11.481J / 1.284J / ESD.192J Analyzing and Accounting for Regional Economic Growth
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B. AGGLOMERATION ECONOMIES AND ECONOMIES OF SCOPE

1. **Internal economies (diseconomies), also called scale economies:** these accrue to a given firm in the internal production of a given facility as its scale of output increases. As output expands, economic theorists show that the average cost of production first declines and then generally begins to rise beyond a given level of output.

2. **External economies (diseconomies):** "Externalities are variously known as external effects, external economies and diseconomies, spillovers, and neighborhood effects . . . [they] involve an interdependence of utility and/or production functions." *The Dictionary of Modern Economics*, p. 148.

   a. **Localization economies (diseconomies):** these accrue to all firms in a single industry at a single location.

   b. **Urbanization economies (diseconomies):** these accrue to all activities at a single location as the size (population, output, income, and wealth) of the area increases. Isard also refers to them as economies of urban concentration.

   c. **Spatial-Juxtaposition economies (diseconomies):** scale-economies (other than size) factors, such as quality-control, training, and social-welfare economies (diseconomies), that result when an industrial complex is located at only one site.

   For additional details on these agglomeration economy concepts, refer to Walter Isard, 1975, *Introduction to Regional Science*, Englewood Cliffs, NJ: Prentice-Hall, Inc., pp. 113-117.

   Internal and external economies (diseconomies) are referred to jointly as agglomeration economies. The agglomeration and deglomeration that occurs as cities (regions) change lead to "*the concentration and deconcentration or dispersal of industrial and other activity*" (Isard, 1975, p. 113).

3. **Economies of scope:** economies that accrue by distributing some of the firm's fixed costs over a number of related product lines.

   According to Lazonick (p. 230), "How many scope economies any one product division contributes to the company's cost performance depends on the extent of the market for its product--which, like the economies of scale that it achieves on the basis of its own divisional assets, in turn, depends on its ability to plan and coordinate its specialized division of labor."

   For additional details, see William Lazonick, 1991, *Business Orientation and the Myth of the Market Economy*, Cambridge, England: Cambridge University Press, and Alfred D. Chandler, Jr., 1990, *Scale and Scope: The Dynamics of Industrial Capitalism*, Cambridge, MA: The Belknap Press of Harvard University Press.

4. **Dispersal Economies (diseconomies):** these occur to a firm as it interchanges with its various suppliers and customers along an external local or global supply chain.

B. Agglomeration economies (diseconomies): (1) internal, (2) external (localization, urbanization, juxtaposition or social), and (3) scope.

Agglomeration Concept	Type of Agglomeration Economy/Diseconomy
Old concepts	
Cluster	Internal, Localization, Scope
Industrial Complex	Internal, Urbanization, Scope
Industrial District	Internal, Localization, Scope
Growth Pole/Center	Internal, Localization, Scope
New concepts	
Chain (Consumer-driven)	Scope, Horizontal networks
Chain (Producer-driven)	Internal, Vertical networks
Chain (Supply)	Internal, Vertical networks, Dispersed
Interfirm Network	Decentralization, Scope

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NEOCLASSICAL AND ALTERNATIVE GROWTH (LOCATION) THEORIES

Product Life-Cycle Analyses (Norton and Rees)

What is a product? What is the product life-cycle?
How many stages are there in the product life-cycle?
What assumptions do Norton and Rees make explicitly or implicitly?
What are the main characteristics of each stage?
What difference would it make if there were more (fewer)?
How does it relate to neoclassical regional growth theories?
What are basic problems with the Norton and Rees arguments?
Is the product life-cycle a theory? Why or why not?
What evidence would you need to apply the product life-cycle analysis?
Is it relevant for industrialized countries? For nonindustrialized economies?

Select two products that existed prior to 1960 and explain their product life cycles (e.g., typewriter, horse and carriage, telephone, car, the game Monopoly, banking services, wristwatches)

Select two new products and explain their expected product life cycles (e.g., cellular phones, Pokemon games, electronic stock-exchange trading)
For which products is a product life-cycle analysis most appropriate?

How relevant would a product life-cycle analysis be for each of the following: agricultural, mining, construction, manufacturing, and/or service sectors.

Profit Life-Cycle Analyses (Markusen)

What does Markusen say about neoclassical growth theories? Product life cycle analyses?
What are the basic characteristics that distinguish each stage of a profit life-cycle?
What are basic problems with Markusen's arguments for a profit life-cycle?
What key variables change over the profit life-cycle?
How does the spatial effect of the profit cycle vary from that of the product cycle?
How may this affect regional growth?

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DEPICT BELOW THE TWO ALTERNATIVE VIEWS OF REGIONAL GROWTH

Product Life-Cycle Stages

Profit Life-Cycle Stages

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QUESTIONS FOR CONSIDERATION

A. Some questions to consider as you do the regional growth and location theory readings.

1. What is a region?

2. What is the difference between a regional growth theory and a regional growth strategy?

3. What is the difference between a neoclassical regional growth theory and a location theory?

4. What makes it a regional versus a national one?

5. What factors contribute to a "useful" growth (location) theory or strategy?

6. How would you test quantitatively and/or qualitatively whether or not a growth (location) theory or growth strategy is "useful"?

7. Of the theories and strategies you have read, what factors distinguish them in terms of (a) implicit or explicit assumptions, (b) general relevance, (c) relevance for the 21st century?

B. Consider each of the following from a neoclassical and from an alternative growth theory perspective:

1. Why do planners think that regions must grow?

2. What are some of the problems with how we measure growth?

3. What causes a region to grow?

4. How can a government intervene in a region to assist/retard growth?

5. What are prime factors attracting industries to a particular location? Does regional growth play a role? Is so, what role?

C. Profit-life Cycle Theory (Go over same points as for product life-cycle.)

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INTERFIRM AND EMPLOYMENT NETWORKS

Networks (DeBresson and Amesse)

What is a network?
What is a network of innovators? What *causes* innovators to network?
What *functions* does a network perform? To what extent can such networks affect regional growth?
What relationship, if any, would Schumpeter's entrepreneur have on such networks?
What are characteristics of interfirm networks?

Which of these concepts would you use to explain the current rapid (slow) growth in Massachusetts (or substitute your own country, state, or other regional entity)? Why?

What is a network?

". . . a network organization linking firms or economic agents represents an intermediate 'system of governance' that lies between hierarchic organization ('the firm') on the one hand, and 'classical' or spot transactions ('the market'), on the other." Teubal, Yinnon, and Zuscovitch. 1991. "Networks and Market Creation." *Research Policy*, p. 381. The governance within networks requires informal reciprocity and development of trust.

Types of networks:
- interfirm (component supplier-assembler networks and user-producer networks),
- employment networks,
- innovator networks,
- information and communication networks,
- social networks,
- political networks.

Characteristics of interfirm networks:

1. recurring transactions and interactions;
2. long-run stable relationship;
3. creation of pool of knowledge; therefore, contributes to interfirm learning; and
4. may or may not cross spatial boundaries (compare interfirm networks within an industrial district, such as Silicon Valley, versus networks across oceans, such as communication networks).

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Factors leading to the creation of networks:

1. strong technological and market uncertainties;
2. systems dimension of technology for which multiple sets of complementary technological development are needed;
3. quasi-rents result from the new collaboration of actors; and
4. thus, the sharing of uncertainties, risks, and costs in order to achieve benefits that outweigh the costs of cooperating/collaborating.

Distributional implications: networks may help "level the playing field." They may, however, help increase the major economic power and control of large firms, while small firms may have a different form of economic power in terms of co-dependency relations. Some analysts argue that spatial distribution of an interfirm network is bound by the region in which it begins. Production units that belong to the same large enterprise, however, may locate across spatial boundaries.

Review of three theories

- Product cycle: focus on the changing stage of a product: development to production to finally disappear from the market;

- Profit cycle: focus on people who make decisions of the production process, profit is the primary force that determines their decision.

- Theories on networking: explain a region's growth/decline by examining the interfirm network of the region.

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OVERVIEW OF LOCATION THEORIES

Characteristic	Neoclassical Theories	Growth Pole Theories	System Theories	Structural Theories
Types of Markets	Competitive or monopolistic	Competitive or monopolistic. Size of market is limited at first. Generation of income expands market.	Not clearly specified. Reproduces uneven distribution of activities. No emphasis on region, only on city. Forward linkages are location decision. Backward linkages are structure of industry.	Not clearly specified. Reproduces uneven distribution of activities.
Factors of Production	Capital and labor are key factors. They are mobile and respond to regional differentials in wages or profit.	Stress on role of capital. Sequencing of investment is critical.	Stress on advanced division of labor. Extensive international division of labor. Movement of factors dominated by corporation. Generate own internal sources of capital. Technology and information are critical, not land, labor, and capital.	Wages are not only determination of industrial location. Skill and availability of labor important. Labor is less mobile than capital. Spatial division of labor is an important consideration. Level of organization and worker consciousness given consideration. Advanced division of labor exists. Changes in level and character of labor lead to changes in investment. Technical innovation changes social division of labor.

OVERVIEW OF LOCATION THEORIES (continued, p. 2)

Characteristic	Neoclassical Theories	Growth Pole Theories	System Theories	Structural Theories
Role of State	State is there to ensure that market forces are operating effectively.	State takes active direction in the formal and informal planning of investment.	Power of state is organized Territorially. Market competition is allowed to operate.	Industrial system and market are not self-regulating.
Industry Structure	Small, autonomous, undifferentiated firms and monopolies are major types dominant in the economy.	Large firms are encouraged because of the need to achieve economies of scale.	An industrial system. Corporations plan. Industries are rational. Monopolies and oligopolies play important role. Industrial system is the same whether capitalist or socialist.	Capitalist mode of production determines social relations of production. Capitalists have control over forces of production. Monopolies and oligopolies play important role.
Production	Spatial optimization and cost minimization are prime goals. Equilibrium is assumed to exist in the long run.	Spatial concentration around key (propulsive) industries. Entrepreneur plays a key role. Unbalanced growth is the production strategy.	Corporate, product, and city system. Product cycle affects location. Waves of innovation play key role. Disequilibrium is assumed to exist both in the short and the long run. Three kinds of linkages: material, service-information, and command (job control).	Accumulation has priority over location. Technical progress is result of drive to accumulate. Choice of technique depends upon control and economic calculation of capitalist. Disequilibrium is assumed to exist both in the short and in the long run. Demand for labor power changes--deskilling versus increased demand for new skills.

OVERVIEW OF LOCATION THEORIES (continued, p. 3)

Characteristic	Neoclassical Theories	Growth Pole Theories	System Theories	Structural Theories
Commodity Trade		Trade is initially limited, but as markets expand, trade will be augmented.	Corporations control movement of goods.	
Implications for Location	Location chosen is most efficient in respect of market, labor, and materials. Location is dependent upon investment, but investment decisions dominate over location decisions. Differences in additions to existing plants versus replacement.	Firms will group around development poles initially, but the income will "trickle down" to all in the economy.	Decentralization of activity within metropolitan areas and within nation. Reject neoclassical location theory. Disintegration of core-periphery relationships. Location changes caused by changes in industry structure. Location seen as key to economic growth.	Location is result of historical and structural conditions governing organization of industrial capital. Corporation is agent of capital, rather than technology. Location decisions cannot be treated separately. Structure of economy makes spatial differentiation possible.

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SECOND-TIER CITIES--ANN R. MARKUSEN, YONG-SOOK LEE, AND SEAN DIGIOVANNA

Second-tier cities defined: "spatially distinct areas of economic activities where a specialized set of trade-oriented industries takes root and flourishes, establishing employment- and population-growth trajectories" (p. 3).

The authors argue that to understand the complexities of location decisions in the context of the industrial-district formation process, analysts must consider the interactions of firms across space.

They do not focus on the interrelationships within the industrial district--called "local embeddedness"

They do emphasize the importance of "nonlocal embeddedness" as well, by which they mean the relationships among firms, within firms, or public and private organizations.

Distinguish three types of second-tier cities:

1. hub-and-spoke structure, where suppliers spread out around the key firms (the hub) like spokes on a wheel;

2. state-anchored districts, where a public or nonprofit facility dominates the district; and

3. satellite platforms, which are groupings of branch facilities of multiplant firms.

Markusen shows how these three types contrast with the neoclassical economic Marshallian industrial district--a fourth type of city comprised of a craft-based group of small locally owned firms using new technologies.

Several limitations of analysis

First, six of the cases (the three U.S. cases and three of those in other countries) fall into the second category of state-anchored districts in which some type of public or nonprofit facility (e.g., a defense plant, government offices, military base, or university) dominates the district.

1. Campinas (top-ranked university),
2. São José dos Campos, (aerospace complex), both in Brazil;
3. Taejon (government research complex) in South Korea;
4. Colorado Springs (military base),
5. Silicon Valley (defense plant), and
6. Seattle (defense plant) in the United States.

Is this characteristic of most second-tier cities or a limitation in the author's selection of cities?

Second, the authors do not clearly state the method by which they selected countries, cities, firms, as well as whom to interview.

1. Why were the four countries of Brazil, Japan, South Korea, and the United States selected? The selection of South Korea and the United States occurred because Park and Markusen met at a conference in 1989 in Seoul, Korea. They provide limited rationale for expanding to Brazil and Japan.
2. How did the authors decide which cities to select? Those selected do not appear to be the only, or even the main, rapidly growing second-tier cities. Why were five cities selected in South Korea, but only four in Japan and three in Brazil and the United States?
3. How were the firms selected within each city? Although the authors provide some information, they could have discussed this selection for each country in the introductory section of the book and also indicated for each city which and how many firms they interviewed.
4. Who was interviewed? Specific examples for each of the cities are needed to supplement the generic discussion of how to make these selections.

Third, in the method part, Markusen lays out a "visual technique for mapping firms onto regions." I did not find this approach particularly helpful, but I admit a bias to presenting information in a tabular form, rather than as diagrams.

I believe that all the information in her Figure 3.1 (Firm Mapping Onto Local and NonLocal Space) could have been presented as a table. She presents a set of nested rectangles for each firm to be studied, with the four sides of the rectangle representing suppliers, competitors, customers, and trade associations.

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I propose Table 1 as an alternative example. The first rows in the table show all the suppliers by Firm A to its Customers (1,2.3), with the Competitors (e.g., Firms A, B, C, D) separated from the other customers. The first part of the row shows the transactions for the firms internal to the region, while the second part of the row shows the transactions for the firms external to the region. These rows represent the sales from all the different types of suppliers (resources, materials, machinery, labor, finance, and supplier associations).

The next set of rows represents the Competitors. Ideally, all of the information would again be separated into the type of transaction (as for the firm under study). The final row indicates the interactions with the trade association. Whereas the first rows would be in value terms, the trade-association data would be presented as physical units, indicating number of training meetings, or other such details.

This is obviously one form of an input-output table or social-accounting matrix, but I think the use of such a table would clarify the details of the transactions represented in Figure 3.2 for the hypothetical Kidsmart software firm. Most regional researchers are aware of input-output methods, so that the researcher would not have to learn a different (and I claim more cumbersome) way of portraying relatively straightforward relationships.

This discussion is based upon my review of the Markusen book:

Karen R. Polenske. 2001. Review of book *Second-Tier Cities: Rapid Growth Beyond the Metropolis*, by Ann R.Markusen, Yong-Sook Lee, and Sean DiGiovanna, editors. *American Planning Association (APA) Journal* 67 (4): 47.

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SECOND-TIER CITY TABLE
SAMPLE FIRM INTERNAL AND EXTERNAL TRANSACTIONS
PURCHASERS

	LOCAL REGION							***EXTERNAL REGION***							
	Customers			Competitors				Customers			Competitors				
Competitors	1	2	3	A	B	C	D	1	2	3	A	B	C	D	

PRODUCERS
LOCAL REGION

Suppliers
Resources
Materials
Machinery
Labor
Finance
Associations

Competitors

A
B
C
D

Trade Association

EXTERNAL REGION
Suppliers
Resources
Materials
Machinery
Labor
Finance
Associations

Competitors

A
B
C
D

Trade Association