high service usage -vs- the property value they live in => taxes rise.
- Higher tax rates cause property values to fall.
- City enacts extra tax on those who *work* in city.
- Firms now must pay workers not only for higher commute in from suburbs but also for wage tax.
- Firms leave (C falls) and property tax rises further.
- With empty neighborhoods, crime rises, schools deteriorate => back to top.
- Why do the poor stay?

8). $P_k = \frac{R_k G - tP_k}{i}$ , k=L,M,H income

On solving for $P_k$:

$$= \frac{R_k G}{(i+t)}$$

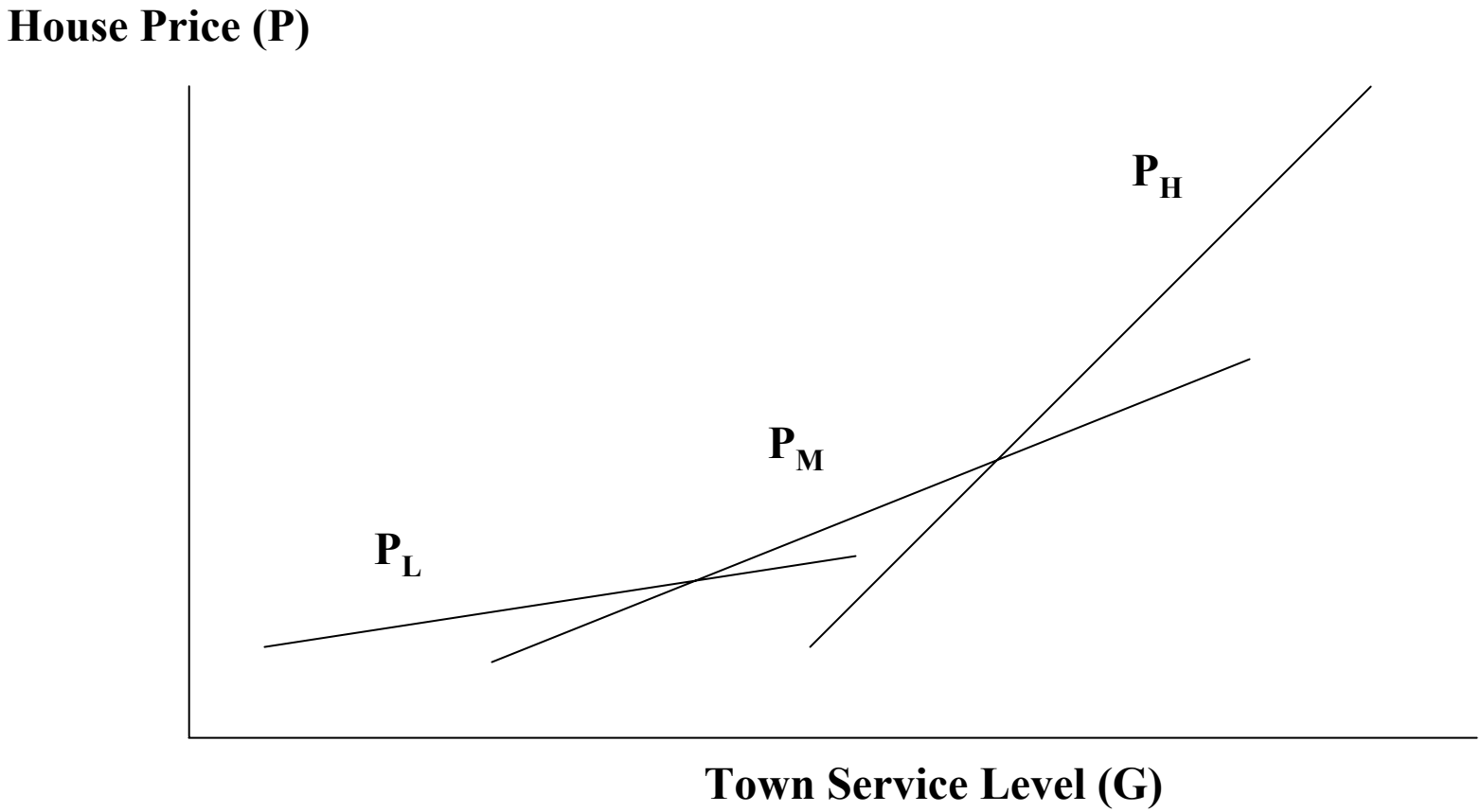
$R_k$ = willingness to pay for town services by households of each income level

[e.g. Bogart ]

9). *Short term* "Income Sorting" if:

$$R_L < R_M < R_H$$

How is it possible for higher income towns to "maintain" their higher income? Wealthier residents are willing to pay more for the better town services that accompany wealth



10). $p_k = \frac{P_k - C}{q_k} = \frac{R_k G}{q_k(i+t)} - \frac{C}{q_k}$,

k=L,M,H income households

11). *Long term* income sorting if:

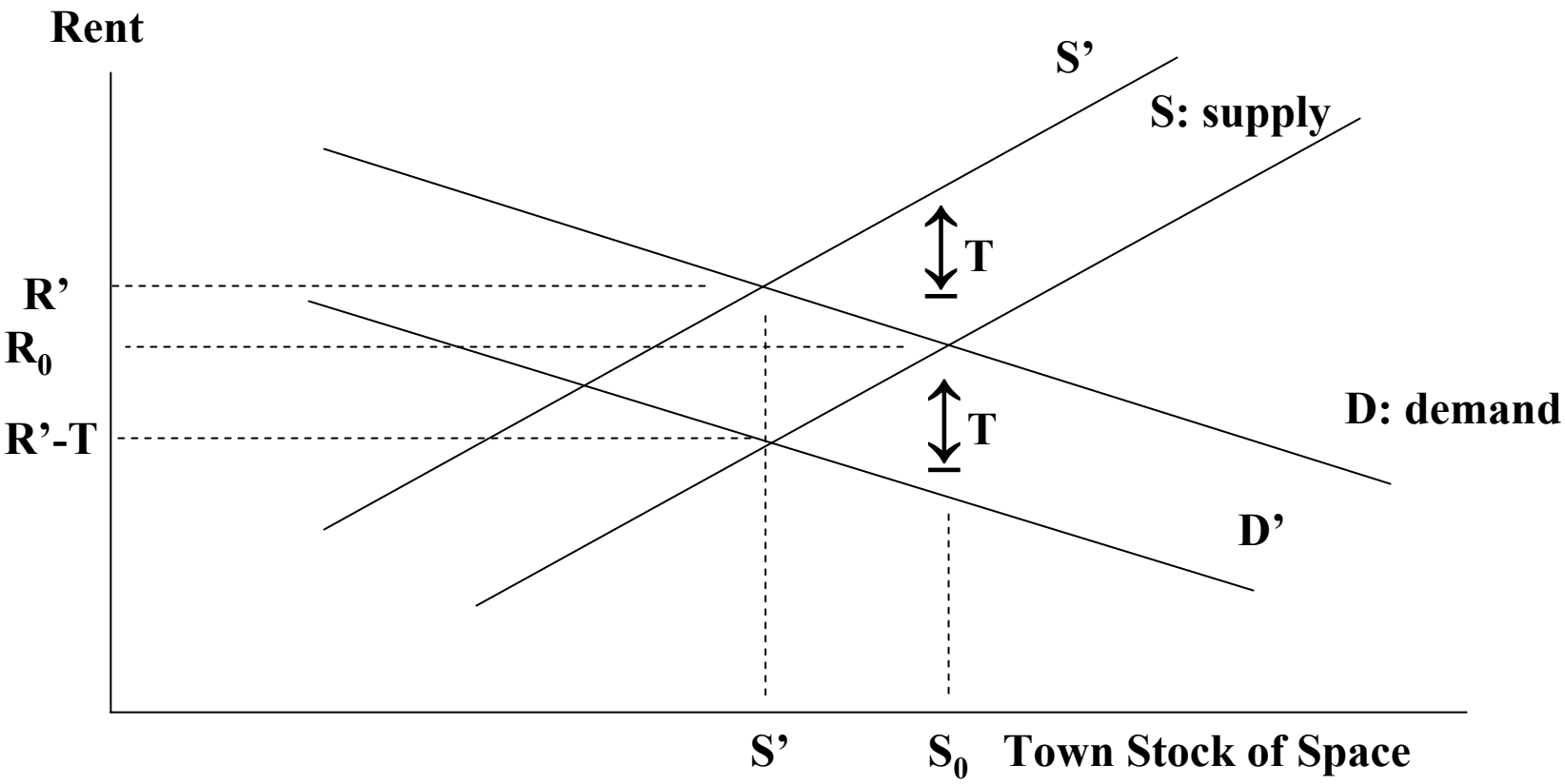
$$R_L/q_L < R_M/q_M < R_H/q_H$$

12). Would low income residents be willing to live at very high density in Weston? Sure!

13). Can they? Zoning requires $q_L = q_H$.

Building codes prohibit trailers!

**"Tax incidence". State aid is cut: (1) taxes rise by T and rents paid go from $R^0$ to R' while landlord receives R'-T, or (2) Services fall by T dollars, tenants lower their valuation for the town (D), rents paid and received go to R'-T**



# Tax Incidence: alternative outcomes

- Elastic demand, inelastic supply implies that R' is *not* much higher than $R^0$ => landlord absorbs the impact.
- Inelastic demand and elastic supply implies that R' *is* much higher than $R^0$ => tenant absorbs the impact
- Empirical Evidence: Apartment Rents?
- Empirical Evidence: Office Rents?

# Vermont Property Taxes: the Howard Dean story

- 1978: Vermont enacts a *statewide uniform* property tax to fund schools. Town taxes drop in poorer areas and rise in rich (resort) towns – as funds are transferred.
- 2003: New Legislation provides that 2nd homes will be taxed at **2x** primary residences for the state tax.
- Taxes in resort towns will now double and services stay the same (there are no schools in Killington, Vt.).
- Killington, Vt. Threatens to "secede" Vt. (and join New Hampshire).
- What will the tax incidence be? Structure? Land? Residence?
- Taxes do not depend on the structure per say, but who occupies it (resident or skier)!
- Residents can afford to pay more for any house than can a skier from NY! Stay Tuned.