

Regional Economics
Lecture 3

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Regional Economics Assignments

[Wiki Posting on Urban Design \(and Buckyballs\)](#)
[- not a graded assignment](#)

[Assignment 1: Comment on "Slumburbia" Due](#)
[5pm Feb 18](#)

[Assignment 2: Comment on "Government](#)
[Intervention in the Housing Market" Due](#)
[5pm Feb 23](#)

Outline of Lecture 3

- Alternative Measures of Labor Underutilization
- Examining the data on labor underutilization
- The geographic distribution of labor underutilization

Outline of Lecture 3

- The Location Quotient (LQ_i) Revisited
- The Hachman Index (HI)
- The Herfindahl-Hirschman (HHI)
- The Spatial Herfindahl-Hirschman Index (Spatial HHI)
- The plant Herfindahl-Hirschman Index
- The Ellison-Glaeser Index (EGI)

Outline of Lecture 3

- NAICS Codes
 - 6-digit
 - 4-digit
 - 3-digit
 - 2-digit
- Accessing County Business Patterns via American Factfinder
- Notes on .csv format
- Pondering the right measure

Alternative Measures of Labor Underutilization

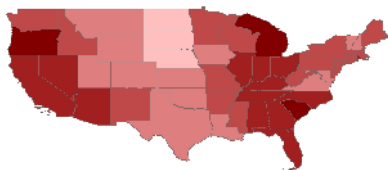
- U-1, persons unemployed 15 weeks or longer, as a percent of the civilian labor force;
- U-2, job losers and persons who completed temporary jobs, as a percent of the civilian labor force;
- **U-3**, total unemployed, as a percent of the civilian labor force (this is the definition used for the official unemployment rate);
- U-4, total unemployed plus discouraged workers, as a percent of the civilian labor force plus discouraged workers;
- U-5, total unemployed, plus discouraged workers, plus all other marginally attached workers, as a percent of the civilian labor force plus all marginally attached workers; and
- **U-6**, total unemployed, plus all marginally attached workers, plus total employed part time for economic reasons, as a percent of the civilian labor force plus all marginally attached workers.

<http://www.bls.gov/lau/stalt.htm>

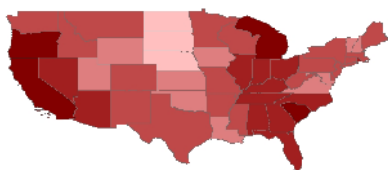
Go to Excel File

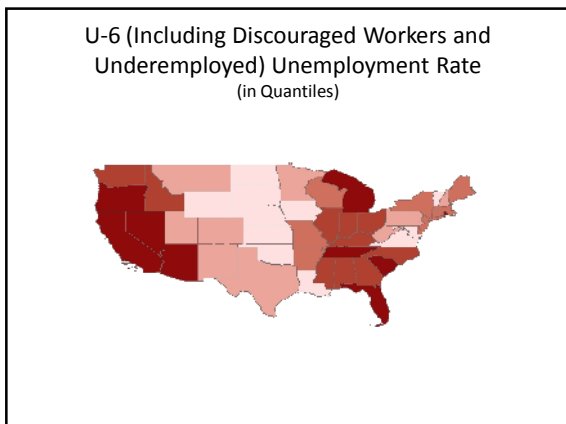
BLS_Alternative_Labor_Underutilization_Measures.xls
2009 annual averages (percent)

U-3 (“Headline”) Unemployment Rate
(in Standard Deviations from the Mean)



U-6 (Including Discouraged Workers and Underemployed) Unemployment Rate
(in Standard Deviations from the Mean)





**Location Quotient
for a particular industry (*i*)**

Concept

compare the structure of employment in a given **local area** to the structure of employment in a **reference area** – that is compare the ratio of employment in industry *i* to total employment in the local area compared to the same ratio in the reference area – usually, the base area is much larger than the local area (say, the local area is a city and the reference area is a country)

Uses

to determine the degree to which some industries are over-represented in a given local area compared to the reference area, and other industries are under-represented in a given local area compared to the reference area

**Location Quotient
for a particular industry (*i*)**

Implementation
(lower case refers to local area, upper case refers to reference area)

e_i – employment in industry *i* in the local area
 e_T – employment in all industries in the local area
 E_i – employment in industry *i* in the reference area
 E_T – employment in all industries in the reference area

$LQ_i = [(e_i/e_T)/(E_i/E_T)]$

The Location Quotient is (obviously) a relative measure.

**Location Quotient
for a particular industry (*i*)**

Spatial representation and implications

Versatility
many variables besides employment can be used to compute location quotients, including sales, value added, occupation*

Limitations/issues

*Blair and Carroll (2009, p.81)

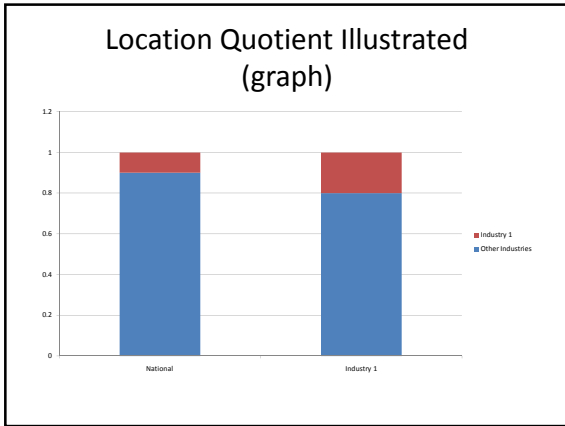
**Quarterly Census of Employment and
Wages (QCEW)**

Location Quotient Calculator

http://data.bls.gov:8080/LOCATION_QUOTIENT/servlet/lqc.ControllerServlet

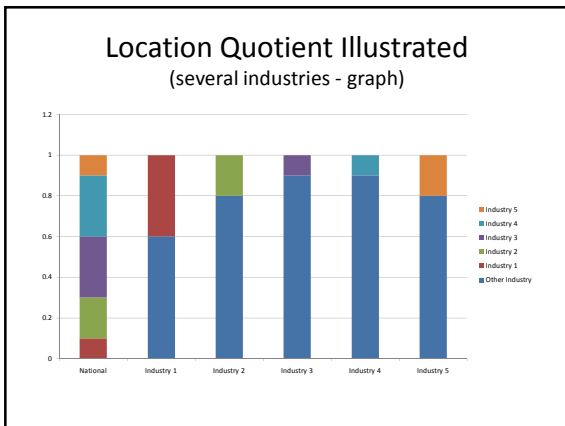
**Location Quotient Illustrated
(numerical example)**

National	Industry 1
0.9	0.8
0.1	0.2



Location Quotient Illustrated (several industries - numerical example)

Industry	National	LOCAL				
		Industry 1	Industry 2	Industry 3	Industry 4	Industry 5
Other industries	0	0.6	0.8	0.9	0.9	0.8
1	0.1	0.4	0	0	0	0
2	0.2	0	0.2	0	0	0
3	0.3	0	0	0.1	0	0
4	0.3	0	0	0	0.1	0
5	0.1	0	0	0	0	0.2



Hachman Index

Concept

gives a measure of similarity of a local area to a reference area based on *all* industries – the closer to 1 is the Hachman Index the closer is the area to the reference area across all industries; Hachman Index ranges from 0 (completely different structure from the reference area) to 1 (identical structure to the reference area);

Uses

used as a “measure of diversity” by Moody’s economy.com and in reports on economic diversity by the Federal Reserve Bank of San Francisco

Hachman Index

Implementation

1. Determine LQ_i for all $i=1,2,\dots,N$ industries
2. compute the weighted sum

$$\sum_N [LQ_i] * e_i$$
3. Compute the reciprocal ($1/x$) of the weighted sum in Step 2:

$$HI = \{1 / (\sum_N [LQ_i] * e_i)\}$$

Hachman Index

Spatial representation and implications

Perlich (1994)

<http://www.babr.utah.edu/>

Versatility

similar to LQs, many variables besides employment can be used to compute the Hachman Index

Limitations/issues

Herfindahl-Hirschman Index (HHI)

$$H = \sum_{i=1}^N s_i^2$$

where s_i is the market share of firm i in the market, and N is the number of firms. Thus, in a market with two firms that each have 50 percent market share, the Herfindahl index equals $0.50^2 + 0.50^2 = 1 / 2$.

http://en.wikipedia.org/wiki/Herfindahl_index

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Herfindahl-Hirschman Index (HHI)

The Herfindahl Index (H) ranges from $1 / N$ to one, where N is the number of firms in the market. Equivalently, the index can range up to 10,000, if percents are used as whole numbers, as in 75 instead of 0.75. The maximum in this case is $100^2 = 10,000$.

A HHI index below 0.01 (or 100) indicates a highly competitive index.

A HHI index below 0.1 (or 1,000) indicates an unconcentrated index.

A HHI index between 0.1 to 0.18 (or 1,000 to 1,800) indicates moderate concentration.

A HHI index above 0.18 (above 1,800) indicates high concentration

Legal and Regulatory Uses of HHI

See

<http://www.justice.gov/atr/public/testimony/hhi.htm>

Spatial Herfindahl-Hirschman Index

$$\sum_i (s_{ir} - x_r)^2$$

where

s_{ir} = share of industry i 's national employment in region r

x_r = share of aggregate national employment in region r

$$\sum_i ([E_{ir}/E_{in}] - [E_r/E_n])^2$$

McCann, expression (2.11), p. 81

Spatial Herfindahl-Hirschman Index

What does it say?

What data do I need to compute it?

How do I interpret it?

Example: From Location Quotient to
Hachman Index and Spatial HHI – Basic Data
(note: This data gives the same proportions as in the previous slide)

Industry	Regional	Other Industries	Industry 1	Industry 2	Industry 3	Industry 4	Industry 5
Other Industries	0.0	0.0	0.0000	0.0000	0.0000	0.0000	0.0000
1	100,000.0	200,000.0	0.0	0.0	0.0	0.0	0.0
2	200,000.0	200,000.0	0.0	1.0000	0.0	0.0	0.0
3	400,000.0	0.0000	0.0	0.0	1.0000	0.0	0.0
4	700,000.0	0.0000	0.0	0.0	0.0	1.0000	0.0
5	200,000.0	20,000.0	0.0	0.0	0.0	0.0	1.0000
TOTAL	2,000,000.0	200,000.0	200,000.0	1,000,000.0	1,000,000.0	1,000,000.0	200,000.0

LQs, Spatial HHIs, and HI

Industry	LQ	Spatial HHI	HI	Spatial HI	HI
Industry 1	0.0	0.0	0.0	0.0	0.000000
Industry 2	1.0	0.1	0.1	0.0	0.000000
Industry 3	0.5	0.0	0.0	0.0	0.000000
Industry 4	0.2	0.0	0.0	0.0	0.000000
Industry 5	2.0	0.7	0.7	0.0	0.000000
					0.000000
					0.000000

LIVE SOFTWARE DEMO

INDEXES.XLS

Hachman Index

Teaser Questions:

1. Why is the HI weighted by e_i ? What happens if the HI is unweighted (equally weighted – i.e., all $e_i = 1$?)
2. Why take the reciprocal of the weighted sum? What happens if we don't take the reciprocal?

NAICS Codes

North American Industrial Classification System (NAICS)

Go to <http://www.census.gov/eos/www/naics/>

SIC, NAICS, AND INDUSTRY CLASSIFICATION GENERALLY

Industry classification is the process of creating a typology (categorizing) firms into industries – groups of firms which produce related goods and services. The classification of firms into industries can be done on a coarse level (for example, the classification "restaurant" includes expensive bistros, burrito stands, and McDonalds) or a finer level (for example, the classification "fast-food restaurant"). In the US, two systems of industry classification are often referred to: SIC codes and NAICS codes. SIC stands for Standard Industry Classification; NAICS stands for North American Industry Classification System. Both systems can be used to classify industries coarsely (at the 2-digit level, like "restaurant") or finely (at the 6-digit level, like "fast food restaurant"). We will see examples of both coarse and fine classification.

NAICS is the current system of industry classification used by the US Department of Commerce (<http://www.census.gov/eos/www/naics/>); it replaced the SIC in 1997. Concordances are available which show the relationships among the code numbers (<http://www.census.gov/eos/www/naics/concordances/concordances.html>).

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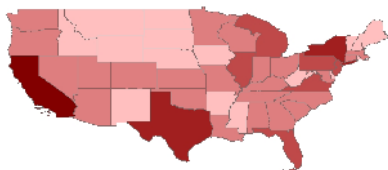
Issues

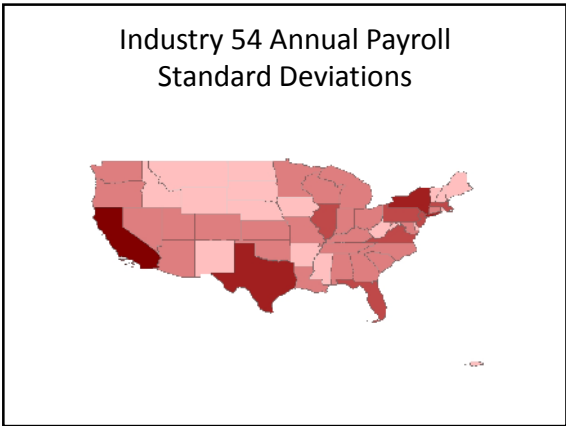
- Level of industry aggregation
- Level of geographic aggregation
 - of local area
 - of reference area

Some Preliminary Maps (related to industry 54)

FOLLOWING SLIDES

Industry 54 Employees Standard Deviations





WHAT'S WRONG WITH THESE MAPS?
Another teaser question

Miscellaneous Information

FOLLOWING SLIDES

County Weekly Wages in California

(latest report from BLS regional office)

Information and data:
<http://www.bls.gov/ro9/qcewca.htm>

Graphic:
<http://www.bls.gov/ro9/qcewca.jpg>

Average Weekly Wages
(National average: \$316)

Wage Range	Color
\$193.2 - \$248	Lightest Yellow
\$249 - \$299	Yellow
\$300 - \$349	Orange
\$350 - \$399	Dark Orange
\$400 - \$449	Dark Red

Local Area Unemployment Statistics (BLS)

<http://www.bls.gov/Lau/>
