Lecture 4: Urban Amenities

WWS 582a

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Introduction

- Role of urban density in facilitating consumption has been found to be important: agglomeration force
- Other urban amenities are important as well: like weather, shores, lakes, rivers, etc.
- In the literature these forces have in general played a secondary role
- However, the evidence seems to suggest that they are becoming more important over time
  - Modern city based on amenities?
  - Role of ICT?
- Glaeser, Kolko, and Saiz (2001) is one of the first papers to document this empirically in a robust way

Glaeser, Kolko, and Saiz (2001)

- Four critical urban amenities:

1. Presence of a variety of services and consumer goods
   1. Cities with more restaurants and theaters have grown faster
   2. In cities with more educated populations rent growth is faster than wage growth since 1970
2. Aesthetics and Physical Characteristics
   1. Weather is the main determinant of population or housing price growth
3. Public Services
   1. More crime leads to less urban growth
4. Speed
   1. Higher value of time leads to higher rents in areas with easy access

Stylized facts: Reverse Commuting

TABLE 1

Commuting patterns - US Metropolitan Areas

	Daily Commutes (millions)			Annualized growth rate	
	1960	**1980**	**1990**	**80-60**	**90-80**
City-city	**18.8**	**20.9**	**24.3**	**0.52%**	**1.52%**
City-suburb	**2.0**	**4.2**	**5.9**	**3.65%**	**3.46%**
City-other	**0.6**	**1.2**	**1.9**	**3.63%**	**4.70%**
Suburb-city	**6.6**	**12.7**	**15.2**	**3.34%**	**1.81%**
Suburb-suburb	11.3	**25.3**	**35.4**	**4.09%**	**3.42%**
Suburb-other	1.1	**3.7**	**6.8**	**6.22%**	**6.27%**
Total	**40.5**	**68.0**	**89.5**	**2.62%**	**2.79%**

Source : Commuting in America. ENO Transportation Foundation

Stylized facts: Reverse Commuting

TABLE 2

Reverse commuting in the San Francisco Bay Area Counties

	% change of employment in county (1)	% change of employees living in county (2)	(2)-(1)
San Francisco	9.2%	14.5%	5.3%
San Mateo	22.0%	14.0%	-7.9%
Santa Clara	25.1%	22.1%	-3.0%
Alameda	21.5%	24.7%	3.1%
Contra Costa	47.1%	33.7%	-13.5%
Solano	35.5%	57.0%	21.5%
Napa	33.6%	24.9%	-8.7%
Sonoma	51.0%	51.0%	***0.0%***
Marin	24.7%	8.7%	-16.0%

Source : Census Tabulations from the Metropolitan Transportation Comission, San Francisco Bay Area

Stylized facts: The Success of High Amenity Cities

TABLE 3

Population growth and amenities

	Population Growth	
UNITED STATES (77-95)	**Estimate**	**t-value**
Temperate climate	0.35	17.8
Proximity to ocean coast	0.24	12.5
Live performance venues per capita	0.14	6
Dry climate	0.12	6.5
Restaurants per capita	0.05	2.9
Art museums per capita	-0.03	-1.5
Movie theaters per capita	-0.05	-2.6
Bowling alleys per capita	-0.19	-11.3
FRANCE (1975-1990)		
Restaurants per capita	0.45	5
Hotel rooms per capita	0.33	4
ENGLAND (1981-1997)		
Tourist nights per capita	0.31	2.7

Notes : Each coeffkient is the result of a separate regression of population growth on each amenity and other controls. The values of the variables were transformed to have standard error=1. The temperate climate variable is the inverse of (average temperature per year-70 degrees). All temperatures are measured in Farenheit degrees. Dry climate stands for the inverse of average precipitation. US regressions included controls for county density, share of college educated, and a shift-share industry growth measure. France observation units are the "Zones d'Emploi". France regressions included controls for participation rate and population in 1975. The England regression is for counties, as defined in the Data Appendix. The England regression included a dummy for Northern counties and initial population as controls.

Stylized facts: The Success of High Amenity Cities

TABLE 4

Ranking of Top and Bottom US MSA's, according to Estimated Amenity Value

Metropolitan Statistical Area (MSA)

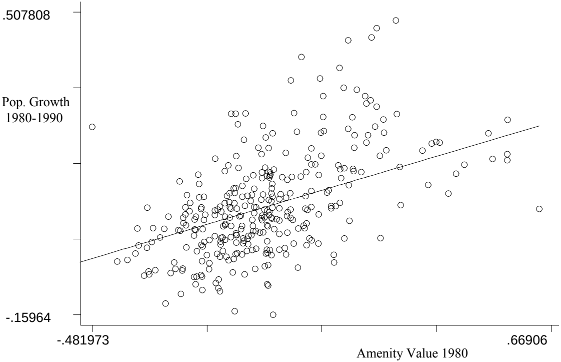
Highest	**Lowest**
Honolulu, HI	Stamford, CT
Santa Cruz, CA	Norwalk, CT
Santa Barbara-Santa Maria-Lompoc, CA	Anchorage, AK
Salinas-Seaside-Monterey, CA	Rochester, MN
Los Angeles-Long Beach, CA	Detroit, MI
San Francisco, CA	Midland, TX
San Jose, CA	Trenton, NJ
Santa Rosa-Petaluma, CA	Minneapolis-St.Paul, MN
Oxnard-Ventura, CA	Nassau-Suffolk, NY
San Diego, CA	Bloomington-Normal, IL

Notes : Estimated Amenity Value measured as residual from an OLS regression of log median house value on log median income in 1990.

Stylized facts: The Success of High Amenity Cities

Figure 1

Growth and Amenities in the US



Stylized facts: The Demand for Urban Amenities is Rising

TABLE 5

Correlation between estimated amenity value and population

		Amenity-Population correlation
US	1980	0.22
	1990	0.36

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TABLE 6

Elasticities with respect to population size

		wages	housing prices
U S	**1980**	0.05 1	0.114
	1990	0.082	0.225
		wages	**housing rents**
England	**1988**	0.047	0.036
	1998	0.072	0.021

Notes: Population at the MSA level for US, county level for England. See Data Appendix for data description.

Stylized facts: The Demand for Urban Amenities is Rising

TABLE 7

Wage and rent growth in Paris and London

	Wage growth	Rent growth
ENGLAND (1988- 1998)		
London	**4.90%**	**8.60%**
Rest of England	**4.70%**	**7.50%**
Difference-in-difference (London amenity premium)		**0.90%**
FRANCE (1990-1995)		
Paris	**3.60%**	**4.20%**
rest of France	**4.00%**	**3.50%**
difference-in-difference (Paris amenity premium)		*1.10%*

Notes : Annualized growth rates. See Data Appendix for data sources

Stylized facts: The Demand for Urban Amenities is Rising

TABLE 8

Income and housing value growth in selected American cities

	1993-1998		
	Income growth	**Home value growth**	**Difference**
San Francisco	2.46%	4.51%	2.05%
Boston	3.11%	4.65%	1.54%
Chicago	3.64%	3.76%	0.12%
New York City	***2.69%***	2.57%	-0.12%
Los Angeles	1.82%	1.21%	-0.61%
Washington, DC	3.83%	1.12%	-2.71%

Notes: Annual growth rates over the 1993-1998 period

Stylized facts: Increasing Wealth of the Inner City

TABLE 9

Population distribution within the city

Panel A: All MSAs

Share of City Population Living:	*1980*	*1990*
Within one mile of CBD	10.70%	10.30%
One to three miles of CBD	*35.50%*	*34.00%*
Three to five miles of CBD	21.90%	21.80%
Beyond five miles of CBD	31.90%	33.90%

Panel B: 10 biggest MSAs

Share of City Population Living:	*1980*	*1990*
Within one mile of CBD	*4.80%*	*4.90%*
One to three miles of CBD	17.00%	16.50%
Three to five miles of CBD	19.00%	*18.40%*
Beyond five miles of CBD	**59.20%**	*60.20%*

Notes : See data Appendix for data sources.

Stylized facts: Increasing Wealth of the Inner City

TABLE 10

Income distribution within the city

Panel A: All MSAs

Income Relative to City Average	***1980***	***1990***
Within one mile of CBD	**89%**	**94%**
One to three miles of CBD	**95%**	**95%**
Three to five miles of CBD	101%	100%
Beyond five miles of CBD	109%	107%

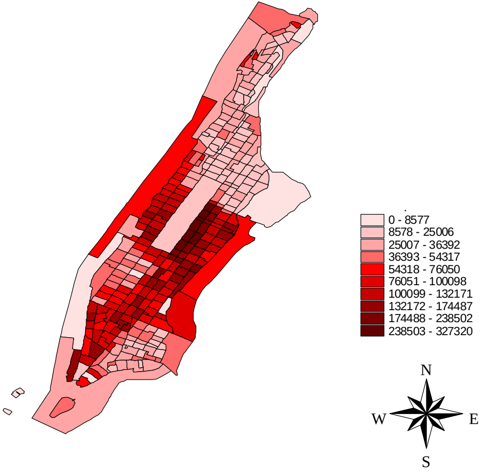
Panel B: 10 biggest MSAs

Income Relative to City Average	***1980***	***1990***
Within one mile of CBD	144%	163%
One to three miles of CBD	**88%**	**97%**
Three to five miles of CBD	**86%**	**86%**
Beyond five miles of CBD	105%	100%

Notes : See data Appendix for data sources.

Stylized facts: Increasing Wealth of the Inner City

- Manhattan: median income by tract, 1990



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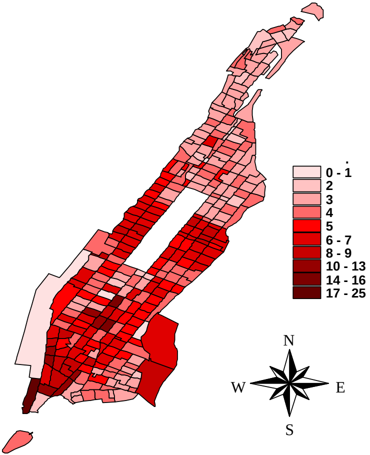
- Manhattan: income1990/income1970



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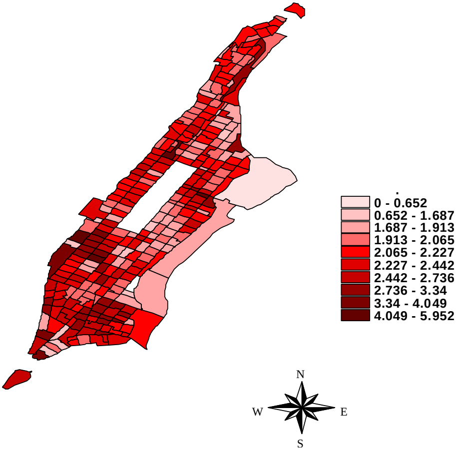
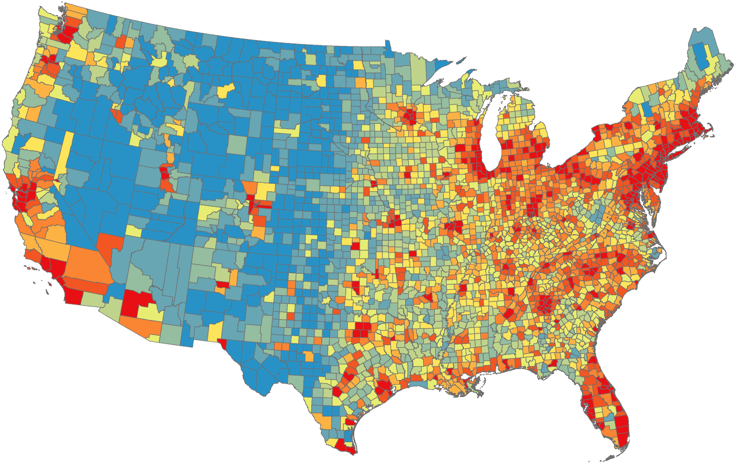
- Manhattan: median rent 1990/median rent 1980



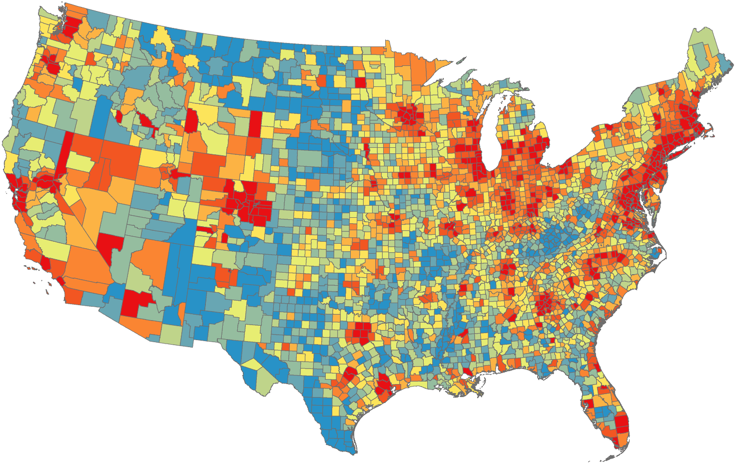
Estmating Productivity and Amenities for US Counties

- Can identify a topography of productivities A and amenities u consistent with estimates transport costs and observed distribution of economic activity (wages, w, and population, L)
  - Use model in Allen and Arkolakis (2014)
- Intuition: consider locations i and j with identical bilateral trade costs.Then since $\bar{u} = \frac{w(i)}{P(i)} a(i)$
  - Utility equalization implies $\frac{a(i)}{a(j)} = \frac{w(j)/P(j)}{w(i)/P(i)}$.
  - Balanced trade identifies $\frac{A(i)}{A(j)}$
- Note: $\bar{A}$ and $\bar{u}$ cannot be identified without knowledge of externality elasticity (α for production, β for amenities)

Observed L

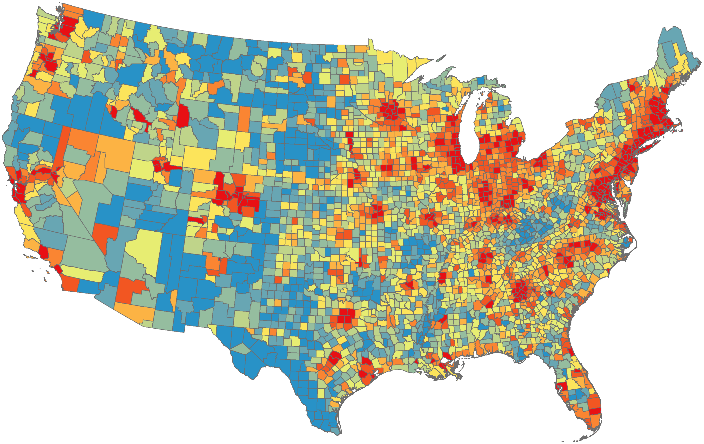


Observed w



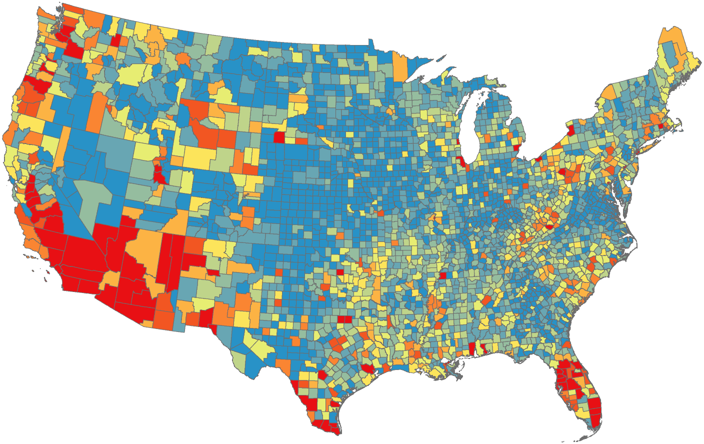
Productivity

- $\alpha = 0.1$



Amenities

- $\beta = -0.3$



Moving to Nice Weather (Rappaport, 2007)

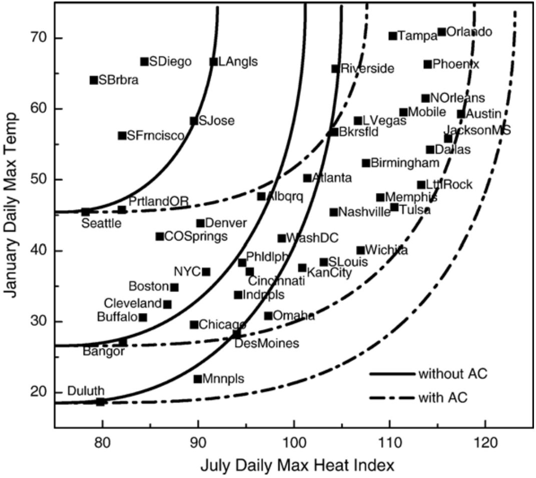


Fig. 1. Iso-utility over weather.

Moving to Nice Weather

Table 3
Population growth and weather

		(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable →		Annual population growth rate, 1970 to 2000					
Independent variables ↓							
Coast/river/topography (7)		No	Yes	Yes	Yes	Yes	Yes
Initial density spline (7)		No	No	Yes	Yes	Yes	Yes
Concentric total pop (7)		No	No	Yes	Yes	Yes	Yes
Ag/mnrl/mnfct (17)		No	No	No	Yes	Yes	Yes
Census divisions (8)		No	No	No	No	Yes	No
Weighted regression		No	No	No	No	No	yes
January daily max temp	Linear	***0.0751***	***0.0663***	***0.0655***	***0.0513***	***0.0497***	***0.0488***
		(0.0098)	***(0.0104)***	***(0.0099)***	***(0.0093)***	***(0.0099)***	***(0.0092)***
	Quadratic	***0.0012***	***0.0012***	***0.0014***	***0.0013***	***0.0016***	***0.0013***
		(0.0004)	***(0.0004)***	***(0.0004)***	***(0.0003)***	***(0.0003)***	***(0.0003)***
July daily heat index	Linear	***−0.0626***	***−0.0508***	***−0.0505***	*−0.0215*	***−0.0242***	−0.0170
		(0.0116)	***(0.0127)***	***(0.0126)***	*(0.0112)*	***(0.0114)***	(0.0114)
	Quadratic	−0.0002	−0.0003	0.0004	−0.0006	−0.0002	−0.0008
		(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)
July daily rel humidity	Linear	***−0.0371***	***−0.0410***	***−0.0621***	***−0.0395***	***−0.0549***	***−0.0385***
		(0.0142)	***(0.0147)***	***(0.0162)***	***(0.0129)***	***(0.0132)***	***(0.0123)***
	Quadratic	0.0005	0.0006	−0.0001	−0.0003	***−0.0008***	−0.0003
		(0.0005)	(0.0005)	(0.0004)	(0.0004)	***(0.0003)***	(0.0004)
Annual precipitation	Linear	***0.0216***	***0.0231***	0.0153	−0.0044	−0.0029	−0.0048
		(0.0107)	***(0.0107)***	(0.0100)	(0.0082)	(0.0087)	(0.0080)
	Quadratic	−0.0004	−0.0004	0.0001	0.0002	0.0002	0.0002
		(0.0002)	(0.0002)	(0.0002)	(0.0001)	(0.0001)	(0.0001)
Annual precipitation days	Linear	0.0053	0.0041	0.0021	0.0064	0.0061	0.0065
		(0.0060)	(0.0060)	(0.0061)	(0.0048)	(0.0054)	(0.0047)
	Quadratic	***−0.0002***	***−0.0002***	***−0.0003***	***−0.0002***	***−0.0002***	***−0.0002***
		(0.0001)	***(0.0001)***	***(0.0001)***	***(0.0001)***	***(0.0000)***	***(0.0001)***
Observations		3067	3067	3067	3067	3067	3067
# of indep. variables		10	17	31	48	56	48
R-squared		0.272	0.282	0.382	0.503	0.517	0.497
Control variables *R*-squared			0.094	0.226	0.433	0.471	0.423
Marginal *R*-squared			0.188	0.156	0.070	0.046	0.074

Table shows results from regressing ([log(2000 Pop Density)−log(1970 Pop Density)]×100/30) on the enumerated weather variables, control variables, and a constant. Quadratic weather variables have had their respective sample mean subtracted. Standard errors in parentheses are robust to a spatial correlation using the procedure discussed in the main text. Bold type signifies coefficients that statistically differ from zero at the 0.05 level. Italic type signifies coefficients that statistically different from zero at the 0.10 level. The Column 6 regression weights observations according to 1/(1+3000/population).

Moving to Nice Weather

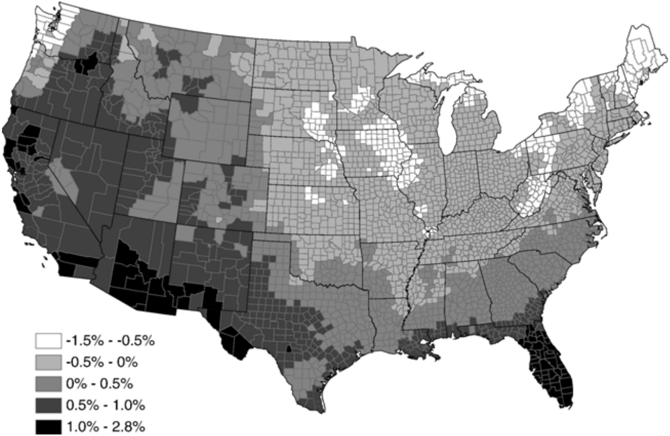


Fig. 2. Expected population growth from weather (1970 to 2000). Figure shows the fitted annual population growth rate controlling for coast, topography, initial density, concentric population, and industrial composition.