Econ 330: Urban Economics

Lecture 09

Andrew Dickinson
18 November, 2021

Lecture 09: Place Based Policies

Schedule

Today:

(i). Place-based policies

- General utility framework

Upcoming:

- **Reading** (Chapter 7)
- **PS03 will be posted later today**

Place-based polcies

Place-based polcies

Definition: Place-based policies - Location specific policies/laws

- What are some examples?

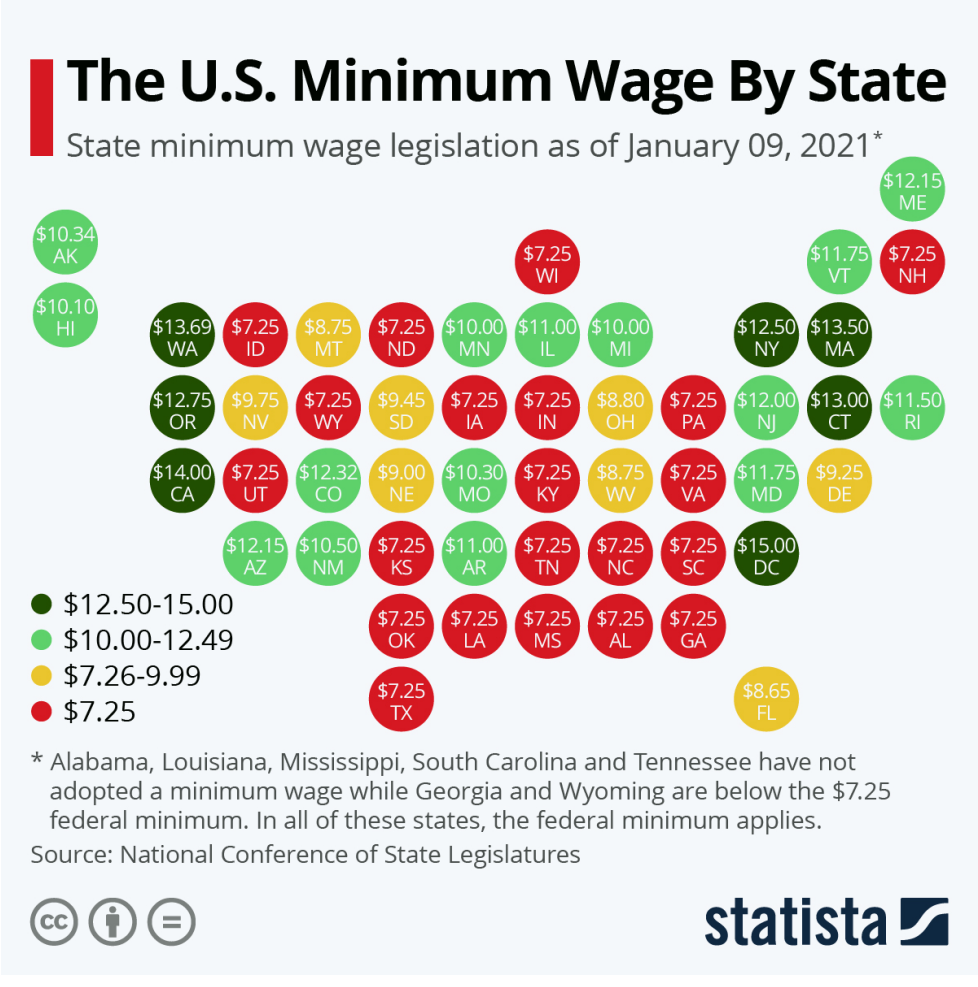
- State and Local Taxes
- State/City minimum wage
- Abortion restrictions
- Air quality monitoring
- Zoning & Land Use Restrictions
- Enterprise Zones
- Medicinal and recreational marijuana laws

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

Place-based polcies: Minimum wage



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

Place-based polcies: Enterpise zones

Definition: 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))

Place-based polcies: Brownfields

Definition: Brownfield:

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

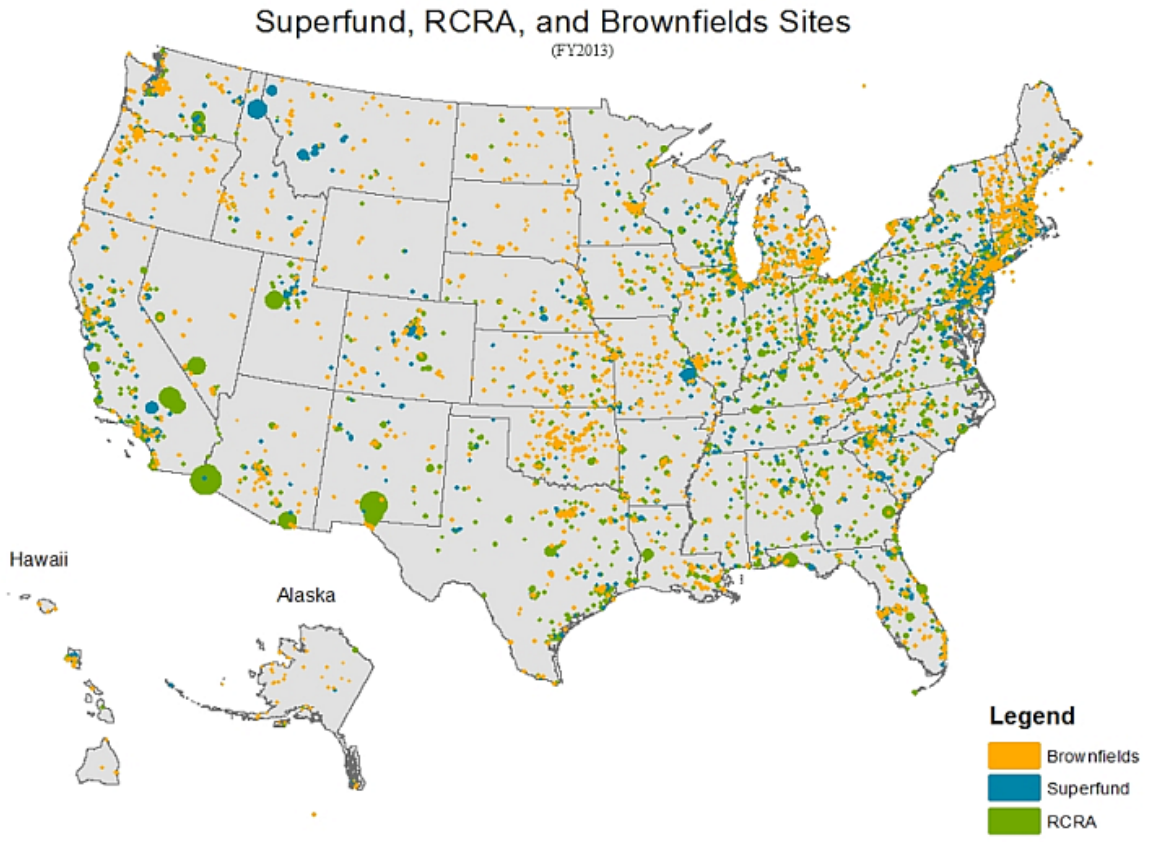
Examples include abandoned business such as:

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

There are several Brownfields in the Eugene/Springfield area

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

Place-based polcies: Brownfields



Place-based polcies: Brownfields

Brownfields are tremendously expensive to clean up

Furthermore, since the land is no longer being used it is not contributing to local economies

High health costs associated with living near a brownfield

- Recent publication found that petroleum leaks from underground storage tanks lead to increases in the probability of low birth weights and preterm birth by **7-8 percent**

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; gentrify

Place-based polcies: Air quality

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

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

Following years: amendments to the CAA (expanding scale and scope of EPA)

- **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

Place-based polcies: Air quality

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

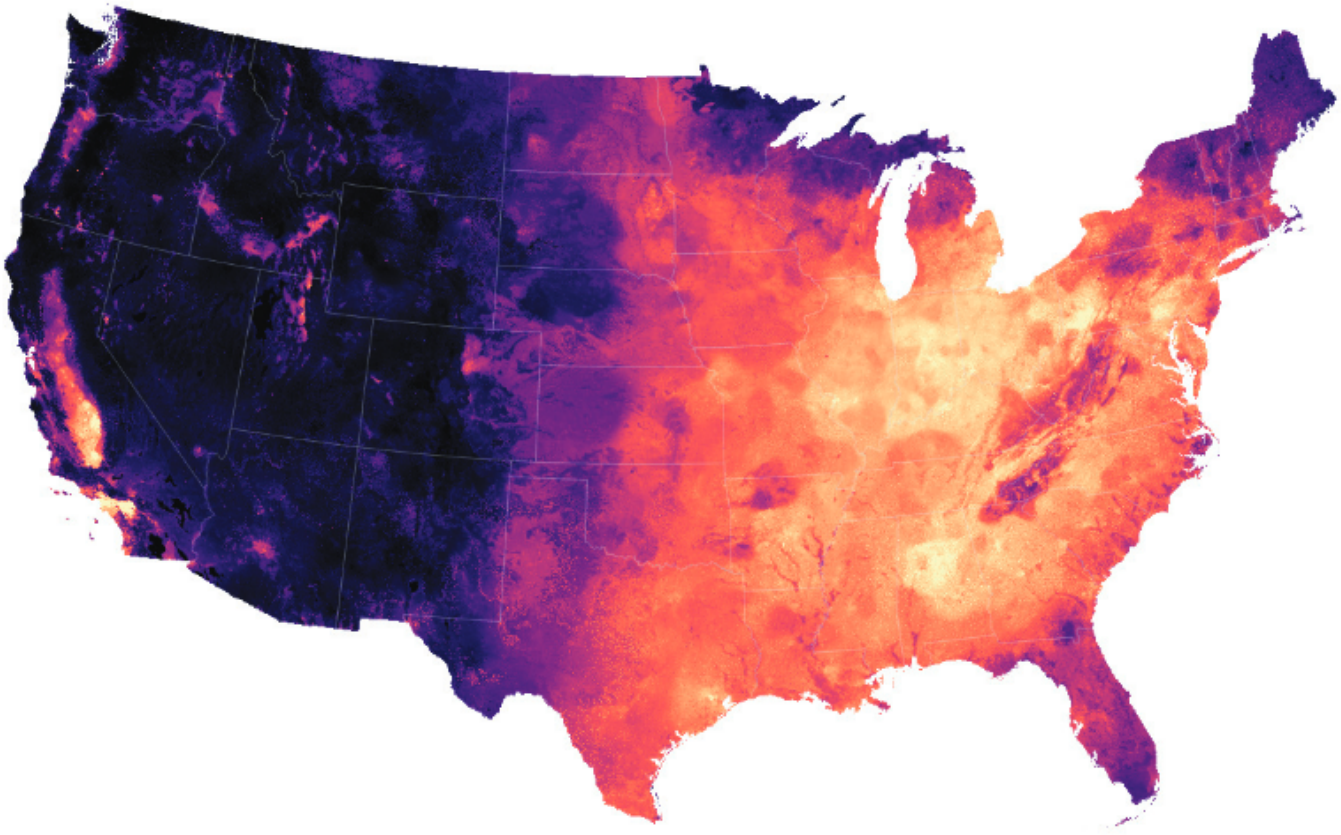
If a county exceeds certain threshold for **PM** , all firms over a certain size need to pay a pretty big fine

- Exceptions for fires, other natural events

† For more details, look here

Place-based polcies: Air quality

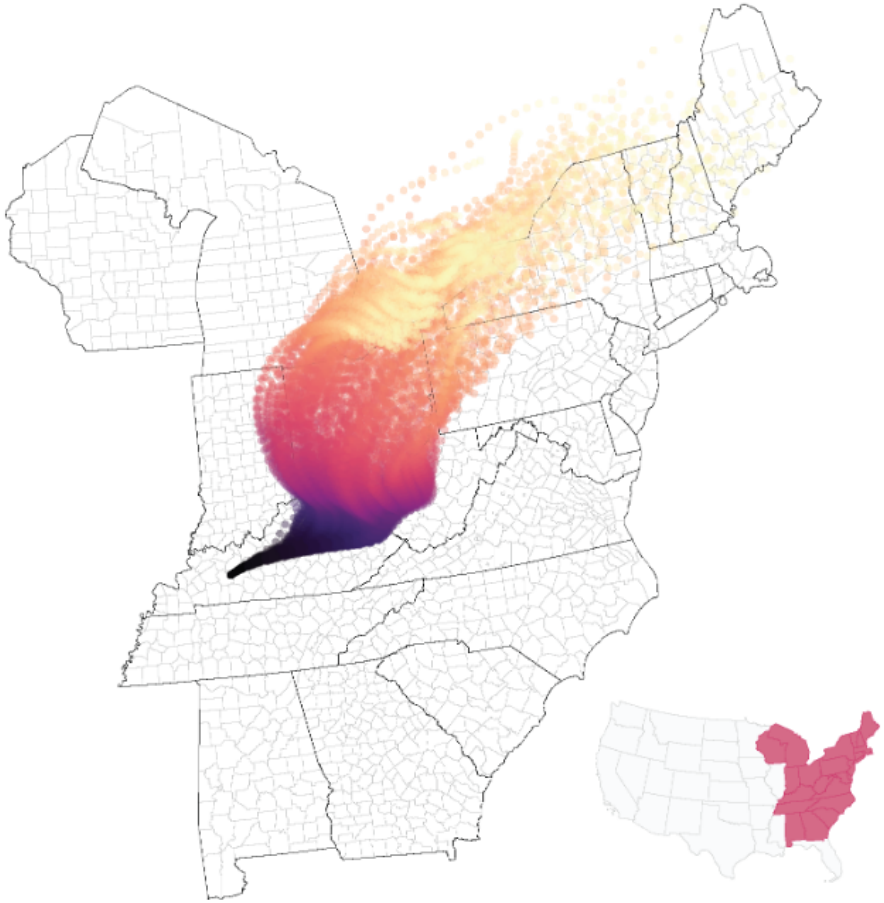
Place-based polcies: Air quality



- Di et al. (2016)

Place-based polcies: Air quality

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



Place-based 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

- Only scratches the surface of how one may **model the effects** of a place-based policy

Set up a **utility framework** to understand how policies impact welfare

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 $\implies$ move to Oregon

Utility framework

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

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

Q: In words, what does this say?

A: One more right shoe does nothing for me unless I get one more left shoe

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

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

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 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: $a_1 = a_2 = 0$

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?

Fin