Econ 330: Urban Economics

Lecture 09

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Lecture 09: Place Based Policies

Schedule

Today:

(i). Place-based policies

- General utility framework

Upcoming:

- **Reading** (Chapter 8)
- **PS03 will be posted later today**

Place-based polcies

Place-based polcies

<u>Definition:</u> Place-based policies - Location specific policies/laws

- What are some examples?

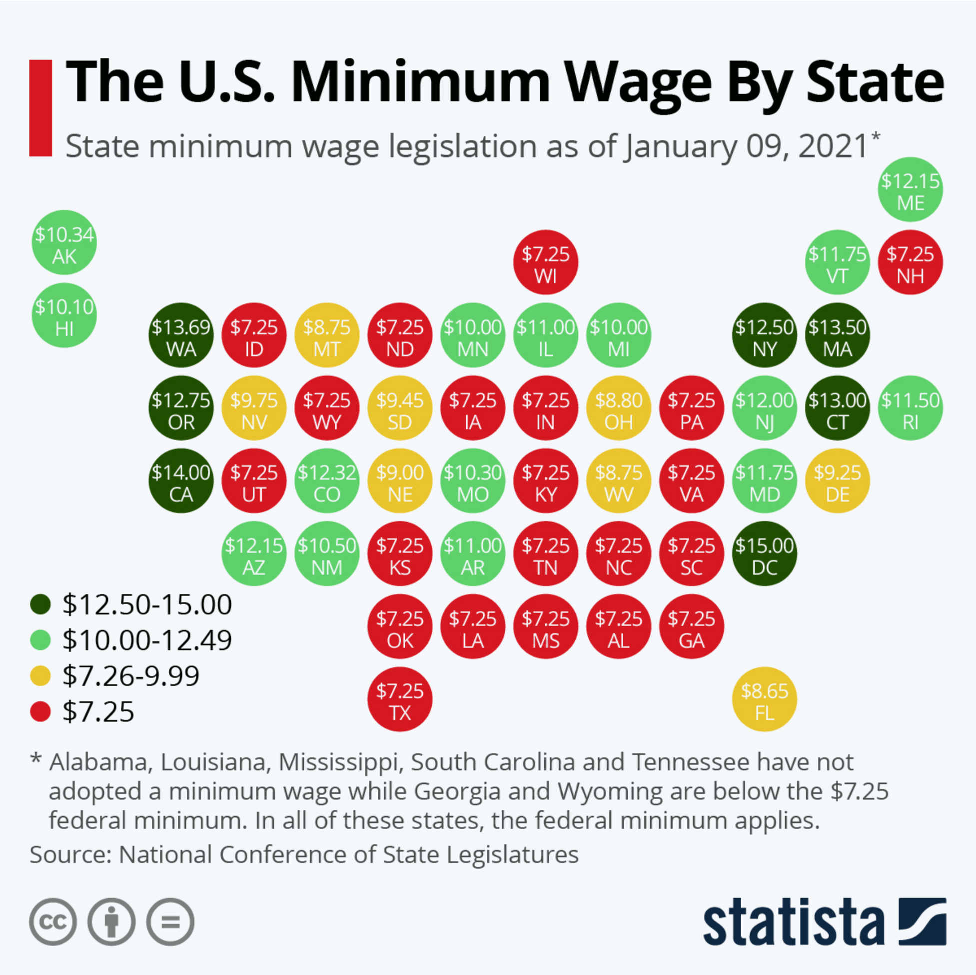
- State and Local Taxes
- State/City minimum wage
- Abortion restrictions
- Air quality monitoring
- Zoning & Land Use Restrictions
- Enterprise Zones
- Medicinal and recreational marijuana laws

Federal policies that are **uniform across all states** *are not* place-based

- Harder to migrate across **international borders** than state borders

Place-based polcies: Examples

Pb polcies: Minimum wage



Federal Minimum Wage: 7.25 (not a place based policy)

Pb polcies: Enterpise zones

<u>Definition:</u> Enterprise zone:

> A geographic area that has been granted tax breaks, regulatory exemptions, or other public assistance in order to encourage private economic development and job creation

Examples:

- Jersey City, NJ since 1983
- China: Shanghai and Shenzen (Special Economic Zones (SEZ))

Pb polcies: Brownfield remediation

<u>Definition:</u> Brownfield:

> A geographic area that has previously been developed land that is not currently in use due to industrial and/or commerical pollution

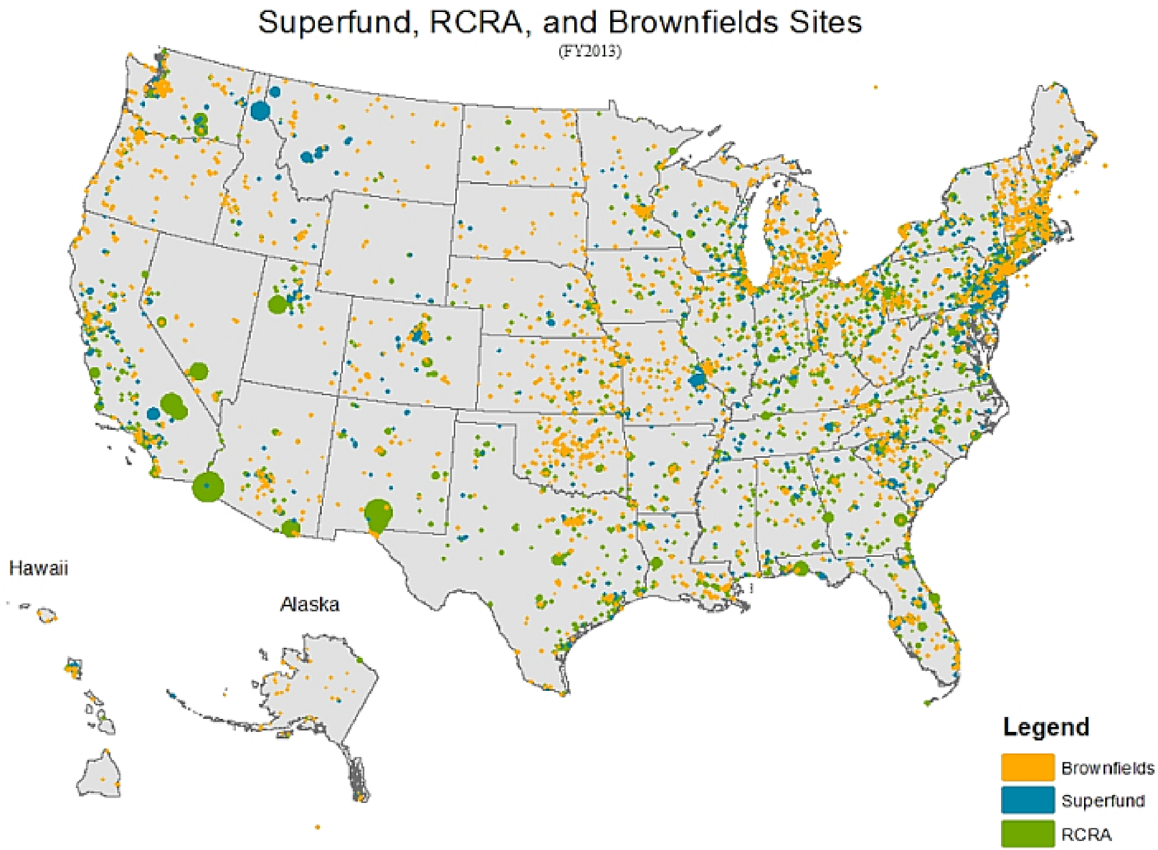
Examples include abandoned business such as:

- Gas stations
- Dry cleaning
- Factories
- Mills
- Foundries

There are several Brownfields in the Eugene/Springfield area

- Ninkasi over took a brownfield to expand brewing operations in 2012

Pb polcies: Brownfields remediation



Pb polcies: Brownfields remediation

Brownfields lower the amenity value of neighborhoods

- High health costs associated with living near a brownfield
    - Petroleum leaks from underground storage tanks lead to increases in the probability of low birth weights and preterm birth by **7-8 percent**
- Tremendously expensive to clean up

Land is not used it is not contributing to local economies- opportunity cost

Cleaning these up raises **amenity value** of the neighborhood

Property values around brownfields are far lower than comparable land

- What happens to property values? Go up
    - .hii[Gentrification]

Pb policies: Air quality

December 2, 1970: Environmental Protection Agency (EPA) is Established

- Included the Clean Air Act
  - Regulates county level air quality with a system of air monitors

Following years: amendments to the CAA

- **1990:** Additional power granted to state/local authorities to enforce air quality standards
- **1997:** PM 2.5 (particulate matter of 2.5 micrograms or less) standards placed
- **2005:** PM2.5 standards enforced
- **2011:** Standards for greenhouse gases

Pb polcies: Air quality

Particulate Matter (**PM**) in the US is regulated at the **county level**[†]

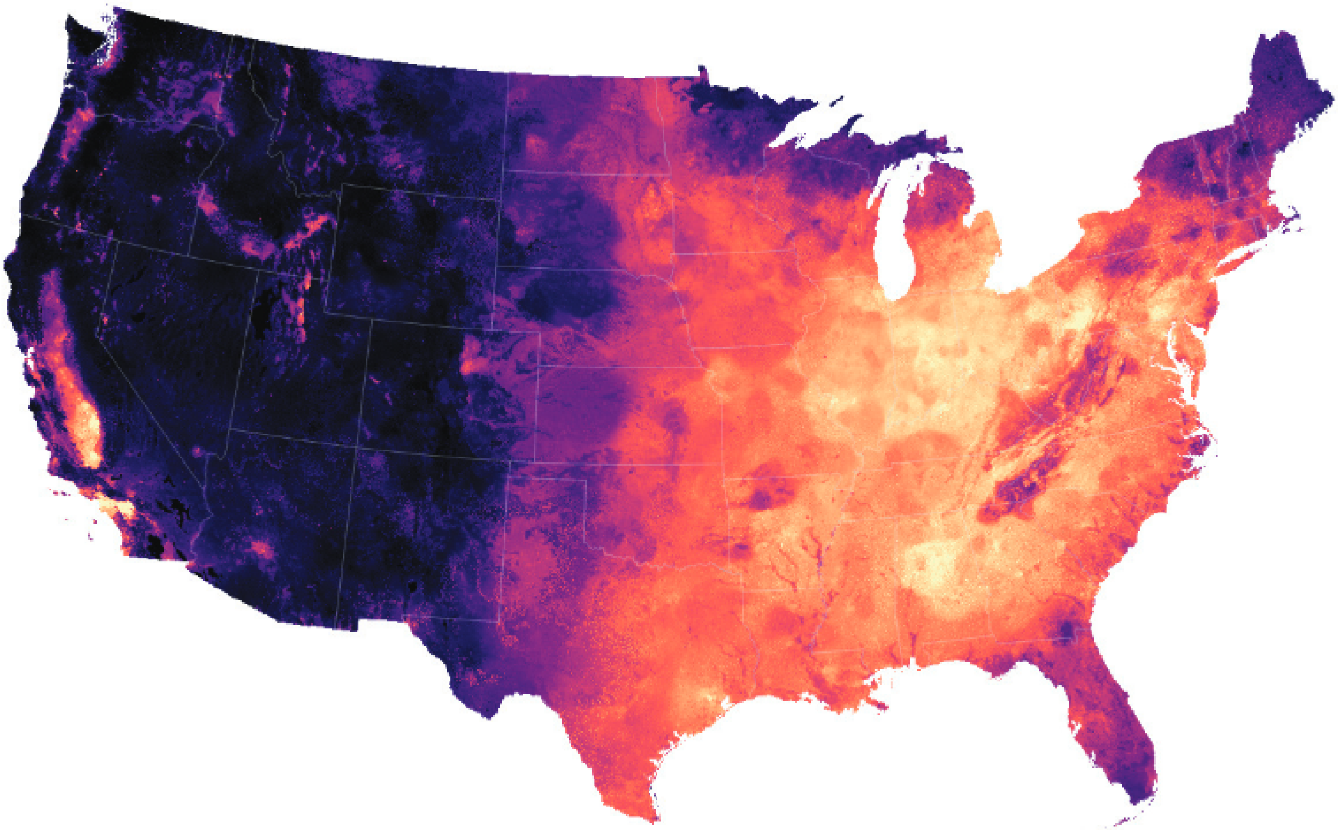
If a county exceeds certain threshold for **PM** , all firms over a certain size need to pay a pretty big fine

- Exceptions for fires, other natural events

† For more details, look here

Pb polcies: Air quality

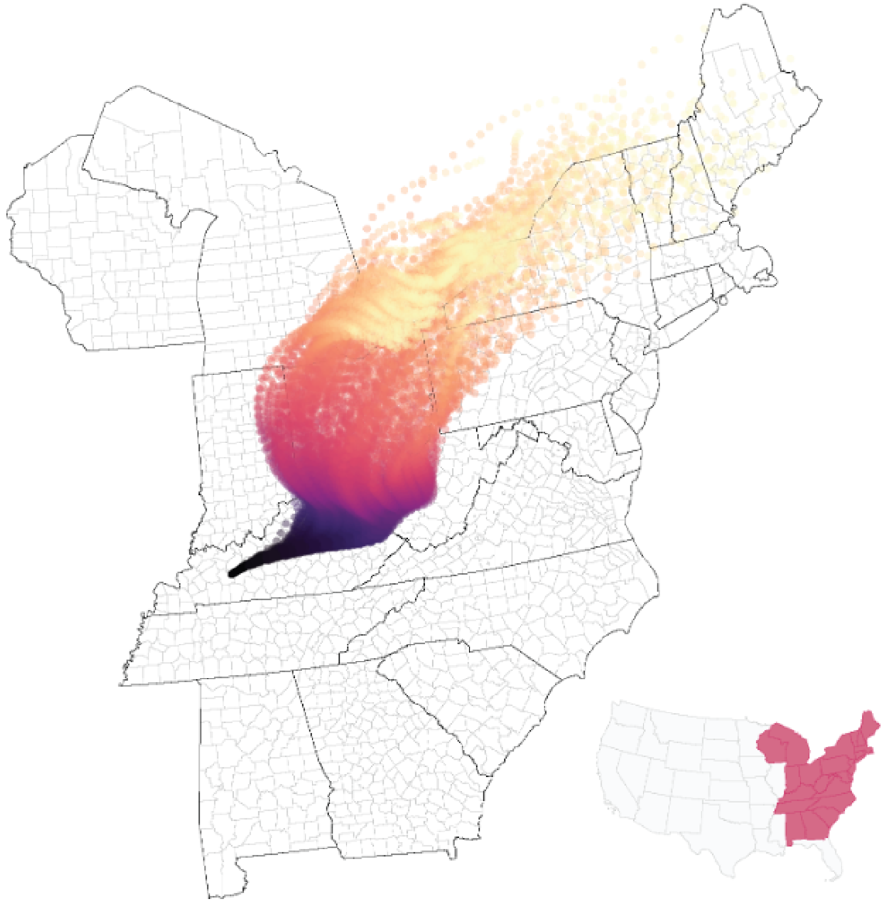
Pb polcies: Air quality



- Di et al. (2016)

Pb polcies: Air quality

Does air quality monitoring make sense at a local level? Why or why not?



Pb polcies: Discussion

Why do we care about place-based policies?

People are mobile and respond to changes in incentives

Place-based policies influence **location decisions**

- TotC give really good intuition in the chapter about Detroit.

Question: Why do federal policies impact cities differently?

Min wage: might be **binding** in some states, others not

- Some labor markets might be competitive. Others not
- Federal Income Tax: Cost of Living varies by state.

Utility framework

Utility framework

This next section of the class will add another layer of complexity

Set up a **utility framework** to understand how policies impact welfare -- Only scratches the surface of how one may model impacts of pb policy

Some of these examples are based on Mark Colas' notes

- Learn more about this in his 400 urban economics class

Utility framework

Utility: Abstract notions of people's preferences. **Why does it matter?**

Location based policies impact individual **location decisions**

- Model decision through the lens of an individual's utility (welfare)
- Higher utility is better
  - $U(\text{City A}) > U(\text{City B}) \implies$ Moving to City A

Suppose City B makes a policy change that raises wages

- Now $U(\text{City A}) < U(\text{City B}) \implies$ Moving to City B

Changes in a location based policy are going to change **incentives**

- eg. San Diego has extremely strict zoning restrictions

Zoning restrictions $\implies$ limited housing supply $\implies$ high rents $\implies$ "why do i live here.." $\implies$ move to Oregon

Utility framework

Example: Preferences over left-shoes and right-shoes may be expressed with the following utility function:

$$U(\textbf{left shoes}, \textbf{right shoes}) = \textbf{min}\,\{\textbf{left shoes}, \textbf{right shoes}\}$$

Q: In words, what does this say?

A: Another right shoe does nothing for me unless I get another left shoe

Q: Give the above utility function, which bundle would I rather consume?

$$\textbf{bundle 1} : (10000, 1) \qquad\qquad \textbf{bundle 2} : (2, 2)$$

A: $U(10000, 1) = 1 < U(2, 2) = 2$, so I would rather consume bundle 2

Utility framework

Main point: Utility is used to rank outcomes

Remember: Utility is **ordinal** *not* **cardinal**

This means: we can only speak to the ordering of outcomes, not the levels

- Many utility functions give equivalent preference rankings

What if utility over shoes was:

$$U_2(\text{left shoes}, \text{right shoes}) = 10 * \min\{\text{left shoes}, \text{right shoes}\}$$

Q: Does this represent the same underlying preferences as before?

A: Yes, because $U_2(10000, 1) = 10 * 1 = 10 < U_2(2, 2) = 10 * 2 = 20$

- So the bundle $(2, 2)$ is still preferred to $(10000, 1)$

Utility framework: Locations

Could we write a utility function over locations?

Yes!

What would a locational utility function take as **inputs?**

What do people make location decisions on?

For now, assume people only care about 3 features of locations:

wages, **rents**, **amenites**

These all vary across locations, right? (first part of this class)

Let w_j, r_j, and a_j denote wages, rents, and amenities in location j

Utility framework: Locations

Let w_j, r_j, and a_j denote wages, rents, and amenities in location j

- $j = SF$, for example

General form: $U(w_j, r_j, a_j) = U_j$

- This says utility in location j is a function of wages, rents, and amenities, in location j

In practice, could write down an infinite number of functions for $U(\cdot)$

Usual assumptions:

- Higher wages are better
- Lower rents are better
- More amenities are better

Is this reasonable?

Utility framework: Locations

Example: Assume linear utility functions and everyone is identical:

$$U(w_j, r_j, a_j) = w_j - .5 * r_j + a_j$$

Suppose our two locations are SF and OAK again. If:

- $w_{SF} = 10, r_{SF} = 8, a_{SF} = 4$
- $w_{OAK} = 8, r_{OAK} = 3, a_{OAK} = 1$

Q How do workers sort across the cities?

- $U(w_{SF}, r_{SF}, a_{SF}) = 10 - .5 * 8 + 4 = 10$
- $U(w_{OAK}, r_{OAK}, a_{OAK}) = 8 - .5 * 3 + 1 = 7.5$

Well 10 > 7.5 so... everyone moves to SF

Utility framework: Locations

Is it reasonable that everyone would move to SF? What are we missing?

Was that last example an example in locational equilibrium?

No!

In **locational equilibrium**, utility is **equalized across locations**

Can't have: $U(w_{SF}, r_{SF}, a_{SF}) > U(w_{OAK}, r_{OAK}, a_{OAK})$

How can we use locational eq to "fix up" our last example?

We can **allow rents** (or wages or both) **to adjust** such that utility is equivalent across the two cities

Utility framework: Locations

Another Problem: People move and utility is equal across all locations

Thus far, we assume **wages** and **rents** are exogenous

- Fall from the sky, do not change with location decisions

This is a **bad assumption** right?

Let rents, but not wages, adjust to individual location decisions

- Make rents **endogenous** to the model

Utility framework: Rents

Rents in every city given by:

$$r_j(L_j) = 2 \times L_j$$

- $r_j(L_j)$: rents *are a function* of the population (not multiplied)
- L_j is the pop in city j; choosing 2 was arbitrary

Suppose we have two cities 1 and 2, with 7 people total: $L_1 + L_2 = 7$

Utility: $U(w_j, r_j(L_j), a_j) = w_j - .5 \times r_j(L_j) + a_j$

Wages: $w_1 = 12$, $w_2 = 7$

Rents: $r_j(L_j) = 2 * L_j$

Amenities: $a_1 = a_2 = 0$

Utility framework: Rents example

Suppose we have two cities $\mathbf{1}$ and $\mathbf{2}$, with 7 people total: $L_1 + L_2 = 7$

Utility: $U(w_j, r_j(L_j), a_j) = w_j - .5 \times r_j(L_j) + a_j$

Wages: $w_1 = 12$, $w_2 = 7$

Rents: $r_j(L_j) = 2 * L_j$

Amenities: $a_1 = a_2 = 0$

Qs: How many people live in each city? What are rents in each city?

Note: You have **two equations** and **two unknowns** (namely, L_1 and L_2)

- $U(w_1, r_1(L_1), a_1) = U(w_2, r_2(L_1), a_2)$ (from locational eq)
- $L_1 + L_2 = 7$ you know the total population

Utility framework: Rents example

Locational eq gives:

$$\begin{aligned} w_1 - .5 * r_1(L_1) &= w_2 - .5 * r_1(L_2) \\ 12 - .5 * (2 * L_1) &= 7 - .5 * (2 * L_2) \\ -L_1 &= -5 - L_2 \\ L_1 &= 5 + L_2 \end{aligned}$$

Population must sum to 7. Thus:

$$\begin{aligned} L_1 + L_2 &= 7 \\ 5 + L_2 + L_2 &= 7 \\ 2 * L_2 &= 2 \\ L_2 = 1 \implies L_1 &= 6 \end{aligned}$$

Utility framework: Place based policies

Ok, how do we tie this back into **place-based** policies?

Example

Initial equilibrium: $U(w_j, r_j(L_j), a_j) = k$ for all cities j

Suppose SF implements a 30%, flat, income tax

- Post-tax wage in city SF is now $w_{SF}^{tax} = 0.7 * w_{SF}$
- Assume **wages are fixed**, but **rents adjust to population**

Utility in city j is:

$$U(w_{SF}^{tax}, r_{SF}(L_{SF}), a_{SF}) < U(w_{SF}, r_{SF}(L_{SF}), a_{SF})$$

If utility is **increasing in wages**, then an income-tax lowers utility.

Utility framework: Equilibrium

Can it be an equilibrium if:

$$U(w_{SF}^{tax}, r_{SF}(L_{SF}), a_{SF}) < U(w_{SF}, r_{SF}(L_{SF}), a_{SF})$$

No!

Because $U(w_{SF}, r_{SF}(L_{SF}), a_{SF}) = k$

So $U(w_{SF}^{tax}, r_{SF}(L_{SF}), a_{SF}) \neq k$

Thus people move **away from SF** and rents fall

So utility goes up in SF until $U(w_{SF}^{tax}, r_{SF}(L_{SF}), a_{SF}) = k$

Extensions

This flexible way of modeling gives us many options for modeling place based policies

- Other kind of subsidies/taxes: goes into w_j
- Rent subsidies or property taxes: impacts r_j
- Q: How would you model an increase in public school quality?

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