Week 2: Introduction to Urban Economics and Firm Location

Section Objectives

1. Introduce the main concepts for characterizing and thinking about urban and regional economic and social change.
2. Develop the ability to engage in urban/regional economic research at several levels.
3. Introduce the range of information sources and methods for conducting effective, focused analysis of economic change.
4. Impart understanding of the value and need for respectable and responsible economic analysis as part of the community planning process.

The Urban Economy: An Introduction

Heilbrun allows that urban economics is “a field of study in which we use the analytic tools of economics to explain the spatial and economic organization of cities and metropolitan areas (and regions) and to deal with their special economic problems.” In and of itself, urban implies an economic dimension.

In the first instance we must define what we mean by urban. Perhaps the easiest distinction is to characterize nonfarm (non-peasant) as urban. There is also a time element at work. In times past a very large part of the productive labor in the United States was devoted to producing food, which was done directly on the farm. Over relatively short periods of time, communities emerged. Over slightly more time, some communities began to overshadow others in size and importance. Over even more time, fewer and fewer persons were needed to work the land and more and more labor was needed in urban areas to produce manufactured goods.

Urban economics analyzes the process of urbanization – the movement of persons from rural, agricultural cultures into urban non-agricultural centers. The discipline also assesses the timing and the distribution of urban centers. Urban economics, then, is analysis that is guided by theory and acceptable applied practices. The analysis practiced in urban economics is designed to be grounded in the practical and geared to assist decision making and policy development. The analysis borrows from all social science disciplines if it is to be done right. Political science guides our understanding of the processes and structures of governance the shepherd change over time. Geography and the widespread use of geographical information systems (GIS) along with greater access to geographical or spatial statistical measures allows us to better account for the distributions of change in space. Sociology informs of regional and, perhaps, cultural antecedents that may influence the patterns and pace of change in an area. Finally, we add urban and regional economics, which helps to explain the rationale of urbanization.

The spatial dimension of urban analysis is very important: much of what constitutes modern day economic development involves second-guessing where development is likely to occur or intervening in places that have some particular spatial disadvantage. Traditional economic theory is spatially ignorant. It assumes things like a featureless plane, universal consumer knowledge, no barriers to trade, and rational behavior. Add to that our own ingrained stereotypes of cities, which are informed by our own particular life experiences, and we often find that my idea of a city does not match yours. For those not from Chicago, for example, it is, perhaps, just a place; granted, it is a big place with lots of things like professional sports, a mercantile exchange, and a host of cultural and commercial opportunities, but for us who don’t live there it is just a place. Its nuances, depth, and dimension are beyond us, as also are its necessary and critical linkages with other communities in the region and the nation. We are mostly unmindful of the cultural and industrial inter-relationships with the rest of the country and the world that without which Chicago wouldn’t be Chicago.
Similarly, when we think in terms of small or medium-sized towns and cities we often overlook the critical linkages that these communities may have with other cities and economies in the region or in the nation, or their relationship to national consumption characteristics. We may contrast, for example, a typical rural, farm-dependent community with a western logging/forestry community with another, for example, that depends primarily on tourism with another that acts as a regional trade center. While each community’s core of economic activity may appear similar, in fact each is serving distinct economic roles within a regional or even a national economic system.

In short, economic inter-relations in space are important components of urban analysis, and without them, we do a poor job of measuring economic factors and the forces of change. In reverse, understanding urban forces and elements of changes often helps us to gain insight into the dominant trends influencing rural America. As we assess the roles of technology, the demands for labor in rural areas, the character and flavor of economic change in urban areas, we can get an intuitive handle on the types of jobs the future holds and the forces that attract rural youth away from rural areas.

An understanding of urban economies, or more loosely the “regional sciences,” is essential for planners. Urban economics and urban analysis helps

- inform economic development activities
- assist in broad-based local government policy development in the areas of land-use planning, fiscal capacities, and social needs like housing, health, welfare, recreation, and cultural programs.
- Allows for measures of the effectiveness of policy decisions
- Allows for measures of the community and region-wide impacts of economic change
- Lets us better study and understand the social consequences of economic change.

With regard to the governance of a region and the ostensible distribution of private goods and services, a study of urban economics allows us also to assess both efficiencies and equities:

Efficiencies refer to the obtaining the most productive uses of private and public resources.

Equities are the concerns that we marshal in light of our characterization of the distribution of the region’s resources relative to the distribution of the region’s incomes. We may also characterize equity as distributive justice, or Rawl’s elegant and simple term “fairness.”

Heilbrun gives us three simplified phases of human settlement:

1. Agricultural self-sufficiency – the most primitive of organizations in modern society.
2. Systems productive enough to yield small surpluses – the surplus enters trade and supports some urban settlement.
3. Industrial-based urbanization in which economic activities are highly specialized, agricultural and other necessity outputs are high per worker and whose limits to urbanization are limited only by the amount of productivity gains made in agriculture (or in some other critical resource that is widely demanded – such as oil – which can be traded for technology and other essentials).
Ultimately, though, on a global basis, agricultural productivity and sustainability is the necessary prerequisite to urban growth. This is, of course, a decidedly western or “first world” view. There are also cultural/religions determinants historically of urban growth. But in the main, these were by far the exception than the rule.

There are three logical and necessary characteristics of urban economic growth historically:

1. Increased industrial productivity, made possible by
   - water, steam, and fossil fuel-powered industries
   - increased mechanization and industrialization
   - specialization of labor
   - more recently, the broad development of infrastructure capable of supporting industrial production, including physical, electro/digital, and intellectual capital.

2. Transportation system development
   - waterways – hence the emergence of coastal and inland ports as early major trade centers
   - railways – allowed efficient and consistent exploitation of the nation’s interior resources
   - overall increased mobility and a reorientation of economic power in the nation spatially
   - allowance for re-defining the extent of exploitable resources, which led, therefore, to new nodes of urban efficiency.
   - modern information systems, broadband, and other digital conveyances

Some would argue that modern communications could be a logical, distinct aspect of urbanization. Indeed, they may be correct, but communications revolutions historically occurred simultaneously with transportation enhancements. The net effects of continuous declines in communications costs are the increased spatial separation of the functions of industries. What we often now characterize as a communications revolution is merely an incremental change in communications flow, cost, and timing relatively to a decade ago. It is a steady and non-linear progression.

3. Increased agricultural productivity
   - Linked to industrial, transportation, behavior, and scientific advances
   - Over the decades there has been a persistent decline in the number of farms and farms, a concomitant increase in average farm sizes, and incremental gains in yields.
   - At the same time, overall food costs as fractions of household budgets have declined

All of this gives rise to an intriguing simultaneous system:

\[ \text{Urbanization} = f(\text{agricultural productivity, technology transfer, transportation, etc.}) \]
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[Discussion on the consequences of this system and the relationship to food production, rural settlement, urbanization. The simultaneity of agricultural production giving rise to urbanization, which then yields greater industrial efficiency, which then yields increased ag production, and so on. This gives rise to inevitable tensions among those that would promote greater regional efficiencies, as would be represented by urbanization, versus those that would bemoan the erosion of rural values and the value of rural areas. In more recent times we can characterize the “rural fundamentalists” vs. the “urban utilitarians.” All of this, though, has much more ancient roots and finds itself in centuries’ old arguments of landed rights vs. merchant rights. One presupposes the primacy of landed interests; the other presupposes that the value of the market supercedes tradition-rooted or family-rooted rural claims.]
Later on we begin to focus on degrees of urbanization, and we introduce urban hierarchies.

Agglomeration

Agglomeration occurs when enough industries locate in a particular area such that they stimulate savings in production unit costs.

We distinguish between two types of agglomeration:
1. Localization economies, and
2. Urbanization economies

Localization economies are those in which there are specialized suppliers of goods and a specialized labor pool. The linkages among many industries in the region are highly articulated. The garment industry in New York City is the classic example of a localization agglomeration, as also is the overall concentration of broadcast headquarters activity in New York City or in the Los Angeles areas. The concentration of garment and fashion production in New York City allows for very specialized clothing and apparel producers along with very specialized design and production labor. The concentration of broadcast production facilities as well as production talent in New York and Los Angeles allows for production efficiencies that otherwise are not possible in other places of the county.

Urbanization economies (or agglomerations) are made possible by the sheer size of an area rather than by a specific specialization of labor and supply. Accordingly, there are particular higher order economic functions that only make sense within the more highly developed urban structure. Banking, specialized law and medicine, higher education, and specialized business and retail services are all examples.

Agglomeration happens because the primary benefit of urbanization is that the time it takes to do economic transactions is minimized: the time and distance that materials and people must travel is minimized.

Why, then, don’t we get one great big city?

1. Resources are scattered.
2. For some needs, a simple village is adequate, which explains both the historical pattern of settlement (as in a state like Iowa) and the durability of this distribution of communities.
3. People desire a range of choices – for a very large fraction, both choice and economics dictate an urban residence. For others, an urban residence is not necessary.

There are, of course, diseconomies of agglomeration: as populations and population concentrations increase, some efficiencies are gained in production, but some costs rise as well. Pollution, crime, congestion are good examples of diseconomies. There are other diseconomies associated with business cycles: Detroit and the fortunes of the auto industry, the Pacific Northwest and the performance of Boeing, southern California’s linkage to both the defense industry and to silicon chip production. Increased concentrations in a particular form of industry can have devastating consequences for a region. Some areas are also prone to boom and bust cycles: Houston, Dallas, and Denver, for example.

The diseconomies of agglomeration must also be considered in light of equity concerns. If the diseconomies are caused by some groups or institutions but borne by others then the community will necessarily need to address these concerns.
**Classification of Cities**

This course emphasizes economic, spatial, and to some extent the social and fiscal characteristics of cities. It is important, therefore, to understand what we mean by cities and, maybe even more importantly, how data are organized for analysis. Good analysis requires specificity in the terms that we use – we must not be indiscriminate when we characterize our towns even though that for most of us “city” and “urban” are subjective classifications.

We do have standard classifications. They come from the U.S. Census and with only minor modifications have been relatively consistent over time.

**Place** We generally call all incorporated communities places. Incorporated means that the community has incorporated within its respective state's laws government the establishment of a civil government. Within this we get rural places, urban places, urbanized places, and metropolitan places. **Rural places** have populations less than 2,500. **Urban places** have populations greater than 2,500 (or a population density of 1,000 per square mile) **Urbanized places** are places regardless of size that are part of a larger urbanized area, usually consisting of a core city, a **metropolitan place**, that has a population of 50,000 or more.

**MSA** Micropolitan statistical area. Usually has one central urban place of 10,000 – 49,999 in population. Sometimes is composed of two communities (Keokuk and Ft. Madison in Lee County and Sioux Center and Orange City in Sioux County are both considered micropolitan communities).

**MA** Metropolitan Areas contain a central city with a population of 50,000 or greater or are a contiguous set of cities whose population is 50,000 or more.

**CMSA** Consolidated Metropolitan Areas are comprised of two or more MAs that are contiguous with one another (the Quad Cities in Illinois and Iowa or the Omaha – Council Bluffs region of Nebraska and Iowa are good examples of smaller CMSAs).

**Rural** By definition, rural entails those living in rural places (< 2,500) or those not living in places that are

- Rural farm (describe the definitions of a working farm)
- Rural nonfarm (primarily scattered acreages and small, disconnected subdivisions)

It is often important for economic analysis and analysts to distinguish carefully what we mean by rural (i.e., whether we are really talking about farm issues or nonfarm issues). For many persons it becomes a problem of perception. There are rural portions to metropolitan counties. Some persons characterize all nonmetropolitan space as rural. For persons living in rural areas common characterizations of rural and urban may differ significantly from urban characterizations.

There is another set of classifications that are commonly associated with Calvin Beale of the USDA that allows for the standard classification of counties instead of places and categorizes these counties by their relative degrees of urbanization. I present these for two reasons:

1) I like them – I’ve tested them in a number of different venues in Iowa and nationally and found them to very useful.
2) Whether you like them or not, we do not get good information about non-MSA cities; accordingly, we are stuck with doing our urban or municipal analysis at the county level.
The rural-urban hierarchy “Beale” codes:
0. Very large central city (and county) of 1,000,000 or more.
1. MSA counties adjacent to a very large central city (above).
2. MSA counties with populations above 250,000 not adjacent to a large central city.
3. All other MSA counties.
4. Large urban counties (a city with 20,000 or more) adjacent to a MSA.
5. Large urban counties that are not adjacent to a MSA.
6. Smaller urban counties (city sizes 2,500><20,000) adjacent to a MSA.
7. Smaller urban counties not adjacent to a MSA.
8. Rural counties (no town of 2,500 or more) adjacent to a MSA.
9. Rural counties not adjacent to a MSA.

These characterizations are collapsible. If you are working in a large metropolitan region, you may be interested in distinguishing between the first two and collapsing all others. In Iowa it is useful to collapse the codes to 5 categories: MSA, urban adjacent, urban non-adjacent, rural adjacent, rural non-adjacent. Or, we could collapse comparing adjacency versus non adjacency.

Determinants of City Structure and Function

At the outset it is important to remember that when we classify cities by structure, function, etc., our classifications are stereotypical idiosyncratic.

There are two primary forces in urban development:

1. Centralization -- specialization, agglomeration, other spatial efficiencies, and
2. Decentralization -- suburbanization, sprawl, restructuring of the spatial dimensions of economic activity.

Much of modern urban study, design, and dynamics represents the study of the forces of centralization versus decentralization. The two create an natural friction.

The development of transportation systems, both within cities, and on an inter-regional basis, is an important component of city structure and potential size.

1. Railroads, streetcars, subways, and elevators coupled with steel frame construction (Elisha Graves Otis, 1952) and the invention of the elevator allowed for significant concentrations of economic activity and populations. These allowed for highly dense levels of growth among the nation's northeastern and much older cities -- those that had matured by 1920.

2. The dominant feature of more modern cities (primarily western and southern) is larger land areas, lower population density, and higher capabilities of handling automobile, truck, and bus traffic. These developed primarily after 1920, and most likely after WWII.

3. Another consideration of industrial growth is the needs of manufacturing. Early manufacturing usually required close access to ports or rail hubs to both receive raw products and to ship finished goods. These generally were central city areas requiring highly efficient uses of land, i.e., multi-storied plants, a sufficient pool of skilled and semi-skilled labor, and perhaps other benefits of agglomeration such as access to specialized tool and machine works. As assembly line techniques emerged, as worker concentrations were able to decrease due to mass transit and automobiles, firms were able to rotate or migrate out of central cities in order to adopt new technologies and new techniques of manufacturing. Much of the evolution of many of the
nation’s interior cities evolved around the new nodes of manufacturing, transportation, and technology relocations to the peripheral areas, thereby necessitating reorganization of supply, labor, and land use patterns.

We’ll deal with some of the more particular aspects of urban structure and function (or potential function) when we turn to discussions of location and central place theories.

The future form of cities.

After WWII, several things happened at about the same time.

- Agricultural productivity began increased strongly, as also did industrial production,
- investment and deployment of the interstate highway system (ostensibly for defense purposes),
- rapidly growing demand for skilled manufacturing labor and higher educated labor,
- the baby boom,
- relatively rapid, if not exponential technical advances in consumer and industrial products, and
- the monopoly position in many industries enjoyed in the U.S. that allowed for tremendous growth in wealth.

All of these factors in some ways influenced the structure and functions of the modern city.

Modern changes may imply both stability and potential instability for cities:

Changes in manufacturing techniques brought on by global competitiveness factors, increased communications capabilities, and higher transportation efficiencies may allow even greater industrial decentralization or more strategic industrial location in the future.

Alternatively, a sustained period of high energy prices, for example, may force greater industrial and population concentrations to minimize energy usage and maximize transportation efficiencies.

Technology changes, primarily in telecommunications, have forced us to rethink our needs to be physically present on the job-site. In these instances telecommunications substitute for transportation needs. But as of yet these types of changes are more anecdotal than real.

In short, we do not know, we can only infer, the structure and dominant functions of the future city. The best guidance we have are traditional, and well-thought-out characterizations of historical and contemporary industrial growth (location theory) and of how cities emerge (central place theory).

As we move into the future, we can anticipate several influences on the future forms of urban development:

Technology broadly:
- Transportation
- Communications
- Workplace changes
- Replacement for labor

Factors influencing production costs:
- Labor supply
- Energy and energy policy
- Availability of developable land

Environmental constraints:
- Our understanding of environmental health is still in its infancy
- Many modern reforms affecting city structure, composition, and habitability are founded in mitigating the “unhealthy” aspects of urbanization.
- Contingent on local and regional abilities to absorb externalities.

Location Theory

One of the most prevalent elements of urban studies is the study of location theory: theories of why firms chose specific sites.

Location theory gives us ways to characterize the location of firms and, hence, the relative preference a firm will express for one site over another and the general reasons for those preferences.

Shaffer gives us three general schools of thought plus an emerging school for characterizing firm location:
1. Cost – Firms that are least cost sensitive
2. Demand maximizers
3. Profit maximizers
4. Behavioral School
5. Institutional
6. Product cycle

1. Cost. Least cost sensitive firms seek to minimize their total production costs, especially transportation costs.

There are two types of costs: inputs and outputs

Here we are assuming that ton per mile costs are relatively equal. b+c are input distances and a=output distance. X, Y, and Z equal weights. The firm then seeks to minimize ton miles:
Under the least costs school, we usually think of 3 underlying forces determining firm locations.
1. transportation costs
2. overall costs of inputs
3. economies and diseconomies of agglomeration

Firms may emphasize one over the other, which further allows us to characterize least-cost firm types.

Least cost orientations

1. Transport costs.
   a. Close to materials locations – high bulk to value ratio – are generally **weight losing** operations, like lumber mills, ore refining. Typically non-perishable, non-fragile, although fruit and vegetable canning and meat packing tend to locate amid production centers. Can also characterize break of the bulk points, like Buffalo, NY, and Mississippi River ports.
   b. Market-oriented locations – lower bulk to value ratio -- tend to be perishable, more fragile, and possibly weight-gaining. Examples include bottling, brewing, baking, and automobile manufacture.

2. Production (input) costs – here, transportation costs are relatively less important.
   a. labor oriented – low labor costs, usually in labor intensive industries, e.g., textiles and modern meat packing plants.
   b. Power/energy oriented – high fuel inputs, will search for cheaper power, e.g., aluminum and other specialty metals manufacture.

3. Agglomerations
   a. Localization orientation – need for specialized services and labor, e.g., apparell, broadcasting, financial services, defense, silicon technologies.
   b. Urbanization orientation – need face to face communications with suppliers and customers, e.g., corporate headquarters, advertising, law, investment banking.

It should be clear that all firms, to the extent that they are able, seek to minimize costs in all of these factors and that there are relatively few pure types. Still, I think that they are useful for characterizing firms and identifying their locational incentives. Each subsumes a “least cost” objective. The typologies are useful for analyzing goods producing firms of the production of specialized services.

Shaffer, however, introduces us to demand maximization factors where sellers of goods select sites to control as large a market area as possible. (Demand sensitive firms)

Factors:
1. sells to a spatially distributed market
2. customers and resources are ubiquitous
3. customers are price sensitive
4. transport costs are uniform spatially
5. abnormal (monopoly) profits are possible; therefore, expect competition
6. no barriers to entry