Econ 113: January 29, 2015

- Methodology: Reading Regression Results
- Westward Expansion
- Indian Removal
- Transportation
  - Roads
  - Canals
  - Railroads
  - Effect on prices

PS 1 is available on course website
Due Thursday Feb 5 at 11:10 a.m.

Interpreting Econometric Results

- Start with a specified functional form of a relationship

- Econometrics gives us an "estimated" form of the relationship

- But what is Truth?

Econometrics. . . The easy way

- Assume a "normal" distribution of possible "True" value of β around estimated value of β

The t-stat matters, lots

- Next, find or estimate the t-statistic

- If t > 2, estimate is "statistically significant"
  That is, the estimate has the correct sign :   + or -

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Where is 0? (positive β)

- If t > 2, then good bet that estimated value of β has correct ("Truth"ful) sign. "Statistically significant"

Regressions Indian Removal Westward Expansion Transportation Developments

Where is 0? (negative β)

- Here, t > 2, and estimated value of β is negative. "Statistically significant"

Regressions Indian Removal Westward Expansion Transportation Developments

β might be zero

- If t < 2, then you can't be confident in the estimate's sign. "Not statistically significant"
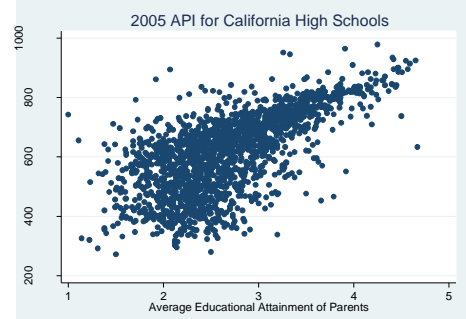
Regressions Indian Removal Westward Expansion Transportation Developments
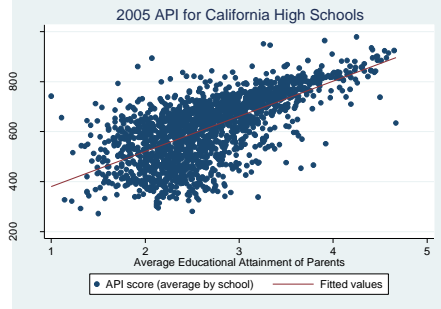
Scatter Diagram

2005 API for California High Schools

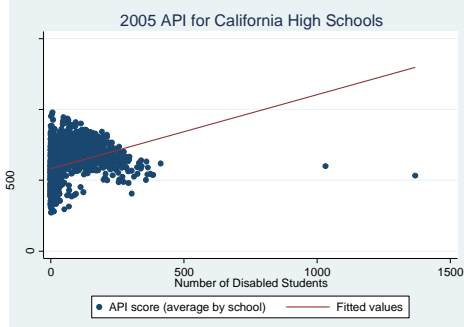Regressions Indian Removal Westward Expansion Transportation Developments

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Fitted Line (β = 140.8, t = 38)

Scatter Diagram
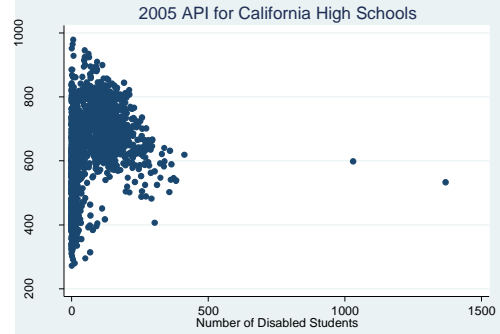
Fitted Line (β = -0.00065, t = 0.7)

Population Density, 1830

Population Trends: Westward Expansion, 1830

Westward Expansion

Table 5. Movement of Population West

	% of U.S. population living in west of Appalachians
1810	15
1830	29
1850	43
1860	49

Source: Derived from U.S. Bureau of the Census (1975), *Historical Statistics*, Series A7, A195.

Removal of Indians

- Battles and treaties and battles
  - 1780s: series of treaties
  - 1790s: battles and treaties
  - 1794: U.S. Army defeated Western Indian Confederacy
    - Confederacy = group of tribes from Northwest Territory

- 1830s: Removal of Southern Indians along the "Trail of Tears"
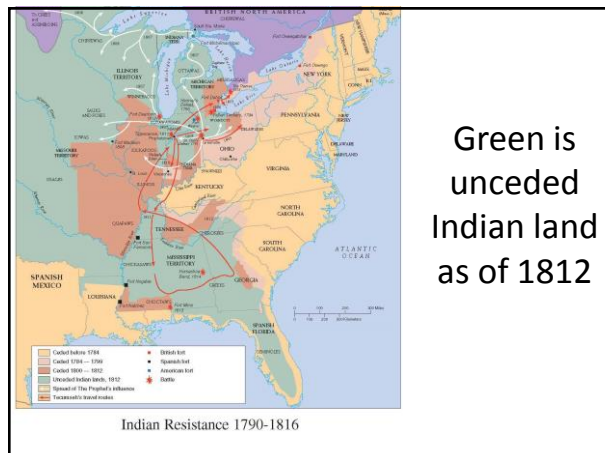
Green is unceded Indian land as of 1812

Indian Resistance 1790-1816

Cherokee Nation

- President Jackson's claim:
  - uneducated: "*Most of your people are uneducated. . .*"
  - poor: "*. . .a large portion of your people have acquired little or no property in the soil itself. . .*"
  - not agriculturally skilled or equipped: "*. . .or in any article of personal property which can be useful to them.*"
- Wishart: Does the evidence support Jackson's claim?

Uneducated?

Table 1. Cherokee Literacy Rates, 1835

	# of Cherokee households	% of all Cherokee households literate in Cherokee	literate in English
GA	1,350	53	13
NC	650	48	5
TN	424	57	40
ALA	245	57	38
Overall	2,669	53	18

Source: Wishart, David, "Evidence of Surplus Production," Tables 1 and 2.

Poor?

Table 2. Cherokee Slave Ownership, 1835

	Of all Cherokee households, % that owned African slaves	Of slave-owning Cherokee households, mean # of slaves owned
GA	7	8.0
NC	2	2.3
TN	13	8.4
ALA	16	7.5
Overall	8	7.6

Source: Wishart, David, "Evidence of Surplus Production," Tables 1 and 2.

Not agriculturally skilled?

Table 3. Percentage of Cherokee Households Achieving Self-Sufficiency in Corn Production

	% of all households	% of corn-producing households
NC	46.1	48.4
GA	46.4	52.1
AL	59.1	76.7
TN	63.9	74.0

Source: Wishart, Table 4.

Evidence of Crop Diversification

- No direct evidence, but can estimate

$$Yield\ per\ acre = \frac{Output}{Acres}$$

Crop Diversification

- Result:

$$A = 3.72^{***} + 0.0591^{***} \times Q_{corn}$$

$$\frac{1}{0.0591} = 16.92$$

Diversification Evidence

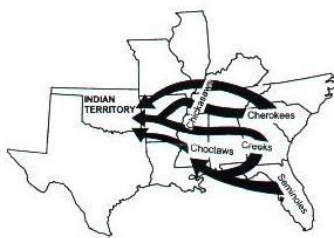**Table 4. Estimates of Yields & Acreage in Other Crops**

	Yield per acre	Acreage in other crops
TN	17.7***	6.2***
AL	15.0**	5.3***
NC	18.6***	4.2***
GA	17.9***	3.3***
Overall	16.9***	3.7***

***significant at 1 percent level.
**significant at 5 percent level
Source: Wishart, Table 7. Reported results are based on data for just corn output.

Removal: Trail of Tears
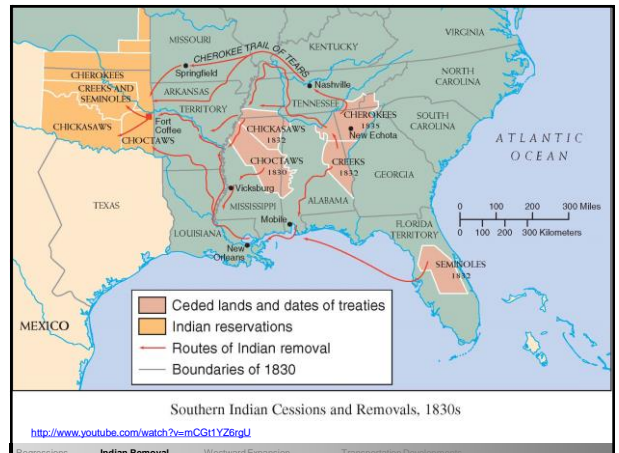
http://www.rosecity.net/tears/trail/removal.gif

Southern Indian Cessions and Removals, 1830s

http://www.youtube.com/watch?v=mCGt1YZ6rgU

Westward Expansion

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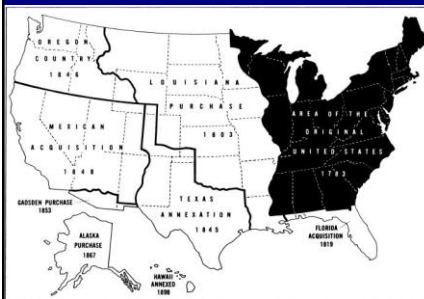*Source:* Derived from U.S. Bureau of the Census (1975), *Historical Statistics*, Series A7, A195.

- How did people get to the west?

Travelogue: Museum

Museum of the Westward Expansion, St Louis, MO, under the arch.

Land Growth

MAP 8.1 Land Growth The purchase of Louisiana marked the beginning of the continental expansion of the United States, which culminated in the purchase of Alaska in 1867 and the annexation of Hawaii in 1898.

- U.S. land mass "complete" by mid-1800s

MAP 8.3 Moving Frontier Census data from 1800 onward chronicled the constant westward flow of population. The "frontier," its profile determined by natural attractions and a few man-made and physiographic obstacles, was a magnet for the venturesome.
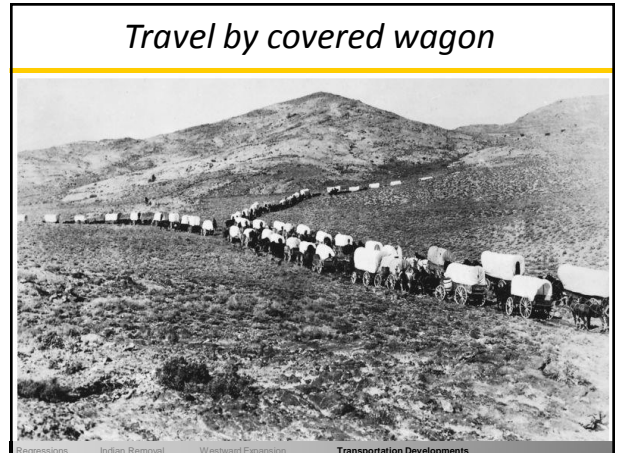
- The movement of the frontier to the west

- But it took a LONG time to get there . . .

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Travel Times, 1800 and 1857
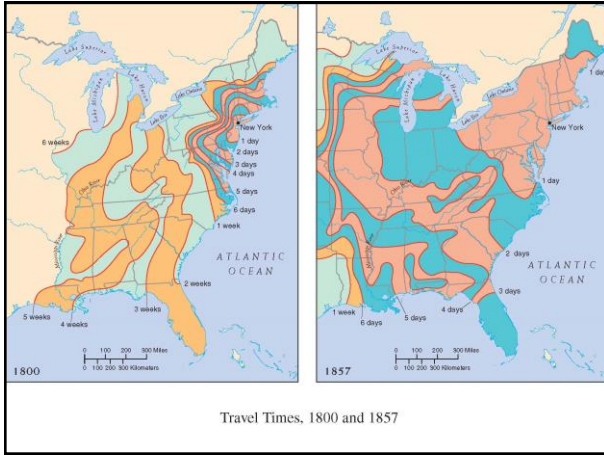
Initial Transportation Modes

- Overland Routes (roads)

- River Routes

- Ocean Routes

Regressions   Indian Removal   Westward Expansion   **Transportation Developments**

Overland Trails

Regressions   Indian Removal   Westward Expansion   **Transportation Developments**

Travel by covered wagon

Regressions   Indian Removal   Westward Expansion   **Transportation Developments**

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Transportation Developments

- *Turnpikes*
  - plank roads
  - tolls charged

Transportation Developments

- *Turnpikes*
  - plank roads
  - tolls charged

  - initially private funding . . .
  - eventually public funding

Geography Reminder: Rivers!

- Mississippi   Missouri   Ohio   Hudson
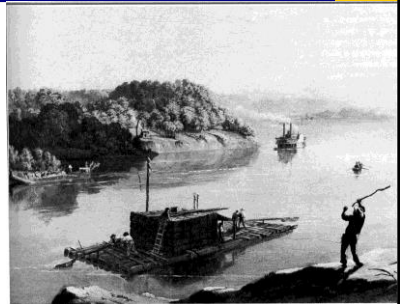
Boats

- Flatboats
- keelboats
- steamboats

next

Keelboat
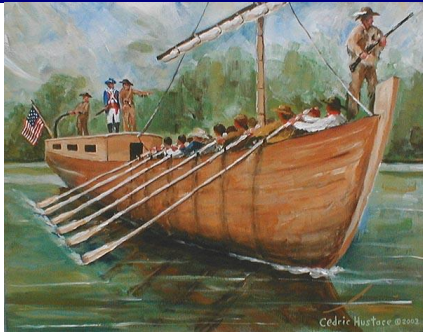
back

Steamboat
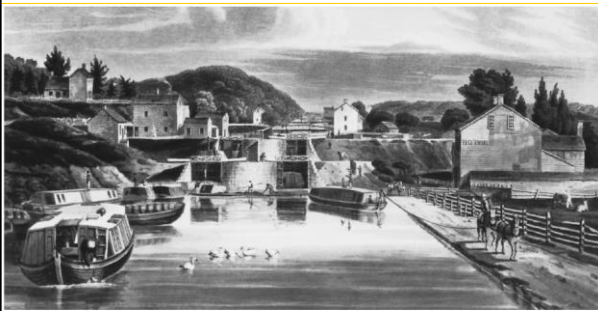
Canals

This painting shows the junction of the Champlain Canal and the Erie Canal—an important point on the trade route that was to become the preeminent link between Midwest and East Coast urban centers.
THE NEW-YORK HISTORICAL SOCIETY

How a canal works

The downstream lock gate is open.

• http://www.eriecanal.org/locks.html

Pa(w)tucket Canal (MA)

Canal Cycles

Table 6 Canal Cycles

period	$ spent (millions)	% financed with government money
1815-43	$31 m.	75 %
1844-60	$66 m.	66 %

Source: Walton & Rockoff, p. 156

FIGURE 6.3
Ten Principal Canals of the Antebellum Period, 1800–1860

Source: Carter Goodrich, *Canals and American Economic Development* (New York: Columbia University Press, 1961): 184–85.

Impact of Erie Canal

MAP 10.1 Canal Impact   Household manufacture of woolen cloth (an index of isolation from commercial routes) underwent a drastic change between 1820 and 1845 along the Erie Canal. The shaded areas indicate the one-third of the counties with the highest home production of woolen goods during this period. (*Source:* Arthur H. Cole, *American Wool Manufacture* [Cambridge, Mass.: Harvard University Press, 1926], vol. 1.)

Railroads

Table 7 Railroad Track	
	Mileage
1830	23
1840	2,800
1850	9,000
1860	31,000

Source: U.S. Bureau of the Census (1975), *Historical Statistics*, Series Q15.

- Government financing varied by region

Impact on Prices

$$\frac{\text{Price in Cincinnati}}{\text{Price in Philadelphia}}$$
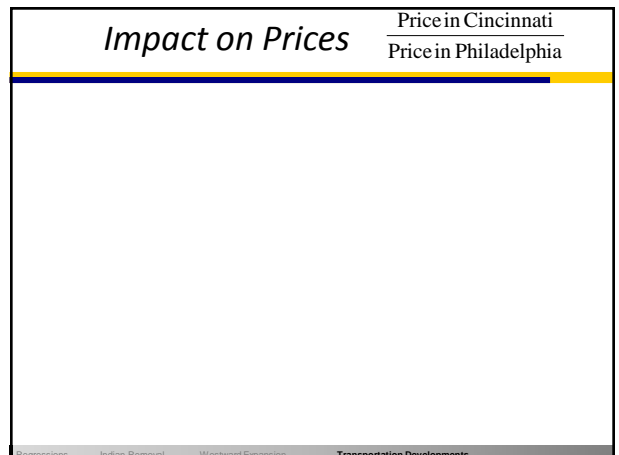
Table 8. $\dfrac{P\ in\ Cincinnati}{P\ in\ Philadelphia} \times 100$	Flour	Corn	Whiskey
1816-20	63	51	--
1821-25	52	38	68
1826-30	68	49	80
1831-35	73	55	89
1836-40	73	56	91
1841-45	77	53	80
1846-50	78	51	74
1851-55	82	61	78
1856-60	88	70	85

Source: Walton & Rockoff, Table 9-5.