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USING SPATIAL COST OF LIVING DIFFERENCES AS A TEACHING TOOL*

James A. Kurre

Introduction

Each spring I teach "ECNS 430: Regional Economics" to a class of approximately 40 juniors and seniors. I suspect that when they register for my class, most of the students don't have a clue as to what regional economics is. Most sign up because their major requires at least one upper level economics course or because they want an Econ minor or because the class's time slot lets them sleep in. (I'm not an early riser myself, so I can't fault them for that last one.)

I consider it to be part of my job to let them know early on just what the course is all about and why the field is important. My goal is to convert them from a group of accidental participants into a group who are convinced that this is the most important and interesting material they could learn in their four years of college (or five or six), and they're immensely lucky to have stumbled onto it. If I can convert apathy into enthusiasm and passive participation into active interest, I'm convinced we'll all have a better experience during our semester together: they'll learn more, I'll get better teaching evaluations, and we'll all be stimulated intellectually in the process.

At least that's the theory.

In practice, the course contains a lot of material that is potentially a good substitute for *Sominex*. While I know that the topics are useful, students sometimes can find the intricacies and technical detail to be stultifying, especially on a spring afternoon. It's my job to show them that input-output multipliers can be exciting; that knowing about inter-regional convergence can help them become rich; and that regional policy debates are at least as thrilling as *Jurassic Park*.

Okay, so it's an uphill battle. But I find that the biggest part of the battle is won or lost in the first week or two. If I can excite them early on and show them how the material is relevant to their lives, their default mode about the class becomes "Of course the stuff in ECNS 430 is useful!" rather than "This is more of that abstract, theoretical, useless Econ stuff, and I challenge you to convince me that any of it is worthwhile."

How do I do this? On the first day, I have to set the hook. I typically have spent much of the first class laying out the ground rules for the

* A version of this paper was presented at the 81st annual meeting of the American Agricultural Economics Association in Orlando, Florida in a session entitled "Teaching Rural and Community Development Economics to Undergraduates," which was organized by David W. Hughes of Louisiana State University.

class—all the mundane details such as the number of exams, what's expected for the class project, the fact that I'm a tough grader and a hard-liner on academic dishonesty, etc. I'm becoming more convinced that this is *not* the best way to approach it, however. While all of this material is important in establishing a contract between the professor and the class, it all can be spelled out thoroughly in a detailed syllabus. (Perhaps calling it something like a "User-Friendly Guide to the Secrets of ECNS 430" would get them to read it more carefully.)

I'm becoming convinced that the first class meeting should be a time to excite them about the course; to get them to commit to the course and build an expectation that it will be one of their best classes. This isn't done by a dull recitation of class requirements or by launching into the differences between homogeneous and nodal regional classification schemes, however. What's needed is something intriguing and provocative, something to pique their interest and arouse their curiosity.

I start by asking how many of them plan to stay in the local area (Erie, Pennsylvania) after graduation. I ask those who plan to stay what they think about local job prospects. I ask those who plan to leave if they know where they're going and why. Many, especially the juniors, have not given much thought to the issue yet. At this point I show recent unemployment rates for Erie, the state, and the nation, followed by a map of state unemployment rates.¹ It is clear that some areas are doing much better than others, and I encourage them to ask the key question: WHY?

I follow this with income patterns, showing income per capita in the counties of Pennsylvania ranked from highest to lowest.² Persons living

¹ These data can be found in a newsletter published monthly by the U.S. Bureau of Labor Statistics entitled *State and Metropolitan Area Employment and Unemployment*. The issue covering the April 1993 data is USDL 93-209, issued June 16. Call 202/606-6392 for information or a free subscription. This newsletter also includes a map with state unemployment rates for the most recent month.

² Personal income data can be found in *Local Area Personal Income, 1984-89*, compiled by the U.S. Bureau of Economic Analysis. Volume 1 of this five volume set gives data for the U.S., states, and all metro areas. The other four volumes give data for all counties of the country. All of these data are also available on CD-ROM from the BEA in the form of the *Regional Economic Information System Compact Disc, 1969-92*. This CD costs only \$35, yet gives annual data from 1969-92 for all states, MSAs, and counties of the country as well as national data, broken down by type and industry source. Call 202/606-5360 for information or to order. Recent personal income data (1989 to 1991 only) for all states, MSAs, and counties also can be found in Wallace K. Bailey, "Comprehensive Revision of Local Area Personal Income Estimates, 1969-90," *Survey of Current Business*, 73, no. 5 (May 1993), pp. 63-87.

in the richest county have more than twice the income of those in the poorest county. A map of the state shows some clear patterns, with the southeastern counties surrounding Philadelphia tending to be the richest areas, while rural counties tend to be the poorest. Again: WHY?

Taking it one step further, I show income patterns by region and by state. We notice that the poorest counties of Pennsylvania have incomes similar to those in the poorest states (West Virginia and Mississippi,) while the richest Pennsylvania counties are comparable to the richest states (Connecticut, New Jersey, and D.C.). In other words, some counties of Pennsylvania are more similar to Mississippi than they are to the relatively nearby suburbs of Philadelphia. Again: WHY?

Students typically are surprised to find that such great differences occur in income and unemployment rates, even within a single state. They start to realize that maybe they should spend some time considering alternative locations; that returning to their hometown may not be in their best interests, after all—at least financially. If I can succeed in stimulating them to start thinking about the possibility of locating somewhere else, I feel like I've done my bit toward expanding their horizons and perhaps even toward improving the spatial distribution of labor and increasing efficiency in the economy a little.

This is not enough to justify three college credits, however. But it typically does succeed in getting students' attention, even the perpetual denizens of the back row. At this point I introduce them to the idea that this course will deal with patterns in the data: identifying and describing them, explaining them (using economic theory), and finally trying to influence them with policy.³

Cost of Living Differences

Basics

But what about spatial cost of living (COL) differentials? Of course, the cost of living issue typically arises during the discussion of why incomes differ over space. If it doesn't, showing income data for New York City, Boston, and San Francisco relative to the local area surely will bring the issue into the discussion.

³ The importance of the distinction between description and explanation is highlighted by Frank Giarratani in a paper he presented at a session devoted to the teaching of undergraduate regional economics at the 38th North American meetings of the Regional Science Association International in New Orleans in November 1991. An abbreviated version of his paper was published as part of "Teaching Undergraduate Regional Economics," pp. 133-136 in the Fall 1992 issue of *The Review of Regional Studies*. The first part of that issue presents condensed versions of the papers presented by six of the participants in the session.

Appendix A includes the outline I use for this topic in my class. I teach from this outline and also distribute it to the class. My objectives for the topic are:

- To present, early in the course, a topic that students typically find interesting;
- To show material that they can actually use;
- To introduce sources of spatial actual of living data;
- To teach students to be skeptical of published data;
- To review (and use) the concept of nominal and real values; and
- To show how regression analysis is useful.

While this paper does not discuss all of the topics on the outline in detail, it will explore some of the most important issues.⁴

All of my students have taken an introductory macroeconomics course, so they have seen price indexes before. Remembering what I was like as an undergraduate, I do not assume that they necessarily remember all the salient details, however, so I assign a reading which lays out the basics.⁵ In the past I have presented examples of the calculation of a temporal price index in class, but these take a lot of precious class time. In the future I plan to lean more on an assigned reading and homework problem or quiz to get students to review this material on their own and leave more class time for the spatial aspects that are germane to this class.

One potentially fatal misunderstanding that can arise here is the difference between a temporal price index, such as the Consumer Price Index, and a spatial price index. While the former compares the price of a market basket for one area through time, the latter compares the price of the basket across areas at one point in time. The temporal index answers the question "How much have prices changed over time in this area?" while the spatial index answers "How much more does it cost to live in area A than in area B at this point in time?" Published data can be identified quickly as to type by examining the base used by the index; a temporal index such as the CPI uses a time period as the base ("1982-84 = 100"), while a spatial index uses a geographical area ("100 = urban

⁴ Many of these goals also can be accomplished through the use of so-called quality of life (QOL) data. In this regard, I have used the ratings of metropolitan areas from Boyer and Savageau's *Places Rated Almanac* successfully. A paper outlining my use of QOL in this class, entitled "Using Quality of Life Ratings to Teach Skepticism and Hypothesis Testing in a Regional Context," is available on request from the author.

⁵ I have used "How the Consumer Price Index is Determined" in Fred C. Armstrong, *The Business of Economics* (St. Paul: West Publishing Co., 1986). An appropriate section from an introductory macro textbook also would fill the bill.

average"). It is important to warn students that the Bureau of Labor Statistics publishes temporal CPI indexes for several metro areas. These are not spatial indexes that can be used to compare cost of living across areas at one point in time. They simply tell how much prices have risen in each area compared to some base period. Without information about relative costs across areas in that base period, no conclusions can be drawn about relative costs across space.

Spatial Price Index Data

The most-available source of spatial cost of living data is the *ACCRA Cost of Living Index*, (hereafter COLI) published quarterly by the American Chamber of Commerce Researchers Association.⁶ The COLI includes price data for roughly 300 urban areas each quarter. If local libraries do not subscribe to the COLI, you may be able to find it at your local chamber of commerce. If your local chamber participates in the COLI, they also will have a copy of the *Cost of Living Index Manual*, which gives complete details on procedures used to gather the raw price data, including specification of all items in the basket.

The ACCRA data are collected by volunteers (frequently, but not always, chambers of commerce) in the participating areas during the first week of each quarter. ACCRA has identified a market basket of approximately 60 items that represent most of the purchases of a mid-management household. These items and their weights are chosen based on results of the periodic Consumer Expenditure Surveys which the Bureau of Labor Statistics uses in formulating the Consumer Price Index. By careful selection, a relatively small group of items is used to represent the broader range of goods and services that a family typically purchases. These items are grouped into six categories: groceries, housing, utilities, transportation, health care, and miscellaneous goods and services.

Each participating area sends its data to the ACCRA headquarters where they are double-checked and then integrated into an index that compares the cost of the market basket in each area with the average of all areas participating in that quarter's survey.

Table 1 presents the actual ACCRA index data from the third quarter of 1989 for a sample of areas. An index value of 100.0 represents the average cost for all 289 areas that participated in that quarter, so Erie's value of 105.0 for the total budget indicates that the overall cost

⁶ The Bureau of Labor Statistics used to publish a spatial price index called "Family Budgets." This series presented data for selected MSAs for several types of households with different income levels. Unfortunately, this program was suspended in the early 1980s. For information, see Chapter 12, "Family Budgets," in the 1976 edition of the Bureau of Labor Statistics's *Handbook of Methods*.

of living there was 5.0 percent higher than the average of the other areas in the survey. Pryor Oklahoma's index of 84.6, on the other hand, represents a cost 15.4 percent below the average for these 289 areas.

The ACCRA index has some limitations, however. ACCRA does not attempt to include the government sector in its cost of living calculations because it has found no acceptable way of integrating the myriad forms of taxes imposed by multiple levels of government in different jurisdictions, as well as somehow evaluating the service levels provided. While the ACCRA basket has been designed to cover all of the major categories of consumer expenditures, it does not adequately represent some of the subcategories such as vehicle or furniture purchases, shelter repairs, and educational expenses.

Because participation in the index is voluntary, the rather large group of areas that typically participates cannot be assumed to be a random sample of American communities. It comes as no surprise that some of the most expensive areas such as Boston, Manhattan, and San Francisco have not participated on a regular basis. Of course, this has the effect of making other areas seem more expensive (in relative terms) than they would if these high cost areas were represented. On the other hand, the smallest and most rural areas are often unable to participate, and this may have the opposite effect.

Because the sample of participants changes from quarter to quarter, the COLI index numbers cannot be compared through time. Items in the market basket frequently are changed slightly from quarter to quarter, which also means that index numbers cannot be compared through time.

One major concern about the COLI that bears mentioning in class is the fact that local volunteers collect the primary data. This function most often is carried out by local chambers of commerce, but local government agencies or even college research groups may do the actual pricing. Students frequently will take any published information as gospel, so it is useful to plant the seed of a little healthy skepticism at this point. I usually ask why a local chamber would agree to undertake collection of data, despite their limited resources. TANSTAAFL (There Ain't No Such Thing As A Free Lunch) certainly applies to chambers of commerce, and staff time spent on gathering prices around the area must be taken from other tasks.

After a brief discussion of altruism, someone typically mentions that a key chamber goal is to promote local economic development. This leads to consideration of what the chamber should do if the COLI numbers are not good news. It is typically the case that the local chamber would prefer to see lower cost of living numbers, as this would make the area more attractive to potential relocators. A discussion of situational ethics may ensue if you permit it, but my class schedule is too tight to

allow a lot of time for the philosophical issues involved. Instead, I point out the fact that it would be possible for the data to be massaged by an unscrupulous data gatherer and that we may have no clear way of knowing whether we can trust the data.

At this point, some students go to the other extreme and conclude that all data are garbage, especially the COLI numbers. The cynics and the lazy students will see this as a reason for not bothering with data analysis at all, preferring to make decisions based on their gut instincts, anecdotal information, gossip masquerading as insider information, chicken entrails, etc. This paves the way for a discussion of methods to verify the accuracy of data—any data—such as examining the techniques involved in data collection, comparing with other data sources, and considering the motivation of those collecting the data. Finally, we recognize that some decisions in the real world must be made even though we don't have complete information.

COLI Patterns and Explanations

After familiarizing students with the COLI data, I ask where they would expect the cost of living to be higher or lower. What factors should cause costs to be higher, and why? They respond with various hypotheses, and I require that they give some reason for their expectation, reminding them that this is an *economics* course. They take the hint, and we work into a discussion of simple supply and demand forces determining prices. We typically encounter opposing hypotheses such as “a greater population means greater demand and higher prices,” and “larger places can support production at larger scale and so enjoy economies of scale and lower prices.” (This also sets the stage for later discussions of agglomeration economies.)

At this point, it is possible to lead into a discussion of the use of statistics to test hypotheses, and regression analysis in particular. We explore the idea of graphing COL against population or density, to look for patterns.⁷

It is an easy matter to lead from the scatter diagram (Figure 1) to the resulting regression equation:

$$\text{COL} = 93.293 + 0.0226 \text{ Density}^*$$

$$R^2 = .458 \quad n = 248 \quad \text{*Statistically significant at the 5 percent level}$$

This provides an understandable context for explaining the values of the parameters, the coefficient of determination, etc. This case also

⁷ Population and density data can be found in the Census Bureau's *State and Metropolitan Area Data Book 1991*.

can lead to a discussion of nonlinear patterns, as well, as some variables do not have a simple linear effect on COL.

The R^2 also makes it clear that a single variable is not enough to explain COL adequately. Students typically will be able to think of several other variables that could have an impact on an area's COL. My own research in this area suggests that density (population per square mile), aggregate income, local growth rates, electric rates, and government costs (expressed as revenue dollars per full-time equivalent employee) are significant determinants.⁸ In class I present the regression equation that resulted from my work and interpret the results:

$$\begin{aligned} \text{COL} = & 83.939^* + 0.00362 \text{ DEN}^* - 1.647(e-7) \text{ DENSQ}^* + \\ & 7.427(e-8) \text{ AGGINC}^* + 0.109 \text{ AGGGTH}^* + 1.784 \text{ ELEC}^* + \\ & 0.175 \text{ GCST}^* + 11.025 \text{ NE}^* - 5.019 \text{ MA}^* - 9.104 \text{ SA}^* - \\ & 10.262 \text{ ESC}^* - 9.743 \text{ WSC}^* - 9.034 \text{ ENC}^* - 11.430 \text{ WNC}^* - \\ & 7.967 \text{ MTN}^* \end{aligned}$$

adj $R^2 = .636$ $n = 248$ *Statistically significant at the 5 percent level

where:

- COL = ACCRA total cost of living index, 1989;
- DEN = Density, 1989;
- AGGINC = Aggregate income, 1989;
- AGGGTH = Growth rate of AGGINC, 1984-1989;
- ELEC = Residential electricity rate per kwh, 1989;
- GCST = Government cost measure, 1986-1987FY;
- SQ suffix = Variable squared;
- NE = New England region;
- MA = Middle Atlantic region;
- SA = South Atlantic region;
- ESC = East South Central region;
- WSC = West South Central region;
- ENC = East North Central region;
- WNC = West North Central region; and
- MTN = Mountain region.

⁸ My work involved estimating costs of living for all counties of Pennsylvania, using an econometric model that was calibrated using ACCRA data. The final report is entitled *The Cost of Living in Rural Pennsylvania* and is available free from the sponsor, the Center for Rural Pennsylvania, at 717/787-9555. See Kurre (1992a).

(Pacific region is omitted; used as base.)

If time allows, I extend this discussion a little further by using the regression equation to estimate COL values for areas that were not in the sample. The goal of my research (mentioned in the previous footnote) is to estimate COL index values for all of the counties of Pennsylvania, and I show the results of this work. I also take the opportunity to talk a little about estimating out of sample; the areas used to calibrate the regression model are mostly urban areas, but many of the Pennsylvania counties are rural. (In other words, they should bring a little skepticism to the research work of their professors, too.)

COL Subindexes

As mentioned above, the COL index has six subindexes: groceries, housing, utilities, transportation, health care, and miscellaneous goods and services. I present basic descriptive statistics about these subindexes, as shown in Table 2 and Figure 2. It is immediately obvious that there are different patterns for the subindexes. I focus on the ranges and standard deviations, which vary dramatically across the subindexes.⁹

For this particular set of data, we notice that the groceries subindex has the smallest range and smallest standard deviation, while housing has the highest. The difference between these two subindexes is considerable; while the groceries subindex varies from a low of 85.3 to a high of 120.5, housing ranges from a minimum of 66.8 to a maximum of 259.6. Housing's standard deviation is over five times as large as that of the groceries subindex. Again, the key question is WHY?

This is a good place to raise the important effect of space on prices and economic behavior, a topic that typically is ignored in introductory economics classes. Recognizing the fact that it is much easier to move a can of artichoke hearts than a three bedroom ranch with a wood-burning fireplace, we move naturally into a discussion of arbitrage and the differing mobility of different types of goods and services. We also discuss differences in elasticity of supply among goods and services due to factors other than space. For example, the time between the decision to begin building a house and when it is ready for occupancy is much greater than the time between the decision to produce a Big Mac and the time it's ready for consumption. As a result, the short-run supply of

⁹ These data are for the same areas included in my COL study mentioned earlier (Kurre, 1992a). The sample includes 248 areas of the 289 that participated in that quarter's survey. The other 41 were dropped from the sample due to data problems. This explains why the means for the indexes are not all equal to 100.0, as they otherwise would be.

housing is much more inelastic than the supply of Big Macs. This results in a bigger price effect from a sudden (or even ongoing) shift of the demand curve for housing. A longer time for adjustment to equilibrium means a larger variation in housing prices from place to place.

The discussion also comes back to the fact that the subindexes may have different determinants. For example, the discussion above suggests that local growth rates may play a more important role in determining housing prices than grocery prices. Likewise, the efficiency of local government may be important in determining local transportation costs, but meaningless for groceries. I typically present the actual regression results from my research project here to demonstrate that this is so.

Real vs. Nominal

The final topic in this part of the class involves comparison of real with nominal incomes across space. Given the nominal personal income data and the ACCRA price index, we review the technique for deflating nominal incomes and look at spatial patterns of real incomes compared with nominal. The general conclusion is that areas with higher incomes also tend to have higher prices, so that real income differentials are substantially less than nominal income differentials. The COL differences do not offset all of the nominal income differentials, however; areas with higher nominal incomes also tend to have higher real incomes.

I give my students two assignments to help them learn the material. One (see the attached "Practice Problem for Price Indexes") gives them raw price data for three areas and asks them to construct a spatial index. In order to show students the personal usefulness of this topic, I ask them to decide between hypothetical job offers in two different areas. Everything else equal, would they be better with a \$19,500 job in Cleveland or a \$15,000 job in Erie? This makes the topic immediately relevant to them, to help them see its importance and usefulness.

The other assignment my students receive is part of a broader project in which each student is assigned his or her own MSA, to which he or she applies the tools and techniques we discuss in class.¹⁰ For this part of the project they are required to get data from the ACCRA COLI for their metro area, both for the overall index and for the subindexes, graph and describe the data, and compare the real value of a \$25,000 salary in Erie and their MSA. My goal is to have students see the data

¹⁰ The complete project is described in "Teaching Undergraduate Regional Economics," pp. 137-147 in the Fall 1992 issue of *The Review of Regional Studies*. A copy of the original conference paper, which is a more complete version of the *Review of Regional Studies* piece, is also available directly from the author.

source (the COLI) and to use the data in a real world application so they'll be ready to do so when they need to later in life.

Conclusion

I have received favorable reactions from my students on the cost of living portion of my course. They seem to be interested and, more importantly, they become actively involved in the class discussion.

On a more formal level, over the last few years I have surveyed my students regarding the usefulness of the various portions of my course project. These portions include topics such as quality of life, location quotients, measures of specialization, export base analysis, shift-share analysis, and input-output multipliers. My students consistently have placed the COL assignment at or near the top of the list.

Finally, I occasionally have received visits from students a year or more after they have completed the course, asking to see the latest ACCRA COLI data to help them evaluate job offers. I also notice students stopping to look at the COL numbers I post on the bulletin board outside my door.

Students participate in the COL class discussion, they tell me they think COL is a useful topic, and, most importantly, they actually use it. What more could I ask?

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USDL 93-209 (Washington D.C.: Bureau of Labor Statistics, monthly).
(This newsletter has been split into two parts as of summer 1993:
"Unemployment in States" and "State Employment and Metropolitan
Area Unemployment." Call 202/606-6392 for information or free sub-
scription.)

Table 1—Sample Data From ACCRA Cost of Living Index, Third Quarter, 1989

	Total	Groceries	Housing	Utilities	Transportation	Health Care	Misc.
Buffalo NY	107.2	107.1	107.0	119.3	107.6	103.0	103.8
Cleveland OH	109.5	98.9	111.0	128.3	106.7	104.2	110.0
Dothan AL	91.4	97.0	83.6	95.1	98.2	79.5	93.3
Erie PA	105.0	102.5	111.3	105.0	106.9	98.8	102.4
Kodiak AK	146.6	150.3	164.3	187.7	107.7	172.3	127.3
Lincoln NE	93.2	90.8	87.9	96.6	102.3	85.1	95.0
Miami FL	110.1	101.7	113.3	132.2	99.6	127.7	104.8
Nassau-Suffolk NY	157.2	120.5	243.7	188.3	124.9	140.6	121.1
Philadelphia PA	127.2	108.4	142.4	171.3	109.6	139.9	115.3
Pittsburgh PA	102.5	99.3	105.0	112.1	103.2	106.1	98.0
Pryor OK	84.6	91.4	74.7	69.1	88.2	94.1	90.0
San Francisco CA	144.5	108.2	259.6	81.1	124.7	155.3	109.8
Washington DC	128.4	107.7	179.0	117.0	115.0	125.7	113.5

Source: ACCRA Cost of Living Index, 22, no. 3 (Third quarter 1989)

Table 2—Descriptive Statistics for COL Indexes, 3rd Quarter, 1989

	Total	Groceries	Housing	Utilities	Transportation	Health Care	Misc.
Mean	99.1	99.3	98.4	99.9	99.3	97.9	99.2
Minimum	84.6	85.3	66.8	33.7	82.4	71.5	85.2
Maximum	157.2	120.5	259.6	188.3	127.0	164.4	121.1
Range	72.6	35.2	192.8	154.6	44.6	92.9	35.9
Standard Deviation	9.5	5.2	27.9	16.7	8.0	14.6	5.6

Source: ACCRA *Cost of Living Index*, 22, no. 3 (Third quarter 1989)

Figure 1—Scatter Diagram of Cost of Living and Density

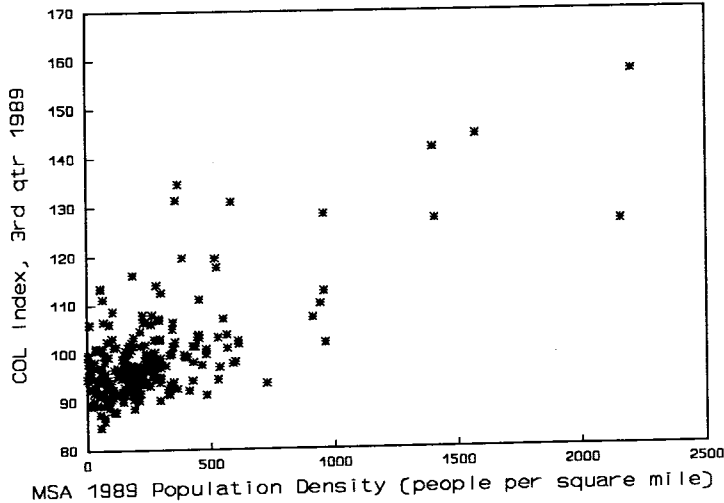


Figure 2—Standard Deviations for COL Indexes, 3rd Quarter 1989

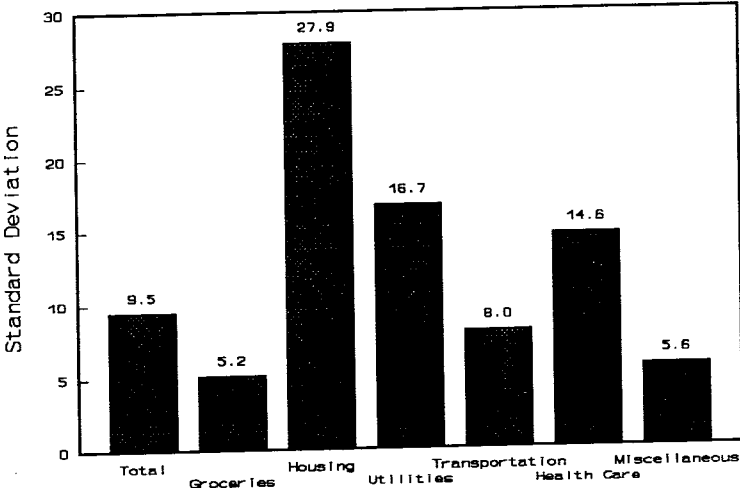


Figure 3—Cost of Living Assignment: Practice Problem for Price Indexes

Item	Quantity	Prices		U.S. Urban Average
		Erie	Cleveland	
A	50	\$.40	\$.50	\$.50
B	100	.30	.40	.30
C	60	.50	.65	.60
D	3	15.00	20.00	18.00
E	10	5.00	5.50	4.50

The table above shows the market basket of the (only) five goods that the average family buys during a month. The family consumes 50 units of good A, 100 units of good B, and so on. The table also gives prices of these goods in Erie and Cleveland, as well as the average prices for all U.S. urban areas.

- 1) Construct a price index showing the index values for Erie, Cleveland, and the U.S. urban average. Use the U.S. urban average as the base for the index. [*Erie: 92.1 Cleveland: 115.3 U.S. Average: 100.0*]
- 2) Is this a spatial or a temporal price index? How can you tell? (Hint: What is the base for this index?) [*Spatial; the base is an area, not a year.*]
- 3) In percentage terms, how much more/less does it cost to live in Cleveland than in the average urban area? ... in Cleveland than in Erie? (Hint: the answer is not 23 percent, although that is close.) [*Cleveland versus US: 15.3 percent; Cleveland versus Erie: 25.2 percent*]
- 4) If you got a job offer in Cleveland that pays \$19,500 per year and one in Erie that pays \$15,000 per year, which would yield the higher level of real income? [*Cleveland: \$16,912; Erie: \$16,287*]
- 5) Why might this price index not give an accurate measure of your real income in these two locations? [*Discuss problems of PI's generally, ACCRA data, etc.*]
- 6) What other factors should you take into account in making your location decision? [*I use this as a lead-in to the topic of quality of life*]

Figure 4—COL Project Assignment

A) COST OF LIVING

Consult the American Chamber of Commerce Researchers Association Cost of Living Index for the third quarter of 1992. Look over the explanatory material in the first couple of pages, as well as the items in the ACCRA basket.

- 1) If your metro area participated in the index for the third quarter of 1992, put the information requested below into your project portfolio. If your MSA did not participate, you have a couple of options:
 - a) Check previous editions to see if your area has participated in the past. The library doesn't subscribe, but I do. You can check them in my office.
 - b) Pick the MSA that is closest to yours and present the following information for it. Be sure to indicate the metro area that you use and explain why/how it is similar to yours; specifically, why is it a good proxy for costs in your MSA? "Close" may mean "geographically close" or it may mean "a similar MSA." In any case, you must justify your choice of MSA and show that the MSA you're using is a reasonable substitute for your actual MSA. You must justify the option that you choose (i.e., don't just pick the easiest one.)
- 2) Report the overall index for the metro area, as well as each of the six major categories, in a table.
- 3) Present a graph that quickly will give the reader an understanding of these data. (Give a little thought to the type of graph that would be most useful here and what would help you understand the differences among the categories.)
- 4) Briefly summarize the patterns in a paragraph or two. (Your description should interpret the numbers as if you're explaining them to an intelligent layman, and your discussion should refer to the graph.) Which categories had the highest index? ... the lowest? Do your findings fit with the costs of living rankings given in the *Places Rated Almanac* (in the next part of this project)?
- 5) Finally, how much would a salary of \$25,000 be worth, in deflated/real/average U.S. dollars, in your MSA? Show your work and briefly explain what the answer means.

Don't forget to cite your data source(s) on this and all parts of the project.

[Part B requires similar work with quality of life data from the *Places Rated Almanac*.]

APPENDIX—OUTLINE OF COST OF LIVING COMPARISONS ACROSS REGIONS

- I. Price indexes versus cost of living indexes
 - A) Constant basket versus constant standard of living (single indifference curve)
- II. Price indexes (or indices)
 - A) Temporal
 - B) Spatial
- III. Technique
 - A) Determine the market basket to price
 - B) Gather price data for different times (temporal) or places (spatial)
 - C) Calculate total cost of the basket
 - D) Convert to an index
- IV. Temporal price index: the Consumer Price Index
 - A) Consumer Expenditure Surveys
 - B) CPI-U versus CPI-W
 - C) Calculation and interpretation
 - D) Base year(s)
 - E) Deflating nominal amounts: $\text{real} = (\text{nominal}/\text{price index}) \times 100$
 - F) CPIs for selected MSAs and regions
 - MSA and region CPIs are temporal, not spatial, indexes!
 - G) Data sources: *Monthly Labor Review*, among others
- V. Spatial price indexes
 - A) Technique
 - B) Calculation and interpretation
 - C) Base area (not year)
 - D) Example of application
- VI. Spatial cost of living data
 - A) Private companies (e.g., Runzheimer)
 - B) American Chamber of Commerce Researchers Association Cost of Living Index (ACCRA COLI)
- VII. Problems with spatial price indexes
 - A) Which quantities to include in the basket? e.g., fuel, winter clothes, preferences (beef versus pork)
 - B) Government goods and services, and taxes
 - C) Housing
 - D) Quality differences generally
- VIII. Reasons why ACCRA COLI might not measure your cost of living accurately
 - A) Potential inaccuracy in the primary data
 - Volunteers gather the data
 - Incentives in data collection

APPENDIX (cont.)—COST OF LIVING COMPARISONS ACROSS REGIONS

- Bias in the sample of areas that participate
 - B) The items in the basket may not reflect the categories effectively
 - e.g., transportation doesn't include vehicles
 - The basket also omits furniture, shelter repair, educational expenses and the government sector
 - C) The basket may not reflect your expenditure patterns.
 - D) BUT ... it is often necessary to use limited information to make decisions
- IX. Patterns in cost of living differentials
- A) Use of regression analysis to identify important factors.
 - B) Resulting equation:
$$\text{COL} = f(\text{Density}(+), \text{Aggregate income}(+), \text{Growth}(+), \text{Electric rates}(+), \text{Government costs}(+), \text{Regions})$$
 - C) Estimates (using this equation) for Pennsylvania counties
 - D) Patterns
- X. Variation in subindexes
- A) COLI has six subindexes: groceries, housing, utilities, transportation, health care, and miscellaneous.
 - B) Ranges and standard deviations
 - C) Arbitrage and mobility of the goods
 - D) Elasticity of supply
 - E) Different determinants for subindexes
- XI. Real income differentials versus nominal income differentials