

Regional Development Theory: Conceptual Foundations, Classic Works, and Recent Developments

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This annotated bibliography gives an overview of the theoretical literature on regional economic growth and examines its conceptual foundations, major competing paradigms, and recent developments. The overview concludes with a discussion of the policy implications suggested by this body of theory. Throughout the review, three themes are emphasized: (1) the theoretical predictions regarding the convergence or divergence of per capita incomes across regions over time, (2) the assumptions regarding the importance of internal and external scale economies to regional economic growth, and (3) the role of space in shaping regional labor market outcomes.

Keywords: *regional development theory; regional planning; economic development; convergence*

TABLE OF CONTENTS

- I. Introduction
 - A. What Is a Region?
 - B. Conceptual Foundations of Regional Economic Development Theory

- 1. The Interregional Convergence Hypothesis
- 2. Location Theory and Regional Science
- 3. External Economies
- 4. Models of Spatial Competition
- 5. Central Place Theory
- C. Alternative Theories of Regional Economic Development
 - 1. Theories of Regional Economic Convergence
 - a) Export Base Theory
 - b) Neoclassical Exogenous Growth Theory

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2. Theories of Regional Economic Divergence
 - a) Cumulative Causation Theory
 - b) Growth Pole Theory
 3. Structuralist Theories
 - a) Stage/Sector Theories
 - b) Profit/Product Cycle Theories
 - c) Industrial Restructuring Theories
 - d) Flexible Specialization and Network Theory
 - e) Marxist Theory
 4. Political Institutions and Regional Economic Development
 - a) Growth Machine Theory
 - b) The New Institutional Economics
 5. Emerging Neoclassical Perspectives
 - a) Endogenous Growth Theory
 - b) The New Economic Geography
 6. Conclusion: Toward an Integrated Theory of Regional Economic Development
- D. Theoretical Perspectives on the Role of Regional Development Planning and Policy
- E. References
- II. Annotated Bibliography
- A. What Is a Region?
- B. Conceptual Foundations of Regional Economic Development Theory
1. The Interregional Convergence Hypothesis
 2. Location Theory and Regional Science
 3. External Economies
 4. Models of Spatial Competition
 5. Central Place Theory
- C. Alternative Theories of Regional Economic Development
1. Theories of Regional Economic Convergence
 - a) Export Base Theory
 - b) Neoclassical Exogenous Growth Theory
 2. Theories of Regional Economic Divergence
 - a) Cumulative Causation Theory
 - b) Growth Pole Theory
 3. Structuralist Theories
 - a) Stage/Sector Theories
 - b) Profit/Product Cycle Theories
 - c) Industrial Restructuring Theories
 - d) Flexible Specialization and Network Theory
 - e) Marxist Theory
 4. Political Institutions and Regional Economic Development
 - a) Growth Machine Theory
 - b) The New Institutional Economics
 5. Emerging Neoclassical Perspectives
 - a) Endogenous Growth Theory
 - b) The New Economic Geography
 6. Conclusion: Toward an Integrated Theory of Regional Economic Development
- D. Theoretical Perspectives on the Role of Regional Development Planning and Policy
- E. Other Reviews of the Regional Development Theory Literature
- III. Acknowledgments
- IV. Author Index
- I. INTRODUCTION
- “How do regions grow?” “Why do some regions grow more rapidly than others?” “Why are differences in levels of social welfare across regions so persistent?” These central questions have attracted the attention of a diverse group of scholars during the past fifty years. Topics that were initially of interest only to economists and geographers are now being investigated by sociologists, political scientists, and researchers from other social science disciplines. This growing interest in regional development studies is due in part to the recognition that the processes driving innovation and national economic growth are fundamentally spatial in nature. In short, “space matters.”
- This review and annotated bibliography give an overview of the theoretical literature on regional economic growth. The review is intended to serve as both a summary of the state of the field and an overview bibliography for use in a graduate course on this topic. Given that this field of inquiry spans several works in several disciplines, no attempt was made to give a comprehensive survey of all works in the field. Instead, I reviewed seminal works and comprehensive overviews of the most important theoretical concepts. Empirical works were not examined unless they contributed substantially to theory development. The annotated bibliography follows the same structure as the introduction. Within the annotated bibliography, references are organized alphabetically by section, but not every reference has a separate explanatory paragraph. The reference list at the end of the introduction only includes works not discussed in the annotated bibliography. To locate references in the annotated bibliography, the reader may refer either to the author index (section IV) or the section of the annotated bibliography that corresponds to the section in the introduction.
- The review places emphasis on three themes that are discussed throughout the regional development literature: (1) the theoretical predictions regarding the con-

vergence or divergence of per capita incomes across regions over time, (2) the assumptions regarding the importance of internal and external scale economies to regional economic growth, and (3) the role of space in shaping regional labor market outcomes. The final section of the paper examines several seminal articles in the regional economic development policy literature in light of the theories discussed to determine what theory has to say about the role of policy and planning in achieving the social welfare objectives of efficiency and equity.

A. What Is a Region?

What is meant by the term *region*? Although all regional development theorists are interested in understanding the process of regional growth and decline, there is surprisingly little agreement among researchers as to how regions should be defined. Some theorists merely presume the a priori existence of a cohesive geographic and economic entity known as a region, whereas others base theory on more explicit definitions. A few of the most common approaches to defining regions are reviewed below.

Christaller (1933) and Losch (1954) provide an early approach to defining a region. In Christaller and Losch's central place theory, regions are defined as hierarchical systems of central places or cities. Each region has a small number of large higher order cities and a large number of smaller lower order cities. The order of a city is determined by the diversity of goods offered in the city, which in turn is determined by the relative size of market areas for different goods. Cities are assumed to import goods from higher order cities, export goods to lower order cities, and not interact with other cities of the same order. A limitation of this definition is that it is only useful as a way to determine the spatial structure of regions that house market-oriented (as opposed to labor- or input-oriented) firms.

A more popular approach among more recent theorists has been to define a region in terms of a spatially interdependent, or "nodal," labor market. According to Hoover and Giarratani (1985), nodal regions have two characteristics: (1) they are functionally integrated internally to the extent that labor, capital, or commodity flows are more common within the region than with another region, and (2) within the region, activities are oriented toward a single point, or node, where there is the presumption of dominance or order of the node over the surrounding peripheral area. Richardson (1979) extends the nodal concept to include polycentric regions that have several nodes and several peripheries but that exhibit high degrees of internal functional integration.

Karl Fox's "functional economic area" concept (Fox and Kumar 1994) is a variation on the nodal approach that is based on the view that the dominance of a central node over the surrounding periphery is attributable to the spatial dependence of workers on adjacent employment centers. This approach provides a conceptual basis for the delineation of *economic areas*, as defined by the United States Department of Commerce Bureau of Economic Analysis. For several practical and theoretical reasons, theorists have found Fox's functional economic area concept to be quite useful. First, since labor is the unit of measurement, there is a clear correspondence between regional analysis and social welfare analysis. If regions were defined in terms of geographic units that did not correspond to the location of the population, it would be difficult to determine the human impacts of changes within particular regions, especially if some regions had little or no population base. Second, unlike other definitions discussed later, the functional economic area concept explicitly incorporates space and spatial integration among economic units into the definition of a region. In the functional economic area definition, space is incorporated via worker transportation costs. Third, there is a clear economic rationale for the delineation of regions based on functionally integrated labor markets. Because workers desire to minimize transportation costs of commuting to work and employers wish to minimize the cost of compensating labor for high commutes, functional economic areas are more likely to correspond to the economic boundaries that firms and workers face in a spatial dimension. This allows regional analysts to examine regional problems in a manner similar to the way the problems are encountered by economic agents. Finally, large labor markets also serve as large consumer markets. Thus, a significant local labor market serves both as a resource for firms that employ local workers and as a consumer market for firms that wish to sell their products to workers. Relying on labor as the unit of analysis reinforces the patterns of interdependency among firms and workers in the region.

The problem with this approach to defining regions is that advances in communications and transportation technology have weakened many of the centripetal forces that tie suburban labor markets to central city business districts for employment needs. If telecommunications are a substitute for face-to-face communication, then workers can live in virtually any location and conduct economic activities from their homes. Similarly, if it is virtually costless to commute to work, due to improvements to the land-based transportation network or declines in the cost of airline travel, workers can live farther from their employers. When the bounds imposed by transportation costs are lifted, workers are

more likely to migrate to rural areas or commercial centers that offer service and/or quality-of-life benefits. The implications of these changes for the definition of a region are that regional boundaries become more difficult to define and may not represent the spatial dependencies between labor and employment centers.

Another limitation of the functional economic area concept and the related concept of a nodal economic region is that local political boundaries rarely correspond to functional economic areas or other nodal definitions, suggesting that there may rarely be a one-to-one correspondence between a particular regional problem and the tools that a planner may employ to resolve the problem. Similarly, since geographic or ecological boundaries rarely correspond to functional economic areas, planners may incorrectly estimate the ecological impacts of regional economic development using the functional economic area definition.

Alternative definitions of regions have been proposed to account for the shortcomings of the traditional functional economic area approach. The United States Census Bureau relies on estimates of commuting patterns to delineate metropolitan statistical areas that are similar to Fox and Kumar's (1994) functional economic areas but correspond to administrative boundaries (counties) rather than actual commuting areas. Regions have also been defined in terms of the degree of internal homogeneity with respect to some factor (Richardson 1979). This approach has been used by the United States Department of Commerce to define regions across the United States based on homogeneous groupings of contiguous states (Hoover and Giarratani 1985). Using the example of a region defined in terms of the size of a labor market, a regional boundary would emerge in places where differences appear in the characteristics of the labor force. Using income as an example, one could define low, medium, and high-income regions with relatively similar per capita incomes within regions and different per capita incomes across regions. Similarly, regions may be identified on the basis of the sectoral specialization of labor (e.g., manufacturing-based regions versus service sector regions). Using this approach, regions are treated much like homogeneous nations and can be analyzed using modified methods from international trade theory.

"Planning regions" that correspond to units of political or administrative control have also been proposed (Richardson 1979). The advantage of this approach is that political and administrative boundaries directly correspond to the boundaries over which planners and politicians design and implement policies. Its disadvantage is that economic and/or environmental regions rarely conform to political boundaries. Thus, in the case of an environmental region, a policy designed

for a particular political region may have spillover effects on adjacent environmental regions. Both the new institutional economics and the growth machine literature rely on this approach to define regions.

Regions may also be defined in terms of natural resource, ecosystem, or other geographic boundaries. A few authors suggest an interesting approach to defining regions in terms of the interdependencies between natural resource systems and human populations. Markusen (1987) defines a region as a "historically evolved, contiguous territorial society that possesses a physical environment, a socioeconomic, political, and cultural milieu, and a spatial structure distinct from other regions and from the other major territorial units, city and nation" (pp. 16-17). This definition recognizes that regions are historically determined entities that emerge largely due to the interaction between humans and local natural resources. Although improvements in transportation have removed many of the constraints imposed by geography, the historical patterns of regional formation still affect the evolution of modern regions. Cronon (1991) adopts a similar view and discusses the emergence of the Chicago metropolitan region as a historical pattern of interdependence between economic forces and the Chicago River and Lake Michigan.

For the purposes of this review, a region will be defined as a spatially contiguous population (of human beings) that is bound either by historical necessity or by choice to a particular geographic location. The dependence on location may arise from a shared attraction to local culture, local employment centers, local natural resources, or other location-specific amenities.

B. Conceptual Foundations of Regional Economic Development Theory

Regional development theory emerged from several different intellectual traditions. Neoclassical trade theory and growth theory provide the conceptual basis for understanding whether regional economies will become more similar or more differentiated over time. The spatial dimension of modern regional growth theory can be traced to several sources. Location theorists provide a framework for understanding the role of transportation costs in regional growth and decline. The literature on external scale economies that began with Marshall ([1890] 1961) has been rediscovered by more recent neoclassical theorists and those writing in the flexible specialization tradition. Finally, ideas from central place theory resurface throughout the regional development literature, especially in the growth pole literature and in many recent structuralist approaches.

1. THE INTERREGIONAL CONVERGENCE HYPOTHESIS

Most early theories of regional economic growth were aspatial extensions of neoclassical economic theories of international trade and national economic growth. Together, these early neoclassical theories predict that over time, differences in the price of labor and other factors across regions will diminish and tend toward convergence. This prediction has generated considerable controversy among theorists, particularly in light of the apparent tendency toward international divergence between the per capita incomes of industrialized nations and less developed nations. Early theories of regional economic development emerged out of this controversy and can be distinguished from one another in terms of differences in the theoretical predictions regarding interregional convergence or divergence in per capita incomes and factor prices over time. These theoretical responses are examined in more detail in the next section. First, it is important to look at the *interregional convergence hypothesis*.

Neoclassical trade theorists draw on the Heckscher-Ohlin-Samuelson (HOS) theorem to explain international factor price convergence using static equilibrium trade models. This well-known theory of international trade begins with the following simplifying assumptions (this discussion draws heavily on Salvatore 1998):

1. Two regions (1 and 2) trade two commodities (A and B) using two factors of production.
2. The production of A is labor-intensive, and the production of B is capital-intensive.
3. Both regions rely on the same technology in production and have the same production functions.
4. There are constant returns to scale in the production of A and B.
5. Both regions produce some of A and some of B.
6. Tastes are homogeneous across regions.
7. Commodity and factor markets are perfectly competitive.
8. Factors are mobile within nations but not mobile across nations.
9. There are zero transportation costs.
10. All resources are used up in the production of A and B.
11. Trade between 1 and 2 is balanced such that the value of regional exports is equal to the value of regional imports.

With these assumptions, Heckscher (1919) and Ohlin (1933) demonstrate that a factor-abundant region will have a comparative advantage in the production of goods that require the intensive use of that factor. This region will then specialize in and export the factor-abundant good and import goods for which factors of

production are scarce. This result can be explained as follows:

If the assumption is made that the markets for factors and commodities are perfectly competitive, the relative abundance of a factor in a given region can be expressed in terms of the ratio of prices for the two factors. Labor abundance, for example, can be expressed in terms of the ratio of wages to interest rates. If labor is relatively more plentiful in a given region, then this implies that the relative price of labor (wages) is lower, which further implies that the region will have a comparative advantage in the production of labor-intensive goods, because the production of labor-intensive goods is relatively cheaper for that region. If regions specialize in the production of goods for which relative factors are abundant and export those goods, importing goods for which factors are scarce, both regions gain from specialization and trade.

Samuelson (1953, 1949, 1948) elaborates on the Heckscher-Ohlin result to demonstrate how free trade and/or factor mobility equalizes the relative and absolute long-run prices of factors of production among regions involved in trade. Assume that region 1 specializes in the production of A, the labor-intensive good, whereas region 2 specializes in the production of B, the capital-intensive good. Once trade opens between the two nations and specialized production begins, the relative price of labor in the labor-abundant region rises due to relative increases in the demand for labor. Conversely, the relative price of capital rises in the capital-abundant region due to relative increases in the demand for capital. Even if capital and labor are immobile, the aggregate effect of these market forces is to equalize relative factor prices across regions. With factor mobility, less trade is required to equalize relative factor prices. Furthermore, with our assumptions of perfect competition, homogeneous production technologies, and constant returns to scale, trade also equalizes the absolute prices of labor and capital. In other words, real wages and real interest rates for similar types of labor and capital will be the same in both regions following trade and specialization (Salvatore 1998).

The HOS theorem is complementary to David Ricardo's theory of comparative advantage (1817) in that the Heckscher-Ohlin model explains why comparative advantages exist (differences in initial factor endowments), whereas Ricardo's theory only establishes why comparative advantages may lead to specialized production. The HOS theorem also has obvious implications for regional trade and development. In its simplest form, the model suggests that specialization in factor-abundant production combined with free interregional trade will result in equal per capita incomes across regions for workers with similar skills. This

hypothesis is a comparative statics version of the inter-regional convergence hypothesis.

Dynamic versions of the convergence hypothesis draw on neoclassical growth theory, particularly the models proposed by Solow (1956) and Swan (1956). In neoclassical growth theory, there are two different types of convergence. *Conditional convergence* refers to the convergence toward a steady state growth rate resulting in constant per capita incomes, consumption levels, and capital/labor ratios. This is termed *conditional*, because savings rates, depreciation rates, and population growth rates are allowed to differ across countries. Therefore, conditional convergence need not necessarily result in equal per capita income levels across countries. *Absolute convergence* occurs when growth model parameters are equal for all countries, which in turn implies that richer countries will grow slower than poorer countries, and per capita incomes will become equalized across countries over time as in the HOS model of international trade.

There are several reasons why it is important to distinguish between the convergence hypothesis of the HOS model and the convergence hypotheses from neoclassical growth theories. First, neoclassical growth models are, by definition, dynamic models, so their convergence hypotheses refer to the convergence in growth rates rather than the static convergence of factor prices. Although both models predict the eventual long-run convergence of per capita incomes across regions, the process that brings about convergence differs between the neoclassical trade and growth models. Since most neoclassical growth models typically assume away trade by modeling growth within closed economies, convergence occurs not through trade or factor mobility but through diminishing returns to capital investment. In neoclassical growth theory, regions with less capital per unit of labor will tend to have higher rates of return and higher initial growth rates than regions with high levels of capital per worker (Barro and Sala-i-Martin 1999). Although a regional version of the neoclassical exogenous growth model proposed by Borts and Stein (1964) considers interregional factor mobility, most neoclassical growth models assume perfect intraregional factor mobility but assume zero inter-regional factor mobility. Finally, neoclassical growth models often allow for differences in production technologies and/or savings rates across regions. If these parameters are assumed to be exogenous, then regions will only conditionally converge toward a steady state constant rate of growth. In neoclassical growth models that allow for variability in growth parameters, the steady state may differ across regions, but all regions eventually reach constant per capita income, consumption, and capital/labor ratio values.

The possibility of dynamic or static interregional convergence has obvious implications for regional development theory: trade and investment will eventually lead to an equalization of wages across regions. It is important to note, however, that this does not necessarily imply equalization of per capita incomes, since per capita incomes depend on additional factors such as the skill level of the population and the percentage of the population that is in the labor force. Thus, although the HOS model implies convergence in wages across countries, it does not necessarily imply convergence in per capita incomes, a point that is often ignored by critics of neoclassical trade theories. Also, since growth parameters may differ across countries, we may only observe the weaker form of conditional convergence over time, and per capita incomes may differ due to differences across regions in production technologies or savings rates.

2. LOCATION THEORY AND REGIONAL SCIENCE

Most current theories of regional economic development can be viewed largely in terms of their criticisms and response to the convergence hypothesis and neoclassical economics more generally. Location theory was developed as an early response to the ignorance of space in traditional economic analyses. Originally developed by Alfred Weber (1929) and later extended by Edgar Hoover (1937), Melvin Greenhut (1956), and Walter Isard (1956), location theory has focused primarily on developing formal mathematical models of the optimal location of industry given the costs of transporting raw materials and final products. Simply stated, firms will tend to locate near markets when the monetary weight (defined as the shipping costs per mile times the physical weight of the item shipped) of the final product exceeds the monetary weight of the inputs required to produce that product. Conversely, firms will tend to locate near primary input sources when the monetary weight of raw materials is large relative to the weight of the final product. Firms may also weigh the relative production cost savings from particular locations with the increased transportation costs to minimize the total costs of production and transportation.

Although location theory alone does not provide a theory of regional economic development, the explicit models of transportation costs have been highly influential in later theories of economic growth and development, particularly the new economic geography. Walter Isard (1956) eventually drew on concepts from location theory to develop the field now known as regional science, a branch of the social sciences that examines the impact of space on economic decision making. The analytic methodologies developed by Isard (1960) and

extended by Isard et al. (1998) have become standard items in the regional planning professional's toolbox.

3. EXTERNAL ECONOMIES

One problem with traditional Weberian location theory is that the cost advantages of spatial proximity to inputs and markets are modeled purely in terms of internal transportation cost economies. As economists since Marshall ([1890] 1961) have pointed out, industries may cluster together for reasons unrelated to internal cost considerations. Instead, firms may cluster to take advantage of external economies that result from close proximity to a large number of other firms. Following Hoover (1937), these external economies may include (1) *localization economies* that result from the firms in the same industry colocating in the same area and (2) *urbanization economies*, which result from the colocation of firms in different industries. Since these external benefits tend to increase with the number and output of colocating firms, they are usually referred to as *external scale economies* or *agglomeration economies*. Economists continue to disagree over the nature and cause of these external economies, but broadly speaking, knowledge spillovers, labor pooling, and economies in the production of intermediate inputs have all been cited as contributing factors. Because external scale economies are characterized by both positive externality effects and increasing returns to scale, traditional competitive market models have tended to ignore these effects.

4. MODELS OF SPATIAL COMPETITION

Another benefit of spatial proximity from a firm's perspective is the ability to charge higher prices to customers that are located within close proximity of a given distribution point. This observation, first explored by Harold Hotelling (1929), has produced a considerable literature on the role of space as it affects the pricing behavior of firms. The essence of Hotelling's argument is that spatial proximity gives firms market power, because nearby customers would be willing to pay more for goods that can be consumed without incurring substantial transportation costs. In the simplest case with two firms competing along a straight line, monopolistic competition in space produces a tendency toward concentration with firms splitting the market along the line segment. This optimum location is not socially efficient, however, since customers at either end of the line must incur higher transportation costs. Works by Devletoglou (1965), Eaton and Lipsey (1978), and many others extend Hotelling's original model to incorporate the threat of entry by competitors, demand elasticity, and competition along a plane. These extended models demonstrate that concentration

is not always the equilibrium outcome and that the threat of entry may or may not always drive profits to zero.

5. CENTRAL PLACE THEORY

An early attempt to bring some of these perspectives together in a more general theory of the spatial location of firms can be found in the work of Christaller (1933) and Losch (1954). Christaller first formulated *central place theory*, as it came to be called, to describe the distribution of cities of different sizes within southern Germany. Losch expands on the initial ideas of Christaller and places them into an economic context, introducing the idea of a *demand cone* into the hexagonal market area framework developed by Christaller. The basic idea elaborated by Losch is that the relative size of a firm's market area, defined as the territory over which it sells its product, is determined by the combined influence of scale economies and transportation costs to markets. If scale economies are strong relative to transportation costs, all production will take place in a single plant. If transportation costs are large relative to scale economies, firms will be scattered around the region. For any given market, free entry among firms drives profits to zero and causes all spaces to be occupied by equally spaced firms with hexagonal market areas. However, due to differences in transportation costs, scale economies, and demand for different products, the size of the individual hexagons will be different for different markets. *Central places* emerge in locations where market areas for different products overlap. As indicated in the previous section, this process of monopolistic competition in space produces a hierarchically structured system of cities of different sizes and different levels of product diversity.

Although location theory and central place theory have each contributed considerably to our understanding of the spatial pattern of firms, their static perspective and ignorance of many important dimensions of regional economic growth, particularly labor migration, has impaired their use as a general theory of regional economic development. Theories of regional economic development incorporate these concepts into more formal expressions of regional growth dynamics.

C. Alternative Theories of Regional Economic Development

According to the interregional convergence hypothesis, interregional trade and regional investment should eventually lead to the equalization of wages across regions and the equalization of per capita incomes across regions with equal labor participation rates, skill levels, and investment levels. The first two sets of theories examined in this section can be defined in terms of their stance on the interregional conver-

gence hypothesis discussed above. Following these two theoretical perspectives are several alternative perspectives that view regional growth and decline as resulting from underlying structural changes in the organization of industry and the political-economic system. The final section examines two new perspectives from neoclassical economics that incorporate many earlier criticisms into new theoretical approaches. The final subsection examines the common themes among all of these theories.

1. THEORIES OF REGIONAL ECONOMIC CONVERGENCE

a) Export Base Theory

Among all theories discussed in this review, few have been as influential as the export base model developed in the 1950s by Charles Tiebout (1956a, 1956b) and Douglass North (1956, 1955). North (1955) argues that regional growth in local political, economic, and social institutions is largely determined by the region's response to exogenous world demand. This response produces growth in both the economic base, or export sector, and the "residential," or nonbasic, sector, which exists only to serve the basic sector. Furthermore, North points out that regions need not necessarily industrialize to grow, since a region's exports may consist of either manufactured goods, service-based goods, or agricultural goods.

As regions grow, their economy becomes more diversified, due to increases in local production to serve increasing local per capita incomes and the emergence of new industries serving export markets. Over time, regions will tend to "lose their identity as regions" (North 1955, 258). With the increasing diversity of regional export bases and the mobility of factors of production, production will tend to disperse across regions over time, and per capita incomes will tend toward interregional convergence as in the HOS model of international trade.

In a debate between Douglass North and Charles Tiebout in the *Journal of Political Economy*, the modern version of the theory came into fruition. Tiebout (1956a) argues that North's model ignores the importance of many important supply-side factors that ultimately affect a region's ability to support an emerging export base. He also criticizes North's article (1955) by pointing to other instances when exports are not the sole determinants of regional economic growth. For example, in regions with populations large enough to affect the worldwide demand for exports, regional growth in per capita incomes may be affected by an increase in export demand and may affect world demand for exports. This bidirectional causality implies that there are significant feedback effects between regional per capita income growth and export market demand. North (1956) replies to Tiebout's criticisms by pointing

out that the model should be viewed as a long-run model of economic growth that may not always be applicable in the short run when certain factors of production are fixed and immobile. In the long run, however, the model still holds as an adequate account of regional economic growth. In a final rejoinder (1956b), Tiebout reiterates that the export base concept is merely an oversimplified version of more sophisticated general equilibrium national per capita income models. Furthermore, the "stages" theory of economic growth criticized by North is not necessarily wrong, according to Tiebout. Instead, it is only applicable for a more limited number of cases.

b) Neoclassical Exogenous Growth Theory

The mainstream neoclassical economic view of regional economic growth draws heavily on the literature of national economic growth developed by Roy F. Harrod (1939) and Evsey D. Domar (1946). In contrast to the demand-side approach of export base theory, neoclassical growth theory models regional growth using supply-side models of investment in regional productive capacity. Early versions of this theory are often referred to as *exogenous* growth theory, because savings rates, population growth rates, and technological progress parameters are all determined outside the model. The models developed by Solow (1956) and Swan (1956) have been the most influential in modern growth theory, primarily due to the more general form of the regional production function, which allows for substitutability among production inputs in accordance with production functions that assume constant returns to scale and a positive elasticity of substitution among inputs (Barro and Sala-i-Martin 1999). These features generate predictions of *conditional convergence* of growth rates over time across countries and the leveling off of per capita incomes within countries. If growth parameter values are the same across countries, then neoclassical exogenous growth theory also predicts absolute convergence in per capita incomes, as discussed in the previous section.

Borts and Stein (1964) modify the neoclassical growth model for the regional context by allowing for open regional economies with net exogenous labor and capital inflows. Barro and Sala-i-Martin (1999) argue that interregional convergence is more likely than international convergence, because factors of production are more highly mobile across regions. Furthermore, *absolute convergence* in per capita incomes across regions within a country is more likely due to the homogeneity of savings rates, depreciation rates, population growth rates, and production functions within countries.

Williamson (1965) modifies the Borts and Stein (1964) argument somewhat by suggesting several rea-

sons why interregional convergence may be more likely during the later stages of a nation's development. First, labor migration rates in relatively underdeveloped nations are unequal due to differences in the costs of migration and differences in the way migrant workers are perceived vis-à-vis indigenous workers. Second, initial endowments or constraints, external economies of scale, and immature capital markets in some regions may impede equal capital flows across regions. Third, central government policies may be biased toward regions that are more politically mobilized or where economic growth creates the need for additional capital investments. Finally, there may be few interregional linkages in the early stages of national growth.

2. THEORIES OF REGIONAL ECONOMIC DIVERGENCE

The concept of convergence, even in its weaker formulation as long-run constant per capita income growth rates, or conditional convergence, has come under attack from many sides. One criticism is largely empirical. The field of development economics emerged in the post-World War II period in recognition of the growing economic disparities between industrialized nations and less developed countries (LDCs). Although empirical studies (Perloff et al. 1960; Williamson 1965) supported a trend toward economic convergence at the regional scale, at least in the United States, critics pointed to the persistent poverty in most LDCs as evidence that some regions of the world were not conforming to the predictions of the neoclassical growth models.

Another criticism focuses on the unrealistic assumptions underlying neoclassical growth theories, particularly those having to do with the assumption of constant returns to scale, zero transportation costs, identical production technologies across regions, perfectly competitive markets, identical preferences across regions, and the assumption of homogeneous labor and capital inputs. Although there have been attempts to incorporate more realistic assumptions into extant models of exogenous growth, most neoclassical theories still tend to generate predictions of conditional convergence even when labor or capital is heterogeneous across space (Barro and Sala-i-Martin 1999).

One response to the convergence critique has been to directly incorporate a prediction of divergence into extant theories of regional economic growth. Here two such theories are examined: cumulative causation theory and growth pole theory.

a) Cumulative Causation Theory

Gunnar Myrdal (1957) argues that increasing returns to scale produces clustering of economic activity within those regions that are first to industrialize. Moreover,

the process of growth tends to feed on itself through a process of *cumulative causation*. Although underdeveloped regions offer the advantage of low-wage labor, these benefits tend to be offset by the agglomeration economies found in the industrialized regions.

Myrdal (1957) argues that underdeveloped regions may benefit from growth in developed regions through "spread" effects resulting from the diffusion of innovations into a "lagging" region and the growing export markets for lagging region products. However, these benefits will tend to be offset by the "backwash" effects resulting from the flow of capital and labor from the lagging region into the developed region. Free trade results among regions only serve to reinforce this process of cumulative causation by further catalyzing growth in developed regions at the expense of lagging regions.

Kaldor (1970) elaborates on and expands Myrdal's theory of cumulative causation by introducing ideas from export base theory and the concept of an *efficiency wage*. Like Myrdal's model, Kaldor assumes that increasing returns to scale give early industrializing regions the advantage in international trade. Cumulative causation sets in when an exogenous shock increases the worldwide demand for an industrial good. Actual monetary wages may be the same in all regions, but efficiency wages, defined as monetary wages divided by a measure of labor productivity, tend to be lower in industrialized regions due to scale economies. Since regions with lower efficiency wages can produce more output, which in turn leads to further reductions in the efficiency wage (and so on), growth may build on itself without bound.

While the Myrdal-Kaldor cumulative causation approach is usually taken to imply an outcome of divergence, Dixon and Thirlwall (1975) formalize Myrdal's model and demonstrate that cumulative causation does not necessarily predict interregional divergence given reasonable model parameter values. Instead, the model more likely predicts "constant regional growth differences sustained by the Verdoorn effect" (Dixon and Thirlwall 1975, 203). The Verdoorn effect refers to the fact that growth in labor productivity is partly dependent on the growth of output. Dixon and Thirlwall demonstrate that this effect, which is central to the cumulative causation theory, can be a source of regional growth rate differences only when the Verdoorn coefficient varies between regions or when there are differences in other model parameters that are also affected by the Verdoorn coefficient.

b) Growth Pole Theory

The growth pole theory of regional economic growth places Myrdal's theory of cumulative causation into a

spatial context. Perroux's (1950) "space as force" view of spatial interaction, which defines space as a type of network that is held together by centripetal forces, has formed the basis of most growth pole theories. Although this view of space is not unlike that which is advocated by those in the flexible specialization/network theory tradition, the two theoretical perspectives have largely developed in isolation from one another.

In Perroux's (1950) original formulation, a growth pole referred to linkages between firms and industries. "Propulsive firms" are those that are large relative to other firms and generate induced growth through interindustry linkages as the industry expands its output. Hirschman (1958) argues similarly in his discussion of backward and forward linkages between firms. Boudeville (1966) is credited for placing Perroux's formulation into geographic space. For Boudeville, a growth pole is defined in terms of the presence of propulsive firms and industries that generate sustained regional growth through linkages with other firms in a region.

Hirschman (1958) discusses how polarized development may benefit both the growing region and the surrounding hinterland. Like Myrdal's "spread" and "backwash" effects, Hirschman argues that growth in a developed region produces favorable "trickling-down" effects within a lagging region as the lagging region's goods are purchased and labor hired by the developed region. Growth may also produce unfavorable "polarization" effects resulting from competition and trade barriers erected by the developed region. Despite these similarities, Hirschman rejects Myrdal's cumulative causation approach as overly bleak due to the fact that it hides "the emergence of strong forces making for a turning point once the movement towards North-South polarization within a country has proceeded for some time" (p. 187, n. 5a). In the end, Hirschman has faith that trickle-down effects will outweigh polarization effects due to increased pressure to enact economic policies to combat the latter.

A related perspective is Friedmann's (1966) center-periphery model, which includes elements of Myrdal's theory of unbalanced regional growth and export base theory. Like export base theory, Friedmann recognizes that growth may be externally induced. He also points to the impact of interregional labor migration on the convergence of incomes across regions. However, Friedmann departs from traditional export-based theories of economic growth by pointing out that local political and economic entrepreneurship and leadership may affect the translation of export demand into growth in the nonbasic residential sector. The quality of local leadership is in turn affected by the region's development history. Friedmann also points out that

regions may vary in the extent to which supply constraints limit a region's ability to respond to increased demand for exports. Finally, large urban areas have the initial advantage in the competition for new growth because of the decreasing cost benefits of urbanization economies. All these factors tend to work to the advantage of core regions, which are incumbents in the economic development game. Outside of the core, regions are differentiated by their relative degree of regional economic autonomy. "Resource frontiers" are undeveloped regions whose primary draw is the plentiful supply of untapped natural resources. "Downward-transitional areas" are rural areas trapped in a stage of structural poverty, primarily due to their structural dependence on adjacent core regions.

Growth pole theory was largely abandoned in the 1980s due to growing dissatisfaction with the perceived lack of coherence between traditional notions of growth poles and empirical reality. Many growth pole policies were shown to fail in their intended objectives of inducing new economic growth in lagging regions. Other criticisms also emerged, such as the inappropriate use of input-output analyses to examine the spatial interactions between firms, the difficulties of translating Perroux's original abstract formulation into useful theories of regional economic development, the lack of emphasis on the process of structural change within growth poles over time, the weak behavioral basis of the theory, and the lack of explanation within the theory about why some growth poles tend to grow faster than others (Darwent 1969; Higgins 1983; Thomas 1972; Hermansen 1972).

3. STRUCTURALIST THEORIES

Another body of theory examines regional economic development as a process of structural adjustment both within and outside the region. Rather than view regional economic growth in terms of the factors pushing regional economies toward or away from some equilibrium rate or distribution of growth, these theorists view economic growth as a path-dependent evolution through various stages of economic maturity.

a) Stage/Sector Theories

Early perspectives in the structuralist tradition include several different "stage" theories of regional economic growth. Since many of these theories also include a focus on sectoral change, some are also referred to as "sector" theories (Perloff et al. 1960). Hoover and Fisher (1949) present an early theory of sectoral change through various stages of regional growth. In the early stages of regional growth, agricultural production predominates and the economy is largely self-sufficient. As transportation improves, producers begin

to specialize and engage in outside trade with other regions. As diminishing returns begin to occur in the production of the region's primary extractive and agricultural industries, the region enters a phase of industrialization. At the most advanced stage, the region specializes in export production. In this theory, the progression from self-sufficiency to export producer is largely seen in terms of the internal changes in the division of labor that produce economic specialization.

Other early stage theories developed to explain national economic growth have also been used to explain regional economic growth and development. Schumpeter (1934), like Hoover and Fisher, sees economic development as occurring from within the region. Regional economic change can be viewed as a progression through long waves of growth and decline that are distinguished from one another through the differences in the nature of the innovations that characterize each period. New innovations emerge through a process of "creative destruction," where old ideas are constantly replaced by new ones. Rostow (1977, 1956) provides a related view in his description of a "take-off" period, where a rapid revolution in the means of production leads to a relatively long-term wave of sustained growth.

Thompson (1968) presents another stage theory of urban/regional economic growth. According to Thompson, urban areas grow by progressing from an early stage where the local economy is largely equated with a single large industry or firm through various phases of export-led growth until the export of services becomes the major function in the final stage. At some point during this development process, a "ratchet" effect occurs, where growth patterns become locked into place and future contraction becomes unlikely. Thompson gives several possible explanations for this effect:

1. In diverse urban economies, small firms have multiple local linkages that are difficult to reproduce if the firms relocated to another region.
2. Cities with larger populations are more successful in garnishing political spoils from state and national government entities.
3. Per capita public service costs are significantly lower due to economies of scale.
4. A large local population base is valuable as a labor resource and a potential consumer market for locally oriented industries.
5. Large areas give birth to more local industries than small areas, which in turn increases the probability of local innovations.

Thompson concludes by pointing out that diseconomies of scale associated with congestion and bureaucratic costs may set in to counter the ratchet effect.

Pred (1977) discusses how the structure of information flows between economic agents affects the economic development of city systems. A central premise of the work is that "spatial biases" in the flow of information tend to give incumbent urban centers an advantage in economic growth. Furthermore, the flow of information across the landscape occurs primarily among the system of large metropolitan centers, thus reinforcing the stability of the system of cities. Pred relies on this basic idea to account for the historical development of urban areas. During the "pretelegraphic" period of urbanization, when urban centers emerged primarily to facilitate trade, the spatial bias was most pronounced due to the importance of face-to-face communication within cities and among large trading centers. Due to spatial biases, trading centers established in the pretelegraphic centers were more likely to become the sites of initial industrialization. Once established, multiplier effects gave these initial industrial centers a cumulative advantage in economic growth as innovations in production technologies diffused among local factory owners. During the postindustrial period, "multilocal" corporations emerged to transform cities. Unlike growth pole theorists, Pred concludes that the inter- and intraorganizational linkages between the administrative hubs found in large metropolitan areas are self-reinforcing and not likely to result in a "spread" of growth into lower-level urban centers or surrounding hinterlands (p. 122).

Henderson (1974) provides an interesting look at how changes in industry structure lead to different city size distributions. Essentially, Henderson argues that the relationship between the utility of any given city resident and city size can be represented by an inverted U, which captures external economies of scale on the left side and diseconomies of scale on the right. The link between this argument and industry structure is the twist that whereas diseconomies are predominantly associated with population size, external economies are industry specific. Thus, it only makes sense to group firms that share the same external economies within the same city. This suggests that the optimal size of any given city over time will depend on its role, which is a function of the industry structure that dominates the city.

b) Profit/Product Cycle Theories

Vernon's (1966) *product cycle* approach views regional development and change in terms of the evolution of regional industry structures required to sell export goods. Due to low price elasticity of demand for new products, an innovating firm cares less about small initial cost differences between regions than about

future cost considerations. Furthermore, in the early stages of a product's life, locational proximity to suppliers and research and development firms is important to facilitate the flexible incorporation of product changes and process innovations. Thus, large urban areas will be preferred locations for firms producing new immature products. As the product matures and becomes more standardized, the need for flexibility diminishes, and the need to focus on economies of scale increases. Once production has been standardized, the firm can employ cheap low-skilled labor, so underdeveloped regions become preferred locations. Weinstein et al. (1985) rely on this perspective to explain patterns of regional development in the United States.

Taylor (1986) provides several criticisms of this approach:

1. The model provides an ambiguous treatment of the internationalization of production and the ownership dimensions of internationalization.
2. The model is at odds with more conventional incremental views of product invention and innovation.
3. The model ignores product differentiation.
4. The assumption of shifts to low-cost labor locations in the final stage of the product cycle implicitly assumes that cheap labor is the primary cost consideration, an assumption that is not always true.
5. The model assumes a homogeneous geographic plane on which firms compete.
6. Market cycles may not always be consistent with international product cycles.

Markusen's (1985) *profit cycle theory* is one modification of the product cycle approach that responds to several of Taylor's (1986) criticisms by incorporating a focus on industry structure at various stages of a product's history. According to Markusen, sectoral change within regions corresponds to one of five "profit cycles" that are determined by the structure of competition at various stages of product development. Initially, sectoral development precedes from a period of zero profit toward a period of superprofits, where initial innovators earn monopoly profits. The sector then enters a normal profit stage as new firms enter the market. Eventually, the market becomes saturated, and destabilizing factors set in. During this phase, firms either tend toward oligopolistic forms of organization to gain additional profits or the firms enter a stage of decline, as substitute or imported products take over the market. The final "negative profit" stage is one of sectoral decline and disinvestment.

Each stage in Markusen's (1985) profit cycle is characterized by unique spatial relationships. In the initial stages of a product's life, the location of firms is largely

determined by historical accident or by the physical location of the innovation. Entrants into the market may be drawn to the location of the initial innovation or to regions whose resources are favorable to the industry. During the "superprofit" stage, industries collocate to benefit from knowledge spillovers and a localized skilled labor force. Eventually, firms grow in size, diminish in number, and become increasingly oriented toward the location of consumer markets. If the industry tends toward an oligopolistic structure, firms will tend to concentrate to take advantage of market power resulting from proximity to consumer markets and location-oriented political supports. During later periods, oligopolies seeking to minimize labor costs may relocate to escape unionization. If firms enter a final stage of decline, the spatial tendency will be one of divestiture and gradual abandonment of location-specific facilities.

c) Industrial Restructuring Theories

Several new empirical realities began to emerge in the late 1970s and early 1980s that led to the emergence of new structural explanations of regional growth and development. Among these trends have been the decline of manufacturing and the emergence of the service sector in the industrialized world, the increasing international mobility of capital and labor flows, and the growing interregional disparities in labor conditions across gender and ethnic lines. These and other studies in the literature suggest that fundamental shifts in the organization of industry and labor have resulted in a "deskilling" of the labor force (Harrison 1985), a relative decline in the proportion of workers earning middle-income wages (Leigh 1994), and a spatial stratification of the workforce (Massey 1984).

One response among regional development theorists was to look for explanations for these trends within the changes that were occurring in industrial organization. The "industrial restructuring" perspective examines how structural changes in the organization of industry have affected regional capital and labor markets.

Several studies in this tradition point to the internationalization and mobility of capitalist production and its effect on workers. According to Sassen (1988), direct foreign investment has disrupted traditional labor structures. In the developing world, frequent layoffs resulting from insecure manufacturing jobs have created a large supply of female migrant workers, many of whom were previously employed in the nonwage household sector. In the United States, the internationalization of capital flows resulted in the disinvestment in many U.S. industries. This disinvestment in national

productive capacity has in turn resulted in the destruction of social and community ties in many regions of the United States (Bluestone and Harrison 1982).

Massey and Meegan (1982) examine of the geography of employment decline and how firms use job elimination as a corporate strategy. The authors begin by examining three different corporate strategies that typically lead to job loss. *Intensification* strategies seek to improve labor productivity without substantial new investments. *Investment and technological change* strategies result in changes to productive technology. *Rationalization* strategies are those focused on the simple reduction of labor capacity. Since each of these strategies may lead to differences in the number of plant closures and investments in new capacity, the authors argue that regions are affected in different ways depending on the nature of the strategy leading to employment decline.

Another trend has been the transformation from a manufacturing-based to a service-based economy among advanced industrialized nations. Noyelle and Stanback (1983) attribute the rise of the service sector to the increased geographic size of markets, innovations in transportation technology, the increased importance of public and nonprofit sectors, and the rise of the multinational corporation (p. 3). Their empirical study focuses on the structural changes resulting from these forces acting on U.S. metropolitan areas. Regarding regional development, the authors argue that the transformation to a service-based economy has fostered increased centralization among corporate activities accompanied by the decentralization of many low-skilled white-collar jobs. The authors also point out that many older regions within the Snowbelt have managed to stave off decline following the loss of manufacturing jobs with concomitant growth in corporate activities and government-sector jobs.

Storper and Walker (1984) explore the importance of labor to the location decisions of industries. Labor, unlike other factors of production, is inherently heterogeneous across space due to differences in culture, social institutions, and production requirements across that same space. Furthermore, unlike other commodities, labor is not purchased outright. Instead, it is bought and sold subject to uncertain expectations about future performance and reproducibility. Firms respond to and take advantage of the spatial heterogeneity of the labor force as a way to exert control over their workers. For example, firms can easily escape unionization by relocating to another region. Similarly, firms can exploit the spatial relationships between workers within individual plants to reduce the tendency toward worker solidarity. Workers, on the other hand, may also take advantage of the mutual dependency between the firm

and the worker and successfully capture concessions if their skills are sufficiently scarce outside the region.

Danson (1982) argues that the emergence of a "dualist" industrial structure has been a primary cause of the stratification and segmentation of the labor market. The author begins by discussing the emergence of the recent period of "monopoly capitalism," where large core firms embedded in oligopolies have come to dominate smaller competitively structured periphery firms. The labor market is in turn differentiated based on skill level and is largely confined to distinct segments based on internal linkages to specific firms, trade groups, or industries. Jobs within different skill strata or industry segments often are also highly differentiated in terms of worker benefits and wages. The remainder of the article discusses how the emergence of peripheral firms in many inner cities and regions has led to the relative decline of those locations relative to the locations housing core firms.

d) Flexible Specialization and Network Theory

Another theoretical response to these recent changes in the structure of industry has been the development of a new theoretical approach that focuses on the patterns of interrelationships found in new industrial districts. Piore and Sabel (1984) discuss how increasing social unrest, floating exchange rates, oil shocks, the international debt crisis, the saturation of industrial markets, and the diversification of consumer demands have produced a new form of production designed to permanently respond to change through innovation. This new "flexible specialization" is based on the use of flexible labor and capital that can easily be tailored to the needs of changing markets. Firms engaged in flexible specialization are bound together through highly localized networks where knowledge and information are shared. These networks are bound by trust rather than hierarchical authority relationships found in vertically integrated forms of organization. Piore and Sabel point to the Marshallian industrial districts of Italy as one example of flexible specialization in action.

Saxenian (1994) attributes Silicon Valley's success in the high-tech industry to its adoption of a network form of industrial structure. She observes that although Route 128 in Boston and Silicon Valley, California, were both high-tech centers in electronics during the 1970s, only Silicon Valley emerged from a regional recession in the 1980s to become an international leader in the high-tech industry. Her work examines the causes of these divergent growth trajectories and concludes that the differences have been primarily attributable to differences in the nature of industry structure within the two regions. Silicon Valley's industry was defined by dense

social networks based on flexible specialization and entrepreneurship. In contrast, Route 128 was dominated by a small number of hierarchically integrated firms that valued secrecy and independence.

Porter (1990) discusses how geographic clustering can be viewed as an organizing force for national industrial competitiveness. Domestic rivalry combined with discriminating local demand helps to prepare firms for global markets. Geographic concentration magnifies the impact of domestic rivalry, and local discriminating demand serves as a catalyst for innovation. Geographic concentration also helps to spur local investment in specialized infrastructure and other local factors, especially by governmental and educational institutions that depend on the health of a local industrial cluster. Finally, geographic clusters facilitate intralocal information flows and help to spread ideas and innovations especially when firms share similar local business cultures, interact in local business organizations, and share similar local or national norms and values.

In chapter 10 of his book, Porter (1990) expands on his theory to define different stages of competitive development. In the factor-driven stage, internationally successful industries draw advantages from basic production factors. Eventually, nations may enter an investment-driven stage, where firms and the national government invest locally to transform local basic factors into more advanced factors of production, eventually reaching the innovation-driven stage of national development, when all determinants of competition are working at their strongest. The final wealth-driven stage is the beginning of a period of decline, caused by a reduction in the number of successful rivals and a trend toward capital preservation rather than capital accumulation (p. 557).

What features of these new industrial districts and networks contribute to the superior performance of these industry structures in adapting to change? According to Scott (1992) and Cooke and Morgan (1993), networks offer the control advantages of hierarchical forms of transaction governance while maintaining the flexibility advantages of markets. Networks rely on locational proximity to reinforce trust relationships between those involved in economic exchange. The key features of a networked region are strong public and private industrial support institutions, channels for the rapid diffusion of technology, a high degree of interfirm interactions, and a critical mass of innovation-focused firms (Cooke and Morgan 1993, 562).

One criticism of the network-flexible specialization school is that theorists in this tradition tend to oversimplify network relationships and ignore fundamental structural relationships within and outside regional

networks. Many also fail to acknowledge differences across networks in the structure of competitive relationships among firms. For example, Porter places much more emphasis on the importance of local competition among similar firms in the same industry. Others in the network tradition place less emphasis on local competition and focus instead on the collective sharing of knowledge and information among local firms.

Markusen et al. (1999) add additional complexity into the common conception of the flexibly specialized industrial district by emphasizing the role of large firms, state actors, local fixed capital, and the active recruitment of skilled labor in district formation. The authors also point to the importance of both local and global "embeddedness" within key intraregional and interregional economic and political relationships. In their analysis of fifteen "second-tier" cities, the authors identify four distinct types: (1) the traditional Marshallian industrial district based on small-firm craft-based production; (2) the hub-and-spoke structure where suppliers are coagglomerated around one or a few core firms; (3) state-anchored districts, where a governmental or nonprofit entity predominates; and (4) satellite industrial platforms, where branch facilities of large, externally owned firms locate.

e) Marxist Theory

Another response to the new structural changes in the international economy, especially the persistent underdevelopment of regions in the third world, was the emergence of a Marxist perspective on regional growth and decline. Marxists theories of uneven growth and spatial differentiation place the roots of the uneven development crisis squarely within the nature of the capitalist system. In contrast to theories in the convergence-divergence debate, authors in this literature argue that neither perspective is correct. In fact, as Martin and Sunley (1998) observe in their review of this literature, the Marxist perspective regards regional growth and decline as neither convergent nor divergent but "episodic." In other words, capitalist accumulation proceeds through lumpy progressions, spurred forward by specific crises, which in turn force capitalists to search for new spatial modes of production.

According to David Gordon (1971), the Marxist perspective examines urban and regional economic change as resulting from the historical evolution in a society's dominant mode of economic production. Social change and development are viewed in terms of the inherent conflicts between the capitalist class and the worker class. Castells (1972) argues that the modern problem of underdevelopment can only be understood in terms of the historical development of the capitalist mode of

production. Current trends of underdevelopment reflect the exploitation of particular regions by previously developed capitalist regions, through colonial domination, commercial domination, or imperialist industrial and financial domination (p. 44). Castells argues that we can only understand this process by looking at the history of political and social relations within a region and the particular type of dependency relationship that has emerged within the region. Harvey (1985) recognizes that although there is always a tendency toward "balanced growth" that is caused by competition for profits, this state can never be achieved due to the unbalanced structure of social relations (p. 11). This instability results in periodic crises in capitalist accumulation and subsequent controlled waves of investment and disinvestment.

Neil Smith (1984) defines uneven development as the "geographic expression of the contradictions of capital" (p. 152). Smith draws heavily on Harvey's work to develop a view of urban development that is based on the seesaw process of investment and disinvestment at different spatial scales. The most pronounced scale is the urban environment, whose rent value is manipulated, according to Smith, to ensure capitalist accumulation. In contrast to the neoclassical economic view, which sees development as progressing toward equalization, Smith sees this tendency as an inherent paradox in capitalism that does not produce even patterns of development but instead produces seesawing waves of development and underdevelopment. Urban areas are initially developed to accumulate profits. However, due to the spatial fixity of the investments and the increased competition from new entrants, these profits are unstable. Once profits begin to fall, areas are completely abandoned for new locations in the search for new profits.

Works in the Marxist tradition also focus on the spatial dimension of the division of labor. Massey (1984) argues that distance and spatial differentiation are strategic devices employed by capitalists to facilitate capital accumulation. The use of spatial strategies to take advantage of the differentiation of the labor force results in patterns of uneven development across regions. For example, the separation between headquarters and branch plants may result in substantial leakage of profits from the branch region to the region housing the firm's headquarters. The branch region may also experience relatively weaker regional multiplier effects and regional purchases.

Holland (1976) argues that the trend toward regional inequality results primarily from the tendencies toward concentration among large-scale capitalist industries, which leads to the geographic displacement of labor in both the manufacturing and the agricultural sectors.

This surplus of labor, which Marx refers to as the "industrial reserve army," serves to impose discipline on existing wage workers by reducing the company's dependence on location-specific labor. Goodman (1979) makes a similar argument in his discussion of the phenomenon of "regional rotation." Here, he argues that recent trends in business location within U.S. regions resemble a pattern similar to crop rotation. By threatening to relocate to other regions, businesses have created more favorable conditions for themselves.

Watkins and Perry (1977) rely on a Marxist perspective to explain the emergence of the Sunbelt cities in the southern United States. The authors begin with a critique of neoclassical convergence perspectives on regional growth, claiming that "rather than convergence, a more apt analogy can be drawn by considering two trains headed in opposite directions" (p. 22). Although the Sunbelt and the declining northern U.S. cities may seem to be headed toward a convergent future, once the regions cross paths, they will progress toward separate destinies. The authors argue that a process of cumulative causation is more likely to be driving regional growth than a general tendency toward factor price equalization. Cumulative causation is not the only force at work in the Sunbelt, however, because this region was once a lagging region in apparent decline relative to the North. The theory of cumulative causation can account for the emergence and dominance of one region over another, but it cannot explain why some regions switch roles from a dominant to a dominated status.

To account for this switch, Watkins and Perry (1977) rely on the Marxist perspective. Emergent cities grow by enacting barriers that limit the growth of smaller cities, thereby facilitating capital accumulation. However, as industrial structure evolves from one epoch to another, the barriers erected by growing capitalist cities become inflexible and may act to repel new emergent industries that no longer benefit from the barriers erected during previous epochs. For example, in the United States, the erection of substantial waterway and rail transportation infrastructure in the nineteenth century served to drive commerce toward emergent urban market areas. With the onset of the industrial revolution, new cities appeared in the Midwest, and older mercantilist cities became trapped by their preindustrial ways of doing business. In the next wave of urbanization, federal investments in infrastructure and military-industrial complexes helped to spur the disproportionate growth of Sunbelt cities, which were then unencumbered by substantial fixed investments or patterns of capital accumulation.

Markusen (1987) combines the Marxist approach with a variety of other regionalist approaches to discuss

how the uneven spread of capitalism in the United States has produced economic differentiation at the regional level, which has given rise to unique patterns of regional political conflict. These regional conflicts have in turn been reinforced by the U.S. federal system of government. Markusen argues that regional politics may foster a region's integration into the larger capitalist system, or it may foster a divergent path.

4. POLITICAL INSTITUTIONS AND REGIONAL ECONOMIC DEVELOPMENT

Aside from the works of Markusen and a few Marxist theories discussed above, few theories account for the role of politics and political institutions in economic development. Since local politicians and planners directly attempt to influence the rate of growth and the location of industry through mixes of tax incentives, land use regulations, and infrastructure provision policies, ignoring this dimension is seen as a substantial weakness of existing theory. Here, two perspectives on the role of politics in regional economic development are reviewed: *growth machine theory* and the *new institutional economics*.

a) Growth Machine Theory

Molotch (1976) argues that regional growth is a unifying imperative among local political and economic elites. In this theory, the impetus to pursue a strategy of regional growth comes not from structural economic forces or from the equilibrating tendencies created by exports and trade. Instead, it comes from political coalitions of land-based elites who stand to benefit from local economic development (Wolman 1996). Since this perspective treats regional growth largely as the cause of local political organization rather than the reverse, it is more accurately seen as a theory of local politics; however, if one assumes that growth machine policies are effective, then they should have an impact on the location economic activity.

Logan et al. (1999) provide an overview of recent developments in the growth machine literature. This review is particularly useful, because it links growth machines to economic outcomes. If the growth machine perspective is to be a useful contribution to the theory of regional economic development, then growth machines must have an impact on the interregional distribution of economic activities. The authors conclude that although the impact of pro-growth policies is mixed, growth-control policies do not seem to significantly affect population growth rates. This suggests that the growth machine perspective may be a more useful theory of why political coalitions form than a theory of how growth coalitions affect regional economic outcomes.

b) The New Institutional Economics

The new institutional economics is an attempt to incorporate institutions and institutional change into theories of economic development. A seminal work in the new institutional economics is the work of Ronald Coase (1937). Coase argues that various forms of internal economic organization can be traced to the desire among owners to minimize the transaction costs of production. For transactions that involve substantial uncertainties and for which contractual monitoring costs are prohibitively high, vertically integrated nonmarket institutions may have cost savings over market forms of organization.

Williamson (1985, 1975) reintroduced the ideas of Coase to a more recent generation of scholars and formalized the concept of transaction costs. In these two works, Williamson argues that transactions arise from one of two sources: bounded rationality and opportunistic behavior of contractual agents. Furthermore, these conditions become more problematic for exchange relationships when parties to an exchange use specific assets whose value is limited outside the scope of the immediate exchange relationship. Williamson establishes a typology of organizational forms ranging from market to hierarchy that each correspond to particular transaction cost dilemmas. The flexible specialization theorists discussed above argue that networks are a form of hybrid organization that lies somewhere between markets and hierarchies.

North (1990) applies the insights of Williamson, Coase, and others in the new institutional economics literature to propose a theory of economic development that is based on institutional adaptation and change. The essence of his argument is that political and economic institutions emerge primarily to resolve transaction cost dilemmas. The institutions that emerge establish the "rules of the game" for economic exchange and determine the expected private returns from investments in the local economy.

North (1991) elaborates on the role of institutions in economic development. Using a game theory analogy, North argues that institutions increase the social benefits of long-term cooperation. The institutions of capitalism have grown increasingly more complex due to the increasing complexity of economic exchanges. Institutional adaptation may either promote or discourage economic development. If the institutions that evolve are incompatible with the transaction cost demands of private investors, then a region may not grow. For example, if the property rights structure of a society does not recognize private contracts among economic agents, informal forms of governance may emerge to facilitate the capture of short-term profits among established elites while also serving to exclude outside inves-

tors. Similarly, large vertically integrated firms may emerge to monitor wage labor if contracts with external suppliers are not recognized.

5. EMERGING NEOCLASSICAL PERSPECTIVES

This overview of the theoretical literature on regional economic growth concludes with a discussion of two new perspectives that attempt to address earlier criticisms of the neoclassical exogenous growth and trade theories: *endogenous growth theory* and the *new economic geography*.

a) Endogenous Growth Theory

The new endogenous growth theories modify assumptions of the exogenous growth models to generate a range of economic predictions, some of which tend toward economic divergence across regions. However, endogenous growth theory stays true to the neoclassical tradition of general equilibrium modeling. The roots of endogenous growth theory can be traced to early work by Ramsey (1928), Cass (1965), Koopmans (1965), and Schumpeter (1947, 1934). Models by Cass (1965) and Koopmans (1965) adopt the utility function proposed by Ramsey to incorporate a savings rate that is determined by household choice, a feature that makes savings rates endogenous to the growth model. Under certain conditions, the Ramsey-Cass-Koopmans model predicts conditional convergence. If the savings rate rises with the capital/labor ratio, then the model predicts a slower speed of convergence than the Solow (1956) and Swan (1956) model (Barro and Sala-i-Martin 1999).

Other variants of the endogenous growth theories make technological change and innovation endogenous to the model. Schumpeter (1947) was the first to point out that the process of innovation is largely a race for monopoly control over the stream of rents from new innovations, which are essentially public goods once introduced. Arrow's (1962) "learning-by-doing" framework is within the Schumpeterian tradition by arguing that firms can gain monopoly power over new knowledge through experience in internal production. Innovations are modeled as declining costs that are functions of a firm's previous investments. If a firm can internalize these costs, they can gain a competitive advantage.

Romer (1986) relies on Arrow's learning-by-doing framework to incorporate technical change as an endogenous parameter within a competitive equilibrium model of economic growth. Romer's model is based on the crucial assumption that knowledge exhibits increasing marginal productivity characteristics. In other words, the production of consumption goods is modeled with a production function that includes the

stock of knowledge and other inputs. This production function assumes increasing returns to scale in the production of consumption goods, but decreasing returns to scale in the production of new knowledge, a feature that ensures mathematical tractability. In Romer's model, per capita output may be persistently slower over time in some countries than others; thus, the model departs from the standard neoclassical exogenous growth model by predicting divergence in regional growth rates. Furthermore, the equilibrium outcome is not necessarily pareto optimal.

Other than an early regional growth model with agglomeration economies and endogenous technical change proposed by Harry Richardson (1973), models of endogenous growth have only recently begun to consider the role of space and geography in shaping patterns of regional growth and decline. Nijkamp and Poot (1998) extend the Romer-Arrow framework to allow for spatial considerations such as factor mobility, the spatial diffusion of innovations, and interregional trade. The authors demonstrate that when these spatial interactions across regions are incorporated into a regional endogenous growth model, the empirical implications of the model are indeterminate. Depending on the specification of the model, absolute convergence, conditional convergence, and divergence are all theoretical possibilities.

Other recent theoretical models have extended the endogenous growth framework to account for the impacts of infrastructure investment on regional productivity. Barro (1990) develops an endogenous growth model that incorporates tax-financed public services. In this model, there is a nonlinear relationship between public investment and private output. Increases in government spending raise the marginal productivity of capital and labor, assuming a small to moderate ratio of government spending to total output. If this ratio becomes too large, the distortional effects of taxation predominate and lead to a declining growth rate. Aschauer (2000) extends Barro's framework to investigate the relationship between changes in public capital investment at the U.S. state level and statewide economic growth.

A special issue of the *Annals of Regional Science* (1998) surveys recent developments in regional endogenous growth theory. The model discussed by Rosser in this issue is unique, because it focuses on the impact of infrastructure on private sector coordination rather than complementarities between public and private capital investment. Drawing on interacting particle systems theory, Rosser demonstrates that infrastructure investments, especially communications, logistical networks, and transportation, allow private sector agents to coordinate activities across space. However, the

effects of coordination on economic growth are unclear. Coordination may result in either of two equilibrium outcomes: exceptionally high growth or exceptionally low growth.

Button (1998) reviews recent empirical studies on the relationship between public investment and regional economic growth and suggests that policymakers should proceed with caution in deriving policy prescriptions based on the evidence. Despite the appearance of several studies in the late 1980s that pointed to a correlation between declining U.S. productivity rates relative to other industrialized nations and the diminishing share of U.S. gross domestic product invested in new public infrastructure, the exact nature of this correlation is still the subject of much debate. Most criticisms of this literature center on the wide range of estimates regarding the impact of public investment on private performance, the lack of controls for the two-way causality between these two variables, and the lack of agreement over how to define and measure infrastructure investment.

b) The New Economic Geography

Paul Krugman's "new economic geography," although not explicitly a model of regional growth per se, does offer static predictions about the forces that lead to the emergence of industry clusters. Krugman's primary contribution is to incorporate external scale economies and increasing returns into traditional models of interregional trade. His work relies heavily on the general equilibrium model of monopolistic competition developed by Dixit and Stiglitz (1977).

Krugman's *Geography and Trade* (1991) outlines the basics of the new economic geography in a narrative framework. In Krugman's "core-periphery" model (not to be confused with John Friedmann's center-periphery model), regional clusters of economic activity emerge due to a combination of centrifugal and centripetal forces. On one hand, firms with strong scale economies will wish to serve national markets from a single location. To minimize the cost of delivering goods to market, firms will choose locations with a large local demand. This, in turn, is most likely to be where industries have already located, because firms desire to be close to their workers. The implication is that there is a form of circular causation at work: once a significantly-sized manufacturing belt has been established, it will tend to stay in existence. In general, a core-periphery pattern, defined as one where all manufacturing is located in the core and all agricultural production is located in the periphery, is sustainable with some combination of (1) large internal economies of scale, (2) low transportation costs, and/or (3) a large share of the regional population that is employed in manufacturing.

Although Krugman is generally cited as the originator of the new economic geography, many of Krugman's core ideas can be traced to Pred (1966), who puts a twist on traditional export base theory by arguing that the share of income spent on the local-serving sector varies with the size of the local market. In other words, as the size of the local market grows, it becomes more profitable to provide a larger share of goods locally, because larger plant sizes become more cost-effective. The theory ultimately developed by Pred combines the export base concept with the cumulative causation argument to demonstrate how the export base multiplier expands along with regional growth (Fujita et al. 1999).

More recent developments in the new economic geography are summarized in a special August 1999 edition of *International Regional Science Review* that features selected articles from the World Bank's Tenth Annual Bank Conference on Development Economics held April 20 and 21, 1998, in Washington, D.C. The theme of the conference was the link between geography and the economic success of countries and regions. Krugman (1999) suggests that recent models examining the role of geography in the economic development process generally take one of two approaches. The first approach explicitly considers the role of geographic factors such as climate and topography in determining patterns of regional growth and decline. Cronon (1991) is one example of this approach. The approach taken by most new economic geographers, on the other hand, is to ask why regional economies experience such different patterns of economic growth when there are no apparent geographic differences between regions. Krugman (1999) combines these two approaches to suggest that an understanding of the large effects of seemingly random events—an idea central to the new economic geography—can also be used to understand why differences in natural geographic features across regions can have such large persistent effects over time.

Despite its usefulness in explicitly representing the spatial dimension of regional growth and trade, the new economic geography models still rely on quite restrictive assumptions regarding worker mobility, land use, and regional dynamics. Fan et al. (2000) present a more generalized version of the new economic geography model that relaxes several of the assumptions in Krugman's earlier models. In contrast to earlier models in the new economic geography tradition, the Fan et al. framework allows for worker mobility across regions and sectors, introduces a more prominent role for land use, and incorporates a more flexible consideration of geographic space that allows for multiple regions in one or two dimensions. In the Fan et al. model,

systems of cities emerge endogenously as do different industrial structures and different patterns of land use.

6. CONCLUSION: TOWARD AN INTEGRATED
THEORY OF REGIONAL ECONOMIC DEVELOPMENT

It should be readily apparent to the reader that there are areas of overlap among many of these theories and much potential for integration. For example, the Myrdal (1957) and Kaldor (1970) cumulative causation model of growth-upon-growth is similar to the circular process that holds Krugman's (1991) core regions in place. Also, many models such as endogenous growth theory and cumulative causation theory could easily be expanded to incorporate institutional parameters or parameters that capture structural change. Among the newer theories discussed in this review, transportation costs only appear within the new economic geography. Transportation costs in a model of endogenous growth would be an obvious way to introduce realism into the model. Finally, although a few theories examined attempt to incorporate external economies, few do so in a satisfactory manner. There is still much to know about the nature of external economies and how institutions may foster the growth of such external benefits.

A few recent works have begun to establish linkages between different branches of theory. Bretschger (1999) integrates elements of endogenous growth theory, new economic geography, and traditional location theory into a model that considers the long-term impact of intra- and inter-regional knowledge diffusion on regional growth trajectories. Acs and Varga (2002) provide a survey of the new economic geography, endogenous growth theory, and the literature surrounding the economics of innovation and discuss how elements of each of these three approaches could be combined into a more general model of technology-led regional economic development. A model outlined by Fujita and Mori (1998) combines new economic geography and endogenous growth theory into a model that is used to explain the "Asia Miracle" and other so-called frontier economies.

Several works in the edited volume *Theories of Endogenous Regional Growth: Lessons for Regional Policies* (Johansson and Karlsson 2001) discuss ways to extend endogenous regional growth theory to account for the role of institutions in regional growth. Of particular interest are works in this volume by Stough and Harrington and Ferguson. Stough focuses on leadership, a specific institutional dimension that is largely ignored by researchers of endogenous growth. Leadership is shown to be associated with economic growth in a sample of U.S. metropolitan areas. Harrison and Ferguson suggest another way to integrate two strands of theory

by placing the new institutional economics into an endogenous growth context. In this work, the authors discuss several ways in which formal and informal institutions structure the labor processes necessary for economic growth.

D. Theoretical Perspectives on the Role of
Regional Development Planning and Policy

The most lively policy debate that has emerged in the literature concerns the nature of the market failures that justify public intervention and whether these efficiency interventions also result in an equitable distribution of wealth across regions, or conversely, whether interventions in the name of equity cause interregional inefficiencies. Below, a few seminal arguments in this tradition are reviewed and discussed.

Richardson (1979, 226) defines efficiency and equity in a regional context in the following manner: efficiency refers to the maximization of growth in the national economy. This also implies the optimization of resource allocation over time. Equity refers to the reduction in interregional disparities of income, wealth, and/or growth rates. (This definition of equity does not take into account other potential intraregional inequities that may exist across class, race, gender, or other aspatial categories.) Richardson (1979) examines several cases when the two goals of efficiency and equity may be compatible. First, as Williamson (1965) suggests, regional inequities may only be a problem during the early stages of a nation's development. As the nation grows and the economy matures, these inequities may diminish as Williamson demonstrates in his empirical analysis. Second, if infrastructure and labor are relatively homogeneous across the landscape, underdevelopment may simply be a case of the temporary underutilization of resources in particular regions. Third, some efficiency objectives (e.g., reducing externalities by relocating industries from a congested region to a lagging region) may be compatible with equity objectives. Richardson (1979) points to his own work to argue for the promotion of "generative" growth, which views interregional development not as a zero-sum game but as the foundation for national economic growth. He argues that regional planners should "be committed to fostering favorable growth conditions within a region rather than relying solely on the diversion of resources from other regions" (p. 179).

In the neoclassical models, free trade or factor mobility combined with optimal rates of regional investment should eventually lead to an efficient allocation of resources over time and a reduction in the income and growth disparities across regions over time, as suggested by the convergence hypothesis. If we accept the assumption that markets are more or less perfect and do

not question the other assumptions of the neoclassical trade and growth models, we can conclude that a policy intervention that successfully “corrects” market failures will achieve efficiency objectives while also removing regional inequities. Thus, the goal of equity need not be considered separately from efficiency; instead, interregional equity follows naturally from improvements in the efficient workings of the market. Of course, a limitation of this characterization of the policy dilemmas of equity and efficiency is that the compatibility of these two policy goals is heavily dependent on the accuracy of the neoclassical models of interregional growth and trade. If we introduce realism into the neoclassical trade and growth models by relaxing some of the models’ restrictive assumptions, we find that the convergence hypothesis does not always necessarily follow.

Generally speaking, relaxing most of the assumptions of the HOS model still leaves the model intact. For example, the model can easily be extended to allow for several regions, commodities, and factors provided that the number of commodities is equal to or larger than the number of factors. Similarly, factor mobility can easily be incorporated into the model, because it acts as a substitute for interregional trade in bringing about factor price equalization. With greater factor mobility, less trade is required among regions to equalize relative factor prices (Salvatore 1998).

When we relax the assumptions of constant internal and external returns to scale, homogeneous technologies and tastes, and perfectly competitive markets, the convergence result no longer holds or only holds for a smaller number of specific cases. New theories of trade and endogenous regional growth are currently being developed to incorporate many of these assumptions. These existing models incorporate increasing returns to scale and endogenous growth parameters and tend to generate a wide range of theoretical predictions, ranging from absolute convergence to cumulative processes of divergence.

Regarding the assumption of perfectly competitive markets, modifications to this assumption lie within the traditional domain of government policy intervention. Stiglitz (1989) discusses three primary types of market failure that tend to impair the market’s ability to produce interregional per capita income convergence over time: (1) the public good nature of knowledge, (2) information asymmetries in credit markets, and (3) imperfect information about product quality. The second two sources of market failure are more commonly observed at the national scale due to differences in the stability of political-economic institutions and culture across national boundaries. The market failures associated with knowledge generation are more pervasive in a regional

context. To see why, it is beneficial to begin with a discussion of the nature of the market failure at hand.

Technological change results from the generation of new knowledge. If knowledge were a purely private good like other inputs, firms could simply assume that it was an input into the production process and treat it much like other inputs. However, since new knowledge exhibits public good characteristics (nonexcludability and nonrivalry), the cost to the innovating firm is some positive quantity, whereas the cost to other firms in the industry is zero. This creates a typical “free rider” problem that often plagues public goods provision. The problem is that if knowledge is a public good, new knowledge will not be provided by the private market without some form of nonmarket intervention that enables innovating firms to capture rents from knowledge generation.

Stiglitz (1989) draws on Arrow (1962) and argues that, due to the public good nature of knowledge, timing plays an important role in the generation of new knowledge. As a region increases its production over time, the costs of production may fall, because workers become more experienced at their jobs and produce new knowledge that results in further declines in costs. With this learning by doing, regions that industrialize first will experience greater cost advantages than regions that industrialize later. This may act as a barrier to entry for regions that are late to develop. Thus, with learning by doing, growth rates between industrialized regions and lagging regions may diverge over time depending on the nature of learning, in particular the extent to which institutions promote learning and the diffusion of learning across regional boundaries.

Several subtleties of the learning-by-doing phenomenon noted by Stiglitz (1989) affect the extent to which less developed regions will benefit from the knowledge generated in more developed regions. First, learning may be more or less localized. If knowledge diffusion among firms does not extend beyond regional boundaries, then the benefits of knowledge generation will only be captured by particular regions. For example, U.S. innovations in the electronics industry during the 1970s were largely confined to Silicon Valley and Boston’s Route 128 (Saxenian 1994). In this case, the inability of regions outside of these two regions to benefit from the knowledge generated suggests that other regions outside of Silicon Valley may find it difficult to catch up once regional patterns of innovation have become well established.

Not only is learning localized, but it also generates other positive externalities such as innovations in related industries and improvements in the region’s business climate. To the extent that these externalities, too, are localized, the benefits of learning will not be

captured by all regions in the national economy. With these learning-based externalities, there may also be positive feedbacks that result in cumulative benefits over time. Stiglitz (1989) eloquently describes this cumulative process:

Assume that there are two groups within the population: innovators and inventors. Inventors generate new ideas; innovators turn them into profitable businesses. Innovators search among inventors for new ideas. The more inventors there are, the more it pays to be an innovator; and the more innovators there are, the greater the returns to invention. (P. 199)

Thus, regions with a large initial supply of inventors will tend to attract innovators, which in turn attracts more inventors. This process closely resembles the divergent cumulative process of regional development described by Myrdal (1957).

A final characteristic of learning by doing that is important for regional development is "hysteresis." Here, the extent of learning by doing in any given period may be determined by historical factors such as wars, plagues, or depressions that have permanent effects on a region's ability to generate new knowledge. Similarly, a region's ability to learn by doing may be determined by its previous history of learning by doing. For example, Richardson (1979) points out that learning may be more likely in large cities because cities tend to have a disproportionate share of "innovation-adopting elites," defined as an entrepreneurial class that is more receptive to new ideas and innovations.

The learning-by-doing phenomenon creates several dilemmas for regional economic development planners. First, even if knowledge diffused instantaneously throughout society once created, it still may be underprovided, because it would not be economically rational for any private inventor to invest in the creation of new knowledge if they immediately lost all gains from knowledge creation. This is the market failure problem created by the public good nature of knowledge.

Even without the spatial problems discussed above, to increase the probability of knowledge generation, the planner must develop a patenting system or other form of knowledge-generating incentive. Since patents effectively grant monopoly power to the inventor for a defined period of time, the planner is faced with an optimization problem when deciding whether to issue incentives such as patents. He or she must choose a knowledge-generating institution that maximizes the expected benefits from new knowledge, taking into account the market distortions resulting from monop-

oly pricing by the innovating firm (Carlton and Perloff 2000).

When the spatial dimension of knowledge generation is introduced, the planner's decision becomes more complex, because now, the choice of policy intervention has implications for both national efficiency and interregional equity. With learning by doing, regional growth is more likely to produce interregional per capita income divergence over time. Thus, even when the public good dilemma of knowledge generation has been resolved in a region like Silicon Valley, the localized nature of knowledge diffusion suggests that the benefits of the new knowledge may not extend beyond Silicon Valley. If there are increasing returns to scale in new knowledge generation, the emergence of a Silicon Valley may also draw high-skilled labor away from other regions in the United States, thus further exacerbating interregional inequities in economic growth along with potential inefficiencies associated with the underproduction of new knowledge in declining regions.

Given the nature of this problem, a regional planner in a declining region may proceed in one of three ways. First, he or she may acknowledge the market imperfections associated with the public good characteristics of knowledge and work to create local institutions, such as financial incentives for innovations, business incubators, or other local incentive programs, that increase the probability of local innovation without creating anticompetitive local monopolies. If successful, this may restore the competitiveness of lagging regions and restore trends toward per capita income convergence, thus simultaneously accomplishing equity and efficiency objectives by diverting growth away from more developed regions toward undeveloped regions.

A problem with this approach from Stiglitz's (1989) perspective is that the nonmarket institutions created by less developed regions to resolve market failures tend to be less successful in accomplishing this objective than the nonmarket institutions in more developed regions. For example, the diffusion of innovations often requires the presence of mature financial, managerial, and marketing firms. Even if firms have an incentive to create new ideas in lagging regions, they may have little access to the financial capital or the marketing resources required to bring their ideas to market. Similarly, the probability of interaction and knowledge sharing among local firms may be determined by the number of opportunities for local interaction. In regions with declining downtowns and few venues for eating, drinking, and socializing, workers may not interact frequently enough to cultivate substantial local knowledge spillovers.

Another problem is that if financial incentives offered by local planners encourage new firms to locate in an underdeveloped region, when they would have located in a more advanced region, then the underdeveloped region may be inefficiently supporting an industry in a location where it is suboptimal for that industry to conduct business. For example, an automobile manufacturing firm may be attracted to a region by generous property tax subsidies, only to discover upon locating in that region that the region's natural resources and labor skill level are poorly suited for automobile production. This may, in turn, reduce the probability of economic success for that firm, which would have negative long-term regional consequences due to job losses.

Another approach is to assume the role of a national policymaker and devise institutions that increase the geographic spread of knowledge generation across all regions, thereby reducing the localization of knowledge generation. For example, a national policymaker may publish information about local innovations in an outlet that is accessible to firms in other regions. The problem with this approach is that it would likely destroy the very incentive that leads to the creation of knowledge in the first place: the potential for monopoly profits from new knowledge. If the strategy of geographic dispersion of knowledge is chosen, it would only be effective if such dispersal had no effect on the monopoly profits earned by the generators of new knowledge.

A final approach is to redistribute some of the wealth gains from rapidly growing regions experiencing new knowledge generation to other regions. This approach is tantamount to intervening directly on equity rather than efficiency grounds. Bolton (1992) offers one of the most interesting perspectives on this issue. The purpose of his article is to challenge an earlier article by Louis Winnick (1966), which criticized national policies aimed at improving places rather than the people living within the places. Winnick argued that such place-specific redistributive policies are inappropriate, because they tend to result in the subsidized survival of high-cost firms in particular locations, tend to ascribe to an entire region the average characteristics of that region without focusing on the internal heterogeneity of the population, and tend to provide too much support to location-bound governments that cannot migrate to escape regional malaise. Bolton challenges Winnick's argument by pointing to specific instances when place-specific policies may be *necessary* for economic efficiency. This would be the case if "places" provide a public good valued by society. Regarding the nature of this public good, Bolton points to the option value of places, the pure existence value of places, and the correlation

between donor preferences for redistribution to recipients in specific locations. For example, if entrepreneurs in Silicon Valley see an option value, pure existence value, or have specific donor preferences for redistribution in regions outside of Silicon Valley, then redistribution on equity grounds may be required for efficiency reasons (Bolton 1992).

The important point here is that although efficiency and equity are often intertwined when we consider the spatial dimension of market failures resulting from knowledge generation, the traditional approach to regional market intervention (i.e., "Intervene on efficiency grounds and equity goals will be achieved automatically.") need not always be optimal. In fact, it may be the case that direct intervention on equity grounds is more likely to accomplish both efficiency and equity objectives than is intervention on efficiency grounds alone, especially if the institutions in poverty-stricken regions are ill-equipped to resolve market failures and regional growth processes fail to conform to the standard neoclassical models.

To conclude, the convergence-divergence debate is no longer simply an academic debate when viewed in light of policy issues related to efficiency and equity. If one accepts the convergence hypothesis, then one can assume that lagging regions will tend to grow faster and approach standards of living in developed regions over time, and inequities will be resolved in the long run simply by improving the functioning of the market. If, on the other hand, there are substantial market imperfections in regional trade and knowledge diffusion, as suggested by Stiglitz (1989), then market inefficiencies will result in interregional inequities. The appropriate strategy for improving interregional efficiency and/or equity depends on the nature of the original source of divergence and the benefits and costs of diverting the path of growth in the other direction. Either way, theory has much to say about the consequences.

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II. ANNOTATED BIBLIOGRAPHY

A. *What Is a Region?*

001. Fox, Karl A., and T. Krishna Kumar. 1994. The functional economic area: Delineation and implications for economic analysis and policy. In *Urban-regional economics, social system accounts, and eco-behavioral science: Selected writings of Karl A. Fox*. James R. Prescott, Paul van Moeskeke, and Jati K. Sengupta, eds. Ames: Iowa State University Press.

In this chapter, the authors discuss their "functional economic area" concept. Within a functional economic area, the majority of households commute to jobs within the region, and the majority of goods sold are consumed within the region. Functional economic areas, much like the metropolitan statistical areas identified by the U.S. Census Bureau, are defined by the spatial extent of household commuting areas (Richardson 1978). The United States Department of Commerce Bureau of Economic Analysis (BEA) currently relies on a version of this approach to define BEA economic areas within the United States.

002. Hoover, Edgar M., and Frank Giarratani. 1985. *Introduction to regional economics*. 3d ed. New York: Knopf.

This classic text gives a nice overview of the conceptual foundations of regional economic development theory and urban land use theory. Chapter 9 of this book examines several approaches to defining the concept of a "region." This entire text can be accessed online at the following URL: <http://www.rri.wvu.edu/WebBook/Giarratani/main.htm>.

B. *Conceptual Foundations of Regional Economic Development Theory*

1. THE INTERREGIONAL CONVERGENCE HYPOTHESIS

003. Balassa, Bela. 1961. *The theory of economic integration*. Homewood, IL: Irwin.

In this book, Balassa examines the integration of national economies with particular interest on European countries. Chapter 4 of this book provides a nice overview of the Heckscher-Ohlin theorem and its implications for European integration. He also examines the role of factor mobility in the theory of economic integration.

004. Heckscher, Eli F. 1919. The effect of foreign trade on the distribution of income. *Ekonomisk Tidskrift* 21: 497-512.

005. Ohlin, Bertil. 1933. *Interregional and international trade*. Cambridge, MA: Harvard University Press.

Together, these two works establish the well-known "Heckscher-Ohlin" theorem, which essentially states that given two countries, two export goods, and two factors of production, a factor-abundant country will have a comparative advantage in the production of goods that require that factor. Therefore, the country will specialize in, and export that good, importing goods for which production factors are scarce.

006. Salvatore, Dominick. 1998. *International economics*. 6th ed. Upper Saddle River, NJ: Prentice Hall.

This international economics text provides an excellent overview and analysis of the Heckscher-Ohlin-Samuelson theorem and the implications of this model's assumptions for international trade and economic growth.

007. Samuelson, Paul A. 1953. Prices of factors and goods in general equilibrium. *Review of Economic Studies* 21, 1 (October): 1-20.

008. ———. 1949. International factor-price equalization once again. *Economic Journal* 59, 234: 181-97.

009. ———. 1948. International trade and the equalization of factor prices. *Economic Journal* 58, 230: 163-84.

These three articles extend the Heckscher-Ohlin theorem to demonstrate the now-famous result: free trade and/or the mobility of goods serves to equalize the relative and absolute prices of factors of production across those countries engaged in trade in the long run.

2. LOCATION THEORY AND REGIONAL SCIENCE

010. Alonso, William. 1975. Location Theory. In *Regional policy: Readings in theory and applications*, John Friedmann and William Alonso, eds. Cambridge, MA: MIT Press.

This article gives an overview of the fundamental concepts from location theory initially developed by Alfred Weber (1929) and subsequently expanded by Edward Hoover (1937), Walter Isard (1956), and Melvin Greenhut (1956). By 1975, the foundations of location theory, as it is reviewed by Alonso, had become well established. Additional complexities examined by Alonso include the influence of assembly costs and distribution costs, the role of transshipment points, and the implications of multiple raw material sources and irregularly shaped transportation networks and market areas on optimal plant location. Alonso concludes the article by pointing out the limitations of the location theory approach, including its static orientation, its ignorance of external scale economies, and the tendency of early theories to treat demand as exogenous.

011. Isard, Walter. 1956. *Location and space-economy*. Cambridge, MA: MIT Press.

A comprehensive exposition of traditional location theory as originally developed by Alfred Weber (1929) and Edgar Hoover (1937). The work also incorporates the market area concept developed by Christaller (1933) and Losch (1954) as well as the relationship between location theory and

international trade theory. Chapter 10 provides a mathematical formulation of Isard's general theory of location.

012. Isard, Walter, Iwan J. Azis, Matthew P. Drennan, Ronald E. Miller, Sidney Saltzman, and Erik Thorbecke. 1998. *Methods of interregional and regional analysis*. Brookfield, VT: Ashgate.

This book is Walter Isard's sequel to the seminal regional science text, *Methods of regional analysis: An introduction to regional science* (1960). The text presents a summary of the standard methodological approaches to analyzing regional economies. Included in the discussion are traditional techniques such as comparative cost analysis, input-output analysis, linear and nonlinear programming, and gravity and spatial interaction models in addition to more recent methods of analysis including spatial econometrics, computable general equilibrium models, and spatial micro-simulation.

013. Weber, Alfred. 1929. *Theory of the location of industries*. Chicago: University of Chicago Press.

The beginnings of location theory can be traced to this classic by Alfred Weber. In essence, this work is an attempt to incorporate transportation costs into the theory of the firm. In Weber's theory, transportation costs are influenced by weight and distance. He assumes that demand is given and that firms seek to minimize the costs of transporting raw materials and final goods to the market. If natural resources and raw materials are concentrated in particular locations, and the weight of the raw material is heavy relative to the weight of the final product, the firm's production activities are "weight losing." These firms will locate near input sources, while "weight-gaining" firms will tend to locate near consumer markets. This simple idea has become the foundation of modern location theory. Chapter 5 of Weber's book also contains an early discussion of agglomeration economies.

3. EXTERNAL ECONOMIES

014. Hoover, Edgar M. 1937. *Location theory and the shoe and leather industry*. Cambridge, MA: Harvard University Press.

In chapter 6 of this classic work, Edgar Hoover develops his well-known typology of agglomeration economies in response to the oversimplification of this concept in Weber's (1929) work. Hoover argues that the benefits from agglomeration include (1) *large-scale economies* resulting from traditional economies of scale; (2) *localization economies* that result from the firms in the same industry colocalizing in the same area; and (3) *urbanization economies*, which result from the colocalization of firms in different industries.

015. Marshall, Alfred. [1890] 1961. *Principles of economics: An introductory volume*. 9th ed. Reprint, London: Macmillan.

In this classic text, Alfred Marshall became the first to make the distinction between *internal* and *external* scale economies. Internal scale economies are generated internally by individual firms that either expand their internal scale of operations to minimize average production costs (traditional economies of scale). External scale economies refer to declines in firm-level average costs that result from increases in industry-wide output within a given region. Examples of external scale economies include the spillover benefits that result from a specialized local labor force, a large diverse supply of input providers, and information sharing among firms within a region. The metaphor of the "Marshallian industrial district," fueled by these external scale economies, is a key concept in most recent theories of regional economic development. It is this emphasis on local external scale economies that also differentiates many theories of regional economic development from theories of national economic development.

4. MODELS OF SPATIAL COMPETITION

016. Devletoglou, Nicos E. 1965. A dissenting view of duopoly and spatial competition. *Economica* 32, 126: 140-60.

This article extends Hotelling's (1929) spatial pricing approach by introducing realism into the model. The extensions examined by Devletoglou include consumer demand uncertainty and elasticity, the threat of entry by competitors, and an additional spatial dimension to consumer market areas. (In the Devletoglou model, consumers are distributed along a plane rather than along a line segment as in the Hotelling model.) With these additional assumptions, Devletoglou demonstrates that under certain conditions, firms will tend toward dispersion rather than concentration, as in the Hotelling model. In the Devletoglou model, the threat of entry drives all profits to zero.

017. Eaton, B. Curtis, and Richard G. Lipsey. 1978. Freedom of entry and the existence of pure profit. *Economic Journal* 88, 351: 455-69.

This article extends the model by Devletoglou (1965) to demonstrate how a spatial equilibrium distribution of firms need not necessarily drive profits to zero. According to Eaton and Lipsey, there is no incentive for new firms to enter, because for new firms, all costs are variable, whereas for existing firms, all fixed costs are sunk and therefore do not bear on current production decisions.

018. Hotelling, Harold. 1929. Stability in competition. *Economic Journal* 39, 153: 41-57.

This classic of the industrial organization literature has led to the emergence of a large literature that examines how space affects the pricing behavior of firms. Although not always identified as part of location theory per se, the literature on spatial competition that begins with Hotelling

provides a nice companion to the supply-side location-theoretic approach pioneered by Alfred Weber (1929).

5. CENTRAL PLACE THEORY

019. Christaller, Walter. [1933] 1966. *Central places in southern Germany*. Trans. Charlisle W. Baskin. London: Prentice Hall.

Christaller, a German geographer, presents the first formulation of central place theory. His version of the theory was developed primarily as a descriptive tool for explaining the distribution of cities of different sizes across space. The essence of Christaller's original argument is that if one considers transport costs alone, the optimal configuration of market areas for individual firms is a pattern of adjacent hexagons. Since some market areas will be larger for some firms than others, a hierarchy of urban centers emerges naturally from the concentration of several-sized market areas in particular areas. Those places with the most diversity in the range of goods offered are defined as "central places." In general, central place theory predicts that (1) towns of a given size will be located roughly the same distance apart; (2) there will be few large cities and many small cities dispersed throughout economic space; (3) small towns exist to serve local customers, whereas large cities serve local markets and customers from smaller towns. Christaller relies on his theory to explain the spatial distribution of towns within southern Germany.

020. Losch, August. 1954. *The economics of location*. New Haven, CT: Yale University Press.

Losch largely expands on the initial ideas of Christaller (1933) and places them into an economic context, introducing the idea of a "demand cone" into the hexagonal market area framework developed by Christaller. Central places are large diversified urban areas that have a range of economic activities operating at varying scales. Losch defines an optimal central place, referred to as the "urban cogwheel," that has the highest diversity of market offerings for regional customers.

021. Mills, Edwin S., and Michael R. Lav. 1964. A model of market areas with free entry. *Journal of Political Economy* 72, 3: 278-88.

Mills and Lav challenge Losch's (1954) contention that free entry among firms results in an equilibrium outcome with hexagonal market areas and no spaces between market areas. In particular, the authors demonstrate that with circular market areas, there may be open spaces between adjacent market areas that are not filled by new firms under conditions of free entry. In other words, some firms may continue to earn positive profits over some region under conditions of spatial competition. This is an important result, because it implies that spatial competition may not necessarily produce an optimal social outcome.

C. Alternative Theories of Regional Economic Development

1. THEORIES OF REGIONAL ECONOMIC CONVERGENCE

a) Economic Base Theory

022. North, Douglass C. 1956. Exports and regional economic growth: A reply. *Journal of Political Economy* 64, 2: 165-68.

In this article, North replies to Tiebout's criticisms (1956a) of the export base model by pointing out that the model is intended to be viewed as a long-run model of economic growth that may not always be applicable in the short run when certain factors of production are fixed and immobile.

023. ———. 1955. Location theory and regional economic growth. *Journal of Political Economy* 63, 3: 243-58.

The author proposes the export base model of regional economic growth by linking two previously disparate branches of economic theory: location theory and regional economic development theory. He begins by criticizing the "stages" perspective of Edgar Hoover and Joseph Fisher (1949) that views regional development as progress through various stages. North argues that this perspective is largely inconsistent with reality and fails to explain why regions progress through the various stages of growth. Instead, North argues that regional development during the modern era has emerged primarily from the efforts of capitalists to exploit regional resources to meet demands on the world market and not from the gradual progression of an economy from subsistence to more advanced forms of exchange.

024. Richardson, Harry W. 1978. *Regional economics*. Urbana: University of Illinois Press.

On pages 84-92, Richardson presents three formal versions of export base theory that are useful for empirical analyses. Model 1 assumes that nonbase income is a stable function of total income and total income is a multiple of base income. Model 2 employs a Keynesian-type approach that decomposes expenditures into domestic spending, import spending, and export spending. Model 3 presents the export base model as a growth model that examines income changes over time. This allows income to evolve differently for basic and nonbasic sectors.

025. Tiebout, Charles M. 1956a. Exports and regional economic growth. *Journal of Political Economy* 64, 2: 160-64.

Tiebout places North's export base model (1955) within a more general framework that accounts for the influence of regional growth on per capita incomes. North's model, according to Tiebout, ignores the importance of many important supply-side factors, which ultimately affect a region's ability to support an emerging export base. He also criticizes North's article by pointing to other instances

when exports are not the sole determinants of regional economic growth. Another contribution of this article is the introduction of the regional multiplier concept. The regional multiplier measures the ratio of "basic" to "nonbasic" regional economic activities. This multiplier is one useful way to quantify the impact of an increase in exogenous demand on overall levels of regional growth.

026. ———. 1956b. Exports and regional economic growth: Rejoinder. *Journal of Political Economy* 64, 2: 169.

In this fourth and final article in the North-Tiebout debate, Tiebout reiterates that the export base concept is merely an oversimplified version of more sophisticated general equilibrium national per capita income models. Furthermore, the "stages" theory of economic growth that North criticizes is not necessarily wrong, according to Tiebout. Instead, it is only applicable for a more limited number of cases.

b) Neoclassical Exogenous Growth Theory

027. Barro, Robert J., and Xavier Sala-i-Martin. 1999. *Economic growth*. Cambridge, MA: MIT Press.

This book provides an excellent overview of the modern neoclassical theory of economic growth with emphasis on national economic growth. The introduction provides an overview of the relevant literature in this field. Chapter 9 provides an extension to the standard model that allows for labor migration—an extension that is necessary to apply the model in a regional context.

028. Borts, George H. 1960. The equalization of returns and regional economic growth. *American Economic Review* 50, 3: 318-47.

This article reconciles two competing explanations for regional differences in growth rates: supply-side differences in production functions and/or input costs versus differences in export product demand. After proposing a model and examining empirical data, Borts finds that movements of capital and the growth of wage rates among states in the United States were primarily in response to demand shocks, thus suggesting that regional export base models are useful ways to model regional economic growth. With regard to interregional wage convergence, Borts argues that the likelihood of this outcome in the future depends on three factors: migration from low-wage areas to high-wage areas, elimination of the disproportionately high birth rates in low-wage areas, and capital reinvestment in low-wage areas.

029. Borts, George, and Jerome Stein. 1964. *Economic growth in a free market*. New York: Columbia University Press.

This is one of the few works to consider both the supply and demand side of the market as it affects regional economic development with particular emphasis being paid to the former. Chapter 7 discusses the overall theory developed from several empirical regularities observed in earlier chapters. This model is basically an extension of extant

neoclassical exogenous growth models developed to explain national growth, with modifications to allow for the openness of regional economies. These modifications allow for net capital and labor flows, which are treated as exogenous in the Borts-Stein model.

030. Perloff, Harvey S., Edgar S. Dunn Jr., Eric E. Lampard, and Richard F. Muth. 1960. *Regions, resources, and economic growth*. Baltimore: Johns Hopkins University Press.

This work is offered as a departure from traditional export- and sector-based theories of regional growth, both of which were predominant paradigms for regional development during the 1950s. Without dispelling of either view, the authors examine a wealth of empirical data to demonstrate that the reality of regional growth and decline is much more complex than either theory dares admit. Consistent with neoclassical theories of regional growth, the authors find evidence that per capita incomes in the United States have indeed tended toward equalization over time. Despite this overall trend, the authors also find great variety in regional paths toward economic development. The three regions that had below-average per capita incomes in 1880 were still below average in 1957 (p. 51). Regarding the volume of growth, some regions experienced more rapid growth during the period examined than other regions.

031. Solow, Robert M. 1956. A contribution to the theory of economic growth. *Quarterly Journal of Economics* 70, 1: 65-94.

032. Swan, Trevor W. 1956. Economic growth and capital accumulation. *Economic Record* 32, 44: 334-61.

Together, these two articles provide the basis for the neoclassical exogenous growth model. Although earlier models of economic growth were also proposed by Roy F. Harrod (1939) and Evsey D. Domar (1946), the Solow-Swan models have been much more influential in modern growth theory.

033. Williamson, Jeffrey G. 1965. Regional inequality and the process of national development: A description of the patterns. *Economic Development and Cultural Change* 13, 4: 158-200.

Although this is an empirical work, it has much to say about regional inequalities in national and international development patterns. Williamson argues that regional inequality is likely to increase in the early stages of national development for several reasons. First, labor migration rates are unequal due to differences in the costs of migration and differences in the way migrant workers are perceived vis-à-vis indigenous workers. Second, initial endowments or constraints, external economies of scale, and immature capital markets in some regions may impede equal capital flows across regions. Third, central government policies may be biased toward regions that are more politically mobilized or where economic growth creates the need for additional capital investments. Finally, there may be few interregional linkages in the early stages

of national growth. Williamson hypothesizes that these inequalities are most likely to appear in the early stages of national growth but are likely to equalize North-South inequalities over time. Using a variety of empirical methods ranging from cross-sectional comparisons to time-series analysis, Williamson presents evidence to support this hypothesis. Williamson also finds that inequalities are more pervasive in the agricultural sector than in the industrial sector.

2. THEORIES OF REGIONAL ECONOMIC DIVERGENCE

a) Cumulative Causation Theory

034. Dixon, Robert J., and Anthony P. Thirlwall. 1975. A model of regional growth rate differences on Kaldorian lines. *Oxford Economic Papers* 27, 2: 201-14.

This is one of the first formal presentations of the cumulative causation theory as developed by Myrdal. In their derivation, the authors find that the cumulative causation does not necessarily predict interregional divergence given reasonable model parameter values.

035. Kaldor, Nicholas. 1970. The case for regional policies. *Scottish Journal of Political Economy* 17, 3: 337-48.

This article elaborates on and expands Myrdal's theory of cumulative causation (Myrdal 1957). Kaldor's contribution is to introduce ideas from export base theory and the concept of an efficiency wage to lend more formalism to the Myrdal model.

036. Myrdal, Gunnar. 1957. *Economic theory and underdeveloped regions*. London: Duckworth.

The roots of cumulative causation theory can be traced to this seminal work. Here, Myrdal challenges the neoclassical economic proposition that unfettered trade between regions would ultimately lead to a reduction in inequalities across regions. Instead, Myrdal argues, increasing returns to scale results in the clustering of economic activity within regions that are first to industrialize. Moreover, the process of growth tends to feed on itself through a process that he describes as cumulative causation.

037. Setterfield, Mark. 1997. "History versus equilibrium" and the theory of economic growth. *Cambridge Journal of Economics* 21, 3: 365-78.

This article presents a mathematical extension of the Kaldorian model of cumulative causation as formalized by Dixon and Thirlwall (1975). Alternative equilibrium and disequilibrium formulations of the model are discussed along with the implications of either approach. The author also extends the disequilibrium approach to allow for the "lock-in" effects of prior institutional and technological regimes.

038. Skott, Peter, and Paul Auerbach. 1995. Cumulative causation and the "new" theories of economic growth. *Journal of Post Keynesian Economics* 17, 3: 381-402.

The cumulative causation theory is examined in light of the new endogenous growth theories to determine if the two are complements or substitutes. Although the early authors in the cumulative causation tradition were quick to criticize neoclassical economic approaches to growth, recent development in endogenous growth theory incorporate ideas that were fundamental to cumulative causation theorists, especially increasing returns to scale. The authors conclude that while the new endogenous growth theories appear to offer many significant advances over the simple cumulative causation model, new growth theory relies on many unrealistic assumptions and fails to account for the role of institutions in the growth process.

b) Growth Pole Theory

039. Boudeville, Jacques Raoul. 1966. *Problems of regional economic planning*. Edinburgh: Edinburgh University Press.

This book is one of the first attempts to place Perroux's (1950) abstract theories about spatial relations among firms into a regional context based on geographic space.

040. Darwent, D. F. 1969. Growth poles and growth centers in regional planning: A review. *Environment and Planning* 1, 1: 5-31.

This is a review and critique of many major works in the growth pole/growth center tradition. Darwent's criticisms of growth pole theory largely focus on the theory's limited ability to offer an explanation for the urbanization process. The limitations of growth pole theory in this respect are largely due to the initial aspatial formulation of the theory by Perroux (1950). Authors since Perroux, particularly Friedmann (1972) and Boudeville (1966), have attempted to remedy this problem by incorporating space into the concept of a growth center. Unfortunately, the growth center literature suffers many of the same flaws as the early growth pole works. In particular, Darwent argues that the theory is primarily a descriptive theory that offers no account of the actual processes that cause growth to occur and cause some growth poles to grow faster than others. The explanatory basis of growth pole theory largely hinges on an oversimplification of input-output relationships between "propulsive" and "affected" industries, thus ignoring external economies within the region and demand shifts external to the region.

041. Friedmann, John. 1978. The spatial organization of power in the development of urban systems. In *System of cities*, Larry S. Bourne and James W. Simmons, eds. New York: Oxford University Press.

Friedmann further discusses his views of spatial patterns of dependency.

042. ———. 1972. A general theory of polarized development. In *Growth centers in regional economic development*, Niles M. Hansen, ed. New York: Free Press.

This article presents a more fine-tuned version of the initial core-periphery model developed in Friedmann (1966). The core-periphery model expressed here places more empha-

sis on the role of innovation in maintaining the spatial core-periphery pattern and discusses the role of social relations in legitimizing the innovations adopted by the core. Friedmann also points out that while the core-periphery pattern is relatively stable, the tensions in the patterns of authority-dependency relationships may eventually produce undesirable social outcomes.

043. ———. 1966. *Regional development policy: A case study of Venezuela*. Cambridge, MA: MIT Press.

Friedmann's center-periphery model is largely based on Gunnar Myrdal's (1957) theory of unbalanced regional growth, but it also incorporates elements of export base theory and a discussion of the role of local leadership in determining a region's growth trajectory.

044. Hermansen, Tormod. 1972. Development poles and development centres in national and regional development. In *Growth poles and growth centres in regional planning*, Antoni Kuklinski, ed. Paris: Mouton.

This chapter gives a thorough and critical review of the diverse growth pole literature. It also makes useful linkages between growth pole theory and related works in cumulative causation theory and central place theory. This work, in addition to the 1969 work by Darwent, offers early criticisms of a theoretical perspective that was at the time a well-accepted paradigm among regional development theorists.

045. Higgins, Benjamin. 1983. From growth poles to systems of interaction in space. *Growth and Change* 14, 4: 1-13.

In this article, Higgins reexamines the growth pole literature in light of its criticisms that emerged in the 1970s and the reemergence of the term in the early 1980s. Among the major criticisms discussed by Higgins are the lack of coherence between traditional notions of growth poles and empirical reality, the inappropriate use of input-output analyses to examine the spatial interactions among firms, and the difficulties of translating Perroux's (1950) original abstract formulation into useful theories of regional economic development.

046. Hirschman, Albert O. 1958. *The strategy for economic development*. New Haven, CT: Yale University Press.

The author offers an alternative to the prevailing balanced growth paradigm, also referred to as the "theory of the big push" (p. 51), which essentially states that economic development requires the simultaneous development of a large number of new industries to support the linkages required for steady growth. Hirschman argues instead for a theory of economic development based on the concept of backward and forward linkages among firms. For a given firm, backward linkages refer to the inputs of other firms used in the production process, whereas forward linkages refer to the output of the firm that is then used by other local producers as an intermediate good for the production of other products (p. 100).

047. Lasuen, Jose Ramon. 1972. On growth poles. In *Growth centers in regional economic development*, Niles M. Hansen, ed. New York: Free Press.

This chapter is a reinterpretation of Perroux's (1950) initial polarization concept in light of more recent policies designed to promote the development of growth poles. Lasuen argues that due to recent transportation innovations and inter- and intrafirm organizational changes, growth and development have resulted in less geographic polarization than in the past (p. 34). Lasuen recommends that developing regions adopt policies to foster these linkages, pointing to the case of Japan as an example. This chapter points to other possible links between the growth pole literature and the network/flexible specialization literature that would eventually emerge in the 1980s.

048. Perroux, Francois. 1950. Economic space: Theory and applications. *Quarterly Journal of Economics* 64, 1: 89-104.

This is the seminal work in the growth pole/growth center tradition. Although Perroux's initial formulation of the theory only treats space in the abstract, his ideas about the spatial relationships between economic agents were eventually developed by Boudeville (1966) and others into a spatial account of economic growth through polarizing forces among interdependent firms and industries in particular locations. Perroux defines three ways to define space: space as defined by a plan, space defined as a sum of forces, and space as a homogeneous aggregate (p. 94). His article explores each conceptualization of space by examining the spatial dimension of monetary flows and national sovereignty. The concept of the growth pole has come to adopt the "space as force" view of spatial interaction, which defines space as a type of network that is held together by centripetal forces. Although this view of space is not unlike that which is advocated by those in the flexible specialization/network theory tradition, the two theoretical perspectives have largely developed in isolation from one another.

049. Thomas, Morgan. 1972. The regional problem, structural change, and growth pole theory. In *Growth poles and growth centres in regional planning*, Antoni Kuklinski, ed. Paris: Mouton.

This chapter seeks to address the failure of growth pole-induced policy prescriptions to result in a significant reversal of unbalanced growth trends. The failures of growth pole theory appear in its inability to account for structural change within growth poles over time and the lack of existing knowledge about the spatial dimensions of growth (p. 75). Thomas addresses the former by discussing the behavioral foundations of growth pole theory. In particular, the author is concerned with identifying the actual processes underlying industrial change within growing regions. Thomas also calls for the incorporation of a dynamic version of location theory into the growth pole framework as a way to understand the spatial dimension of growth.

3. STRUCTURALIST THEORIES

a) Stage/Sector Theories

050. Henderson, J. Vernon. 1974. The sizes and types of cities. *American Economic Review* 64, 4: 640-56.

In this seminal theoretical argument linking industry structure to city size distributions, Henderson suggests that the optimal size of any given city will depend on its role, which is a function of the industry structure that dominates the city.

051. Hoover, Edgar M., and Joseph L. Fisher. 1949. Research in regional economic growth. In *Problems in the study of economic growth*, Universities-National Bureau Committee on Economic Research. New York: National Bureau of Economic Research.

This work presents an early stage theory of regional economic growth that views economic development as a natural progression through various sectoral changes, ultimately resulting in the emergence of a specialized export base industrial economy.

052. Pred, Allan. 1977. *City systems in advanced economies*. Berkeley: University of California Press.

In this work, the author outlines the historical context underlying the economic development of city systems. A central premise of the work is that "spatial biases" in the flow of information tend to give incumbent urban centers an advantage in economic growth.

053. Rostow, Walt W. 1977. Regional change in the fifth Kondratieff upswing. In *The rise of the Sunbelt cities*, David C. Perry and Alfred J. Watkins, eds. Beverly Hills, CA: Sage.

In this chapter, Rostow explores the implications of the "Fifth Kondratieff Upswing" on regional economic development, particularly in the declining cities in the northeastern United States. The term *Kondratieff cycle* refers to an empirical regularity recognized by the Russian economist, Nikolai Kondratieff (1935). He found that capitalist economies tended to ebb and flow in cycles of forty to fifty years (p. 88). Rostow points to historical shifts in the relative prices of food and raw materials relative to manufacturing goods as an explanation for these cycles. Initial upswings in the cycle occur as food and raw materials become scarce. Historically, this has been followed by the discovery of new resource fields in "frontier" regions, which serves to reduce prices for commodities and produce a downswing in the Kondratieff cycle. Rostow argues that this is a primary reason for the growth in Sunbelt cities in the twentieth century. Since the South has been a net exporter of agricultural products, increases in food and energy prices in the 1970s spurred the growth of the region and led to the decline of the food and energy poor regions in the northern United States.

054. ———. 1956. The take-off into self-sustained growth. *The Economic Journal* 66, 261: 25-48.

Rostow discusses the three distinct periods of economic growth: (1) a long period in which the preconditions for growth are established; (2) the takeoff period, which refers to rapid growth that occurs within the span of a few decades; and (3) a long period of self-sustained growth. He focuses on the conditions that prepare and boost societies into the "takeoff" stage.

055. Schumpeter, Joseph. 1947. *Capitalism, socialism, and democracy*. New York: Harper.

056. ———. 1934. *The theory of economic development*. Cambridge, MA: Harvard University Press.

Schumpeter's work has had tremendous influence on many more modern theories of regional economic development, especially network theory and endogenous growth theory. His influence can also be seen in many "neo-Schumpeterian" approaches to economic development that have yet to take on a regional dimension and are thus not discussed in this review. In terms of regional economic development theory, Schumpeter is probably most well-known for his theories linking economic development to innovation. These ideas eventually become the basis for ideas developed by Arrow (1962) and Romer (1986) on endogenous growth theory. Schumpeter argues that traditional economic perspectives on economic development have been largely limited due to the inability of general equilibrium models to account for innovation. Instead, economic development follows a process that is largely path dependent and evolutionary. He describes the process of innovation as one of "creative destruction," where firms constantly search for new ways of doing business. In chapter 8 of the second book, Schumpeter argues that the process of innovation is largely a race for monopoly control over the stream of rents from new innovations.

057. Thompson, Wilbur R. 1968. *A preface to urban economics*. Baltimore, MD: Johns Hopkins University Press.

Chapter 1 presents a version of the stage theory of urban/regional economic growth that is criticized by Douglass North (1955). Accordingly, urban areas grow by progressing from an early stage in which the local economy is largely equated with a single large industry or firm through various phases of export-led growth until the export of services becomes a major function in the final stage. At some point during this development process, a "ratchet" effect occurs, where growth patterns become locked into place and future contraction becomes unlikely. While Thompson's work is usually not equated with the new economic geography, the concept of an urban ratchet is similar to the critical mass concept employed by Krugman (1991).

b) Profit/Product Cycle Theories

058. Markusen, Ann. 1985. *Profit cycles, oligopoly, and regional development*. Cambridge, MA: MIT Press.

Markusen's profit cycle theory is an attempt to offer an alternative to neoclassical supply-side and demand-side

theories of regional growth by emphasizing the role of sectoral dynamics and oligopolies in regional development and change.

059. Taylor, Michael. 1986. The product-cycle model: A critique. *Environment and Planning A* 18, 6: 751-61.

The author summarizes the product cycle and offers six different criticisms of the approach.

060. Vernon, Raymond. 1966. International investment and international trade in the product cycle. *Quarterly Journal of Economics* 80, 2: 190-207.

The product cycle approach to regional development is described.

061. Weinstein, Bernard L., Harold T. Gross, and John Rees. 1985. *Regional growth and decline in the United States*. New York: Praeger.

Chapters 2 and 5 give an overview of several theories of regional economic growth and decline that serve as a foundation for the empirical work performed in the remainder of this book. In chapter 5, the authors elaborate on a regional version of Vernon's product cycle hypothesis (1966) and rely on the theory to discuss regional development in the United States.

c) Industrial Restructuring Theories

062. Bluestone, Barry, and Bennett Harrison. 1982. *The deindustrialization of America*. New York: Basic Books.

The authors discuss how the internationalization of capital flows has resulted in the disinvestment in U.S. communities. This disinvestment has occurred through the cross-subsidization of new product development, the lack of new investment in depreciating fixed capital, the physical relocation of plants and equipment, or finally through the shutdown of entire plants (p. 7). This disinvestment in national productive capacity has in turn resulted in the destruction of social and community ties in many regions of the United States.

063. Danson, Michael W. 1982. The industrial structure and labor market segmentation: Urban and regional implications. *Regional Studies* 16, 4: 255-65.

Danson demonstrates how the emergence of a dualist industrial structure has been a primary cause of the stratification and segmentation of the labor market.

064. Fainstein, Susan S. 1996. The changing world economy and urban restructuring. In *Readings in urban theory*, Susan Fainstein and Scott Campbell, eds. Cambridge, MA: Blackwell.

Fainstein argues that there are two alternative paradigms for understanding cities. On one hand, cities can be viewed as components of an international political-economic "world system." A contrasting perspective is to view cities from the inside out, examining the political, economic, and social forces that make particular regions unique. Fainstein examines both paradigms in turn. When viewed from the

outside, cities are coming to terms with an increasingly dynamic global environment. In this new environment, the local business climate and access to local markets is becoming more important than access to raw materials. When viewed from the inside, differences in the extent of government entrepreneurship, the amount of local planning, the level of priority placed on those in need interact to determine the path that local policymakers will choose to foster economic development.

065. Harrison, Bennett. 1985. The tendency toward instability and inequality underlying the "revival" of the New England economy. In *Economic prospects for the Northeast*, Harry Richardson and Joseph Turek, eds. Philadelphia: Temple University Press.

This chapter examines how the shift from a manufacturing-based economy toward a high-tech economy in the New England region has affected workers. The author concludes that the restructuring has led to the disappearance of semiskilled jobs due to relocation by large industries and the "deskilling" of the labor force. The latter practice is cited as one means of lowering wage costs while increasing managerial control over the workforce.

066. Leigh, Nancy Green. 1994. *Stemming middle class decline: The challenges to economic development planning*. New Brunswick, NJ: Center for Urban Policy Research.

Leigh examines the shrinking relative size of the middle class from the late 1960s to the late 1980s by examining trends during this period in the proportion of workers making between 50 and 200 percent of median income. Essentially, she argues that the relative decline can be attributed to the relative increase in the number of upper income full-time workers. During this period, the relative size of the low-income group has remained relatively constant. However, since the cost of goods affordable to the middle class has risen substantially while nonwage employment benefits declined proportionately, middle-class standards of living have been increasingly more difficult to attain.

067. Massey, Doreen, and Richard Meegan. 1982. *The anatomy of job loss: The how, why, and where of employment decline*. London: Methuen.

This book examines the geography of employment decline and how firms use job elimination as a corporate strategy. The authors begin by examining three different corporate strategies that typically lead to job loss and then go on to discuss how regions are affected in different ways depending on the nature of the strategy leading to employment decline.

068. Moulart, Frank, Erik Swyngedouw, and Patricia Wilson. 1988. Spatial responses to Fordist and post-Fordist accumulation and regulation. *Papers of the Regional Science Association* 64: 11-23.

The authors present a review of the regional dimensions of post-Fordist industrial restructuring.

069. Noyelle, Thierry J., and Thomas M. Stanback Jr. 1983. *The economic transformation of American cities*. Totowa, NJ: Rowman and Allanheld.

This book contains an examination of the U.S. transformation to a service sector economy and its impact on metropolitan areas.

070. Sassen, Saskia. 1988. *The mobility of labor and capital: A study in international investment and labor flow*. Cambridge, CA: Cambridge University Press.

Sassen seeks to integrate previous theoretical and empirical perspectives on the mobility of labor and the mobility of capital in order to understand recent trends in immigration to the United States and the impact of these trends on U.S. cities. The internationalization of capitalist production, according to Sassen, has disrupted traditional labor structures. In the third world, direct foreign investment fostered the growth of export-led manufacturing industries. Frequent layoffs resulting from insecure manufacturing jobs have created a large supply of female migrant workers, many of whom were previously employed in the nonwage household sector. With the expansion of the service sector in the United States, many of the unemployed workers immigrated to new global cities such as Los Angeles and New York. The existence of significantly sized immigrant communities in these cities facilitated this labor mobility.

071. Storper, Michael, and Richard Walker. 1984. The spatial division of labor: Labor and the location of industries. In *Sunbelt/snowbelt: Urban development and regional restructuring*, Sawers, Larry and William K. Tabb, eds. New York: Oxford University Press.

The authors explore the importance of labor to the location decisions of industries.

d) Flexible Specialization and Network Theory

072. Cooke, Philip, and Kevin Morgan. 1993. The network paradigm: New departures in corporate and regional development. *Environment and Planning D: Society and Space* 11, 5: 543-64.

Cooke and Morgan provide a regional perspective on the literature surrounding network theory. As the authors point out, the network perspective on economic organization views decentralized networks as organizational alternatives that lie somewhere between Williamson's (1975) markets and hierarchies. Networks rely on locational proximity to reinforce trust relationships between those involved in economic exchange. The key features of a networked region are strong public and private industrial support institutions, channels for the rapid diffusion of technology, a high degree of interfirm interactions, and a critical mass of innovation-focused firms (p. 562). The authors apply the network perspective to examine four cases of intraregional interaction in Europe.

073. Dunn, Edgar S. 1970. A flow network image of urban structures. *Urban Studies* 7, 2: 239-58.

Dunn presents an early network perspective on urban structure by developing a typology of networks and examining the flow characteristics of each type.

074. Markusen, Ann R., Yong-Sook Lee, and Sean DiGiovanna, eds. 1999. *Second tier cities: Rapid growth beyond the metropolis*. Minneapolis: University of Minnesota Press.

This work examines the rapid growth of the new wave of "second-tier" cities, which the authors define as "spatially distinct areas of economic activity where a specialized set of trade-oriented industries takes root and flourishes, establishing employment and population-growth trajectories that are the envy of other places" (p. 3). Their theoretical approach is outlined in chapters 1 through 4. The authors extend the common conception of the flexibly specialized industrial district by emphasizing the role of large firms, state actors, local fixed capital, and the active recruitment of skilled labor in district formation. A major contribution of the book is to demonstrate how our traditional conception of the industrial district is much more complex than originally envisioned by Marshall (1890) and involves complex interactions both within and outside the region.

075. Piore, Michael J., and Charles F. Sabel. 1984. *The second industrial divide*. New York: Basic Books.

In this book, the authors discuss how crises in the 1970s led to the emergence of a new form of industrial organization, referred to as "flexible specialization." The authors point to the Marshallian industrial districts of Italy as one example of flexible specialization in action.

076. Porter, Michael E. 1990. *The competitive advantage of nations*. New York: Free Press.

This work addresses a topic of concern among economists since the days of Adam Smith and David Ricardo: "Why do some nations succeed and others fail in international competition?" (p. 1). Porter argues that there are four major determinants of national competitive advantage in a particular industry: (1) factor conditions; (2) local demand conditions; (3) related and supporting industries; and (4) firm strategy, structure, and rivalry (p. 71). Competitive advantage emerges from the "diamond" of these four forces, which may be catalyzed or diminished by chance or governmental intervention. Among factor conditions, basic factors such as natural resources, climate, and unskilled labor have become less important than specialized advanced factors such as communications infrastructure and highly educated workers. Often, scarcity in basic factors can even act to spur the emergence of certain advanced factors through innovation in response to resource scarcity. Local demand, when it is discriminating and anticipatory of buyers' needs internationally, prepares and pressures local firms to innovate, thus preparing them to meet the needs of export markets. The presence of local internationally competitive suppliers helps to spur innovations in related industries. Also, having a healthy supply

of local inputs helps to reduce transaction costs by facilitating frequent intrafirm interactions and information flows.

077. Saxenian, AnnaLee. 1994. *Regional advantage: Culture and competition in Silicon Valley and Route 128*. Cambridge, MA: Harvard University Press.

Saxenian compares the recent growth trajectories of Silicon Valley and Boston's route 128. While both were high-tech centers in electronics during the 1970s, only Silicon Valley emerged from a regional recession in the 1980s to become an international leader in the high-tech industry. This work examines the causes of these divergent growth trajectories and concludes that the differences have been primarily attributable to differences in the nature of industry structure within the two regions. Silicon Valley's industry was defined by dense social networks based on flexible specialization and entrepreneurship. In contrast, Route 128 was dominated by a small number of hierarchically integrated firms that valued secrecy and independence.

078. Scott, Allen J. 1992. The collective order of flexible production agglomerations: Lessons for local economic development policy and strategic choice. *Economic Geography* 68, 3: 219-33.

The author discusses the institutional dimension of flexibly specialized networks and asks, "What constitutes an optimal combination of competition and cooperation in modern flexible production agglomerations?" (p. 220). The explanation hinges on a departure from transaction cost theory, which views institutional arrangements as transaction-cost-minimizing devices. This theory views the optimal design of a network, or any form of organization, as a balance between the incentive mechanisms from competitive structures while minimizing the governance costs of large Fordist bureaucracies. Scott points to five types of networks that have been shown to be successful in performing this task: (1) the public provision of innovation centers, (2) collective institutions that facilitate the upgrading of labor skills (e.g., local universities, apprenticeship programs, and labor unions), (3) business associations that provide marketing and other business services to local business agglomerations, (4) just-in-time processing networks, and (5) local land use regulatory institutions.

079. Storper, Michael. 1997. *The regional world: Territorial development in a global economy*. New York: Guilford.

This edited volume of Storper's works gives an overview of recent work on regionalism. Storper argues that the region is the locus of "untraded interdependencies, which take the form of conventions, informal rules, and habits that coordinate economic actors under conditions of uncertainty" (p. 5). The author builds on earlier works in the network theory tradition by examining the specific institutional arrangements that sustain and facilitate the growth of network-based regional economies. Throughout this work, he argues that capitalist development is a dynamic process of introducing variety to facilitate knowledge sharing and eliminating variety to reduce costs (p.

290). In the development of his theoretical perspective, Storper draws on organization theory and economics to expand on the traditional ideas formulation by network theorists.

e) Marxist Theory

080. Castells, Manuel. 1972. *The urban question*. London: Edward Arnold.

Castells presents an overview of the Marxist perspective on urban and regional development by pointing to recent empirical data on urbanization in the industrialized world and the developing world. In chapter 2, he argues that the emergence of large metropolitan regions in the United States and France is the combined result of the monopolistic concentration of capital and the functional separation of large units of production. In chapter 3, Castells examines the underdevelopment of particular world regions and argues against the perspective that views urbanization as a "mechanical consequence of economic growth, and, in particular, of industrialization" (p. 40). Instead, Castells argues that underdeveloped regions have experienced fundamentally different growth histories than industrialized regions. The modern problem of underdevelopment can only be understood in terms of the historical development of the capitalist mode of production.

081. Edel, Matthew. 1996. Urban and Regional Economics—Marxist Perspectives. In *Regional and urban economics*, Pt. 2, Richard Arnott, ed. Amsterdam: Harwood.

This article provides a comprehensive overview of the Marxist perspective in urban and regional economics.

082. Friedmann, John. 1979. On the contradictions between city and countryside. In *Spatial inequalities and regional development*, Hendrik Folmer and Jan Oosterhaven, eds. Boston: Martinus Nijhoff.

Friedmann applies the Marxist perspective in an examination of the relationship between urbanized areas and rural areas. He examines this relationship as a contradiction between opposing, but potentially complementary, social forces. For Friedmann, the contradictions between the city and the countryside are fundamentally contradictions between functional (interest-based) forms of social integration and territorial (geographic and historical) forms of social integration.

083. Goodman, Robert. 1979. *The last entrepreneurs: America's regional wars for jobs and dollars*. New York: Simon & Schuster.

The author draws on a Marxian perspective to describe how businesses have managed to maintain a "reserve army" of low-paid and unemployed workers that have been exploited for the purposes of imposing discipline on existing high-wage workers. Goodman argues that recent trends in business location within U.S. regions resemble a pattern similar to crop rotation. By threatening to relocate to other regions, businesses have created more favorable conditions for themselves.

084. Gordon, David M. 1977. Class struggle and the stages of American urban development. In *The rise of the Sunbelt cities*, David C. Perry and Alfred J. Watkins, eds. Beverly Hills, CA: Sage.

In a traditional Marxist perspective on the emergence of Sunbelt cities in the United States, Gordon begins by casting the neoclassical concept of efficiency in Marxist terms. At any given time in history, a production process can be either quantitatively efficient or qualitatively efficient. The former refers to creating the largest output from the least costly inputs, whereas the latter refers to the reproduction of class relations specific to a particular mode of production (p. 58). Initially, capitalists searched for quantitatively efficient processes, but those most likely to survive became those that facilitated maximum control over workers and were thus qualitatively efficient. Applying this concept to cities, Gordon defines three stages of capital accumulation that have produced specific patterns of urban development, which Gordon refers to as the commercial city, the industrial city, and the corporate city. The struggle between owners and workers over the ownership of production and the underlying contradictions of capitalist accumulation act to propel cities from one stage to the next. New Sunbelt cities have developed a spatial structure that facilitates the most qualitatively efficient form of worker control in the current stage of capitalism. By moving to Greenfield areas in the Sunbelt, capitalists could escape entrenched central city labor unions and establish new forms of worker control in the Sunbelt suburbs.

085. ———. 1971. General perspectives . . . radical, liberal, and conservative. In *Problems in political economy: An urban perspective*, David M. Gordon, ed. Lexington, MA: D. C. Heath.

In this edited volume of works on urban political economy, David Gordon outlines the features of the "radical" Marxist perspective for analyzing urban political economies. The Marxist perspective examines urban and regional economic change as resulting from the historical evolution in a society's dominant mode of economic production (p. 3). Social change is viewed in terms of the inherent conflicts between the capitalist class and the worker class. In this view, the modern state is viewed as an instrument of capitalist accumulation rather than a potential source of labor reform, as in the liberal view.

086. Harvey, David. 1985. *The urbanization of capital*. Baltimore: Johns Hopkins University Press.

Harvey was one of the early authors to introduce Marx to regional development studies. Chapter 1 provides a description of the primary, secondary, and tertiary flows of capital. The primary circuit refers to the production of surplus value within any given time period. The secondary circuit refers to the production of surplus value during several periods through investments in fixed capital and the consumption fund. The fixed nature of secondary circuit investments is of central importance to Harvey, because these investments by definition are much more difficult to

adjust within any given time period. Broadly speaking, flows of capital will tend toward overaccumulation in the primary circuit and underaccumulation in the secondary circuit due to the difficulty of capturing all value associated with the latter. State and financial institutions emerge as intermediaries to facilitate the flow of capital from the primary to the secondary circuit. The final tertiary circuit refers to the flow of investments in science, technology, and human capital. Like flows in the secondary circuit, capitalists tend to underinvest in this circuit without intermediation by the state.

087. Holland, Stuart. 1979. Capital, labor and the regions: Aspects of economic, social and political inequality in regional theory and policy. In *Spatial inequalities and regional development*, Hendrik Folmer and Jan Oosterhaven, eds. Boston: Martinus Nijhoff.

This chapter is an elaboration of the author's earlier work using a diagrammatic approach.

088. ———. 1976. *Capital versus the regions*. London: Macmillan.

Holland critiques the existing state of regional development theory and presents the Marxian "Imbalance" theory as an alternative perspective. The basic arguments of this perspective are laid out in chapter 2 of this book; chapter 1 considers alternative perspectives, and chapters 3 through 8 elaborate on the ideas developed in chapter 2.

089. Markusen, Ann. 1987. *Regions: The economics and politics of territory*. Totowa, NJ: Rowman and Littlefield.

This book is a companion work to Markusen's *Profit Cycles* (1985). Here, she focuses on the political dimensions of regional development in the United States. In chapters 1 through 3, Markusen argues that U.S. regionalism has emerged primarily from economic differentiation created by the uneven spread of capitalism. This has in turn been reinforced by the U.S. federal system of government. Much of the work focuses on the factors that give rise to regional political conflicts. The author also elaborates on the political thesis, however, by examining how politics, in turn, affect regional growth. Regional politics may foster a region's integration into the larger capitalist system or it may foster a divergent path.

090. Massey, Doreen. 1984. *Spatial divisions of labour: Social structures and the geography of production*. London: Macmillan.

The author uses a Marxist perspective to explore the link between the spatial organization of capitalism and the social division of labor. Massey's basic argument is that distance and spatial differentiation are strategic devices employed by capitalists to facilitate capital accumulation. The use of spatial strategies to take advantage of the labor force's differentiation results in patterns of uneven development across regions (chap. 3). In chapters 2 and 3, Massey examines three types of spatial organization to determine how each affects (and is affected by) different

patterns of regional social relations. In chapters 4 through 6, Massey examines how this *spatial division of labor* has evolved and affected particular groups differentially in the United Kingdom since the 1960s.

091. *The Review of Radical Political Economics*. 1978. Special issue on "Uneven Regional Development" 10, 3.

Several articles in this issue provide an overview of the key arguments from the Marxist perspective on regional economic development.

092. Smith, Neil. 1984. *Uneven development*. Oxford: Basil Blackwell.

Chapter 5 of this work establishes a theory of uneven development. Smith develops a view of urban development that is based on the seesaw process of investment and disinvestment at different spatial scales. The most pronounced scale is the urban environment, whose rent value is manipulated, according to Smith, to ensure capitalist accumulation. In contrast to the neoclassical economic view, which sees development as progressing toward equalization, Smith sees this tendency as an inherent paradox in capitalism that does not produce even patterns of development but instead produces seesawing waves of development and underdevelopment. As urban areas are developed to accumulate profits, their values rise. However, due to the spatial fixity of the investments and the increased competition from new entrants, these profits are unstable. Once profits begin to fall, areas are completely abandoned for new locations in the search for profits.

093. Watkins, Alfred J., and David C. Perry. 1977. Regional change and the impact of uneven urban development. In *The rise of the Sunbelt cities*, David C. Perry and Alfred J. Watkins, eds. Beverly Hills, CA: Sage.

The authors summarize some of the major theoretical perspectives on the recent emergence of rapidly growing Sunbelt cities along the U.S. southern perimeter. Emergent cities such as those in the Sunbelt grow by enacting barriers that limit the growth of smaller cities, thereby facilitating capital accumulation. However, as industrial structure evolves from one epoch to another, the barriers erected by growing capitalist cities become inflexible and may act to repel new emergent industries that no longer benefit from the barriers erected during previous epochs.

4. POLITICAL INSTITUTIONS AND REGIONAL ECONOMIC DEVELOPMENT

a) Growth Machine Theory

094. Cronon, William. 1991. *Nature's metropolis: Chicago and the great American West*. New York: Norton.

Cronon discusses the role of boosterism and "frontier economics" in the development of the city of Chicago. Chapter 1 innovatively ties the theories of boosterism to theories of natural advantages and resource endowments to discuss how natural resources and land interact with booster ideals to produce city growth.

095. Logan, John, and Harvey Molotch. 1987. *Urban fortunes*. Berkeley: University of California Press.

In chapter 3 of this work, the authors elaborate on the growth machine concept originally developed by Molotch. The impact of the "growth ethic" on various community institutions is examined. The authors also present a historical analysis of the development of growth machines in America. The evolution of growth machines and the uneven distribution of growth are discussed.

096. Logan, John R., Rachel Bridges Whaley, and Kyle Crowder. 1999. The character and consequences of growth machines: An assessment of twenty years of research. In *The urban growth machine: Critical perspectives, two decades later*, Andrew E. G. Jonas and David Wilson, eds. Albany: State University of New York Press.

This review is particularly useful, because it links growth machines to economic outcomes. If the growth machine perspective is to be a useful contribution to the theory of regional economic development, then growth machines must have an impact on the interregional distribution of economic activities. The authors conclude that while the impact of pro-growth policies is mixed, growth-control policies do not seem to significantly affect population growth rates. This suggests that the growth machine perspective is a more useful theory of why political coalitions form than a theory of how growth coalitions affect regional economic outcomes.

097. Molotch, Harvey. 1976. The city as growth machine: Toward a political economy of place. *American Journal of Sociology* 82, 2: 309-32.

This classic article establishes the basic propositions of the growth machine perspective. Simply put, this theory argues that coalitions of political and economic elites work to mobilize the regional population toward strategies that promote, rather than discourage, regional economic growth and development.

098. Wolman, Harold. 1996. The politics of local economic development. *Economic Development Quarterly* 10, 2: 115-50.

The politics of local economic development policy making are examined, and recent research related to the growth machine and other related perspectives are reviewed.

b) The New Institutional Economics

099. Coase, Ronald H. 1937. The nature of the firm. *Economica* 4, 16: 386-405.

This classic in the field of institutional economics is not about regional development theory per se, but Coase's views of the nature of the firm have proved to be fundamental in shaping the future work of seminal authors in this perspective. The essence of Coase's argument is that various forms of internal economic organization can be traced to the desire among owners to minimize the transaction costs of production. For transactions that involve substantial uncertainties and for which contractual monitor-

ing costs are prohibitively high, vertically integrated nonmarket institutions may have cost savings over market forms of organization.

100. Eggertsson, Thrainn. 1990. *Economic behavior and institutions*. Cambridge, UK: Cambridge University Press.

An excellent introduction to the literature known as the new institutional economics. This exposition is particularly useful because it focuses on the relationship between institutional change and economic development.

101. North, Douglass C. 1991. Institutions. *Journal of Economic Perspectives* 5, 1: 97-112.

In this essay, North elaborates on the role of institutions in economic development. Institutions, according to North, serve to reduce the transaction costs associated with engaging in economic exchange by increasing the social benefits of long-term cooperation. The institutions of capitalism have grown increasingly more complex due to the increasing complexity of economic exchanges. Institutional adaptation may either promote or discourage economic development. If the institutions that evolve are incompatible with the transaction cost demands of private investors, then a region may not grow. For example, if the property rights structure of a society does not recognize private contracts among economic agents, informal forms of governance may emerge to facilitate the capture of short-term profits among established elites while also serving to exclude outside investors. Similarly, large vertically integrated firms may emerge to monitor wage labor if contracts with external suppliers are not recognized.

102. ———. 1990. *Institutions, institutional change, and economic performance*. Cambridge, UK: Cambridge University Press.

North applies the insights of Williamson (1975, 1985) and Coase (1937) to propose a theory of economic development that is based on institutional adaptation and change. The essence of his argument is that political and economic institutions emerge primarily to resolve transaction cost dilemmas. The institutions that emerge establish the "rules of the game" for economic exchange and determine the expected private returns from investments in the local economy.

103. Williamson, Oliver E. 1985. *The economic institutions of capitalism*. New York: Free Press.

104. ———. 1975. *Markets and hierarchies: Analysis and antitrust implications*. New York: Free Press.

Williamson's work reintroduced the ideas of Coase (1937) to a more recent generation of scholars and formalized the concept of "transaction costs." In these two seminal works, Williamson argues that transactions arise from one of two sources: bounded rationality and opportunistic behavior of contractual agents. Furthermore, these conditions become more problematic for exchange relationships when parties to an exchange use specific assets whose value is limited outside the scope of the immediate exchange relationship. Williamson establishes a typology

of organizational forms ranging from market to hierarchy that correspond to particular transaction cost dilemmas.

5. EMERGING NEOCLASSICAL PERSPECTIVES

a) Endogenous Growth Theory

105. *Annals of Regional Science* 1998, 32, 1.

A special symposium on regional endogenous growth theory.

106. Arrow, Kenneth J. 1962. The economic implications of learning by doing. *Review of Economic Studies* 29, 3: 155-73.

Arrow was the first to point out that production costs may decline over time as firms gain experience in the production process. Romer (1986) later relies on this concept of "learning by doing" to develop an economic growth model with endogenous technical change.

107. Aschauer, David Alan. 2000. Do states optimize? Public capital and economic growth. *Annals of Regional Science* 34, 3: 343-63.

An extension of Barro's (1990) endogenous growth model with public capital investment. An empirical test of the model using data from states within the United States from 1970 to 1990 suggests that there is a positive nonlinear relationship between public capital investment and economic growth.

108. Barro, Robert J. 1990. Government spending in a simple model of endogenous growth. *Journal of Political Economy* 98, 5: S103-25.

This article develops an endogenous growth model that incorporates tax-financed public services. With a Cobb-Douglas production function, there is a nonlinear relationship between public investment and private output. Increases in government spending raise the marginal productivity of capital and labor, assuming a small to moderate ratio of government spending to total output. If this ratio becomes too large, the distortional effects of taxation predominate and lead to a declining growth rate.

109. Button, Kenneth. 1998. Infrastructure investment, endogenous growth, and economic convergence. *Annals of Regional Science* 32, 1: 145-62.

This article provides a review of evidence linking public infrastructure investment to regional economic growth. The author concludes that the evidence supporting this link at the regional scale is still far from conclusive, suggesting that policy prescriptions based on these studies may be premature.

110. Cass, David. 1965. Optimum growth in an aggregative model of capital accumulation. *Review of Economic Studies* 32, 3: 233-40.

Cass and Koopmans (1965), using an intertemporal utility function proposed by Ramsey (1928), incorporate a variable savings rate into the Solow-Swan model of economic growth. The incorporation of a savings rate that is deter-

mined by household choice places the Ramsey-Cass-Koopmans model in the class of more recent endogenous growth models that allow growth parameters to be determined inside the model. Under certain conditions, the model predicts conditional convergence over time. If the savings rate rises with the capital/labor ratio, then the model predicts a slower speed of convergence than the Solow-Swan model (Barro and Sala-i-Martin 1999).

111. Glaeser, Edward L., Hedi D. Kallal, Jose A. Scheinkman, and Andrei Shleifer. 1992. Growth in cities. *Journal of Political Economy* 100, 6: 1126-52.

Although this is primarily an empirical work, it succinctly compares and contrasts three paradigms for the generation of knowledge and ideas in cities. One is the traditional Schumpeterian (1947) view, which has come to predominate the endogenous growth literature. In this view, concentrations of similar firms within the same industry help the industry, and hence, the city grow, due to the internalization of knowledge spillovers. Another view is that advocated by network theorists, such as Michael Porter (1990), who view intense competition by the same firms within a local industry as the primary engine of economic growth. Finally, the view of Jacobs (1969) is somewhat of an anomaly in that she argues that the diversity of many firms in different industries helps to facilitate the transmission of complementary innovations across industries. Glaeser et al. test each of these three theories and find that local competition and urban variety rather than regional industrial specialization contribute to employment growth, thus supporting Jacob's views of endogenous growth generation.

112. Jacobs, Jane. 1969. *The economy of cities*. New York: Vintage Books.

Although Jacobs is rarely aligned with the formalist practitioners of endogenous growth theory, her ideas on the role of cities as a source of knowledge generation fits nicely within the tradition of endogenous growth theory. In this classic text, Jacobs argues that the diversity of the urban economy is an endogenous source of innovation and knowledge transfer. Unlike other authors, particularly Schumpeter (1947), who point to the role of large monopolies in spurring innovation, Jacobs argues the opposite. Instead, local competition serves as a catalyst to technology adoption and diffusion. In this sense, Jacobs focuses on the role of Hoover's (1937) urbanization economies as the engine of growth.

113. Koopmans, Tjalling C. 1965. On the concept of optimal economic growth. In *The econometric approach to development planning*. Pontificae Academiae Scientiarum Scripta Varia No. 28. Amsterdam: North Holland.

114. Martin, Ron, and Peter Sunley. 1998. Slow convergence? The new endogenous growth theory and regional development. *Economic Geography* 74, 3: 201-27.

The authors of this article provide an overview of endogenous growth theory and its applicability to theories of

regional economic growth and the convergence of regional per capita incomes and output. The authors begin by reviewing recent literature that suggests that regional convergence is slower and more discontinuous than theory might suggest. The usefulness of endogenous growth theory to explain these empirical findings is discussed. Although endogenous growth theory is seen as a welcome innovation in regional growth studies, the approach is criticized for its overemphasis on formalism and ignorance of socioeconomic institutions.

115. Nijkamp, Peter, and Jacques Poot. 1998. Spatial perspectives on new theories of economic growth. *The Annals of Regional Science* 32, 1: 7-37.

This article gives a comprehensive overview of neoclassical growth theory, including its exogenous and endogenous technical change, and explores how to incorporate endogenous technical change into a regional growth model. When spatial interactions across regions are incorporated into their regional endogenous growth model, the empirical implications of the model are indeterminate. Depending on the specification of the model, absolute convergence, conditional convergence, and divergence are all theoretical possibilities.

116. Ramsey, Frank. 1928. A mathematical theory of saving. *Economic Journal* 38, 152: 543-59.

Barro and Sala-i-Martin (1999) point to Ramsey (1928) as the starting point for modern economic growth theory. The key contribution of Ramsey's work is the development of an intertemporally separable utility function. This development allows for the incorporation of a variable savings rate into the Solow-Swan model, which assumes a constant savings rate over time.

117. Richardson, Harry W. 1973. *Regional growth theory*. London: Macmillan.

Although Richardson is usually not credited with contributing to the endogenous growth literature, his reduced form model of regional growth allows for endogenous technical change. Unlike endogenous growth models, his model incorporates agglomeration economies and other spatial factors.

118. Romer, Paul M. 1986. Increasing returns and long-run growth. *Journal of Political Economy* 98, 5: 71-102.

Romer extends the "learning-by-doing" model, proposed by Arrow (1962), to examine endogenous technical change within a competitive general equilibrium model.

b) The New Economic Geography

119. Dixit, Avinash K., and Joseph E. Stiglitz. 1977. Monopolistic competition and optimum product diversity. *American Economic Review* 67, 3: 297-308.

This general equilibrium model of monopolistic competition provides the foundation for later models in the new economic geography as well as more recent models in the new growth theory literature. Essentially, the Dixit-Stiglitz

- model, like the Romer model (1986) discussed in the endogenous growth theory literature, allows increasing returns to be incorporated into a general equilibrium framework in a manner that is mathematically tractable.
120. Fan, Wei, Frederick Treyz, and George Treyz. 2000. An evolutionary new economic geography model. *Journal of Regional Science* 40, 4: 671-95.
- In this article, the authors present a generalized version of the new economic geography model that allows for worker mobility across regions and sectors, introduces a more prominent role for land use, and provides a more realistic model of geographic space that allows for multiple regions in one or two dimensions. The authors demonstrate the usefulness of the model in evaluating policy prescriptions with an example based on transportation cost reductions. As transportation costs decrease, industries that use a large number of intermediate inputs relative to land tend to cluster together.
121. Fujita, Masahisa, Paul Krugman, and Anthony J. Venables. 1999. *The spatial economy: Cities, regions, and international trade*. Cambridge, MA: MIT Press.
- This book, a more formal exposition of the ideas originally developed in Krugman (1991), also gives an overview of the theoretical and empirical literature on which the new economy geography is based.
122. Glaeser, Edward L. 1994. Cities, information, and economic growth. *Cityscape: A Journal of Policy Development Research* 1, 1: 9-48.
- This article provides an excellent discussion of the importance of information to the growth and development of cities. Since the literature reviewed by Glaeser spans both the new endogenous growth theories and the new economic geography, the article provides a useful framework for thinking about linkages between these two bodies of theory.
123. Henderson, J. Vernon. 1996. Ways to think about urban concentration: Neoclassical urban systems versus the new economic geography. *International Regional Science Review* 19, 1-2: 31-36.
- This brief article compares the new economic geography to Henderson's urban systems approach.
124. *International Regional Science Review* 22, 2: 1999.
125. Krugman, Paul. 1999. The role of geography in development. *International Regional Science Review* 22, 2: 142-61.
- Several articles from the World Bank's Tenth Annual Bank Conference on Development Economics are presented in this special issue. The article by Krugman suggests that recent models examining the role of geography in the economic development process have generally taken one of two approaches. The "predestination" approach explicitly considers the role of geographic factors such as climate and topography in determining patterns of regional growth and decline. The "self-organizing" approach asks why regional economies experience such different patterns of economic growth when there are no apparent geographic differences between regions. Krugman concludes by discussing why it is often so difficult to draw policy prescriptions from models linking geography and development. For new economic geographers, the primary difficulty lies in the fact that the models are highly stylized versions of reality with outcomes that are very sensitive to alternative assumptions and model specifications.
126. ———. 1991. *Geography and trade*. Cambridge, MA: MIT Press.
- The basics of the new economic geography are presented in an easy-to-read narrative framework that is based on several lectures given by Krugman on the topic. Krugman also examines other models and emphasizes the importance of labor pooling and proximity to intermediate good suppliers on the emergence of regional clusters.
127. Neary, J. Peter. 2001. Of hype and hyperbolas: Introducing the new economic geography. *Journal of Economic Literature* 39, 2: 536-61.
- A review of the theoretical and empirical literature surrounding the new economic geography. This article concludes with a discussion of policy implications and issues related to empirical testing of the new economic geography.
128. Pred, Allan. 1966. *The spatial dynamics of U.S. urban-industrial growth*. Cambridge, MA: MIT Press.
- In chapter 2, Pred combines the export base concept with the cumulative causation argument to demonstrate how the export base multiplier may expand along with regional growth (Fujita et al. 1999).
6. CONCLUSION: TOWARD AN INTEGRATED THEORY OF REGIONAL ECONOMIC DEVELOPMENT
129. Acs, Zoltan J., and Attila Varga. 2002. Geography, endogenous growth, and innovation. *International Regional Science Review* 25, 1: 132-48.
- The authors survey the new economic geography, endogenous growth theory, and the literature surrounding the economics of innovation. They argue that the new economic geography provides an explanation for the spatial component of regional growth, but its consideration of innovation processes is incomplete. Similarly, endogenous growth theory provides an explanation for regional growth, but until recently, has tended to ignore spatial considerations and institutions. Finally, the economics of innovation give an account of the innovation process without examining economic growth or space. The authors conclude that a "technology-led" theory of regional growth and decline requires elements from all of these perspectives.
130. Bretschger, Lucas. 1999. Knowledge diffusion and the development of regions. *Annals of Regional Science* 33, 3: 251-68.

The author presents a model that integrates elements of endogenous growth theory, new economic geography, and traditional location theory into a model that demonstrates the long-term impact of intra- and interregional knowledge diffusion on regional growth trajectories. Knowledge diffusion becomes more important as interregional trade increases. Furthermore, regional economies become more likely to diverge over time as knowledge diffuses faster within regions than across regions.

131. Fujita, Masahisa, and Tomoya Mori. 1998. On the dynamics of frontier economies: Endogenous growth or the self-organization of a dissipative system? *Annals of Regional Science* 32, 1: 39-62.

Provides an account of the "Asia Miracle" using concepts from the new economic geography and endogenous growth theory.

132. Harrington, James W., and Deron Ferguson. 2001. Social processes and regional economic development. In *Theories of endogenous regional growth: Lessons for regional policies*, Borje Johansson and Charlie Karlsson, eds. Berlin: Springer-Verlag.

133. Johansson, Borje, and Charlie Karlsson. 2001. *Theories of endogenous regional growth: Lessons for regional policies*. Berlin: Springer-Verlag.

134. Stough, Roger R. 2001. Endogenous growth theory and the role of institutions in regional economic development. In *Theories of endogenous regional growth: Lessons for regional policies*, Borje Johansson and Charlie Karlsson, eds. Berlin: Springer-Verlag.

The edited volume by Johansson and Karlsson (2001) discusses ways to extend endogenous regional growth theory to account for the role of institutions in regional growth. Stough examines the connection between leadership and regional growth for a sample of U.S. metropolitan areas. Harrington and Ferguson place the new institutional economics into an endogenous growth context. Both of these authors, along with several others in this volume, emphasize the ways in which formal and informal institutions structure patterns of innovation and economic growth.

D. Theoretical Perspectives on the Role of Regional Development Planning and Policy

135. Alonso, William. 1968. Urban and regional imbalances in economic development. In *Regional policy: Readings in theory and applications*, John Friedmann and William Alonso, eds. Cambridge, MA: MIT Press.

Alonso compares the two seemingly competing objectives of regional policy, efficiency and equity, to determine if policymakers can have their cake and eat it too. He argues that if we adopt the assumption of diminishing returns to scale, the answer is easy: if larger cities grow beyond their minimum efficient size, then redistribution from leading to lagging regions is justified on both efficiency and equity grounds. Alonso concludes that this approach is unwar-

ranted, because there may be increasing returns to city size. He does not abandon the idea of the possibility of satisfying efficiency and equity criteria, however. Although regional inequalities may exist in the early stages of a nation's development, trickle-down effects should theoretically reduce interregional disparities in the long run. Thus, a strategy focused on urbanization may eventually achieve both efficiency and equity objectives in the long run. Given that it is much more difficult to quantify equity than efficiency, Alonso is less optimistic about the reverse policy of focusing first on equity in the hopes that efficiencies will be realized in the long run.

136. Bartik, Timothy J. 1991. *Who benefits from state and local economic development policies?* Kalamazoo, MI: Upjohn Institute.

137. ———. 1990. The market failure approach to regional economic development. *Economic Development Quarterly* 4, 4: 361-70.

Bartik's works examine the social welfare impacts of economic development policies. A key contribution is to demonstrate how the *rate* of growth may affect social welfare.

138. Bolton, Roger E. 1992. Place prosperity versus people prosperity revisited: An old issue with a new angle. *Urban Studies* 29, 2: 185-203.

In this classic essay, Bolton reexamines the people-versus-place debate first initiated by Louis Winnick (1966).

139. Friedmann, John, and Clyde Weaver. 1979. *Territory and function: The evolution of regional planning*. Berkeley: University of California Press.

An overview of the development of early regional planning doctrine within the United States, paying particular attention to the "polarized development" perspective on regional growth.

140. Hansen, Niles M. 1965. Unbalanced growth and regional development. *Western Economic Journal* 4, 1: 3-14.

Hansen elaborates on, and formalizes, many of the arguments initially made by Hirschman (1958) and Perroux (1950). In particular, he expands on Hirschman's concepts of directly productive activities and overhead capital to develop a framework for determining the nature and timing of regional improvements in infrastructure. Hansen argues that the impact of new investments on future development varies according to the existing level of development in a region. In "congested" regions with high levels of productive activity compared to the level of infrastructure, the region may require investments targeted at specific congestion problems without general expansions of the entire infrastructure network. In "intermediate" regions with high resource potential but deficiencies of core infrastructure, policy may demand across the board expansions of transportation, communications, and power infrastructure. Finally, "lagging" regions with a shortage of physical and human capital would most likely benefit from investments in social services such as health care and education

in preparation for the eventual expansion of productive capacity (Guild 2000).

141. Isserman, Andrew. 1995. State development policy and practice in the United States of America. *International Regional Science Review* 16, 1-2: 49-100.

Isserman examines the literature on state economic development programs to determine their form and impacts.

142. Massey, Doreen. 1979. In what sense a regional problem? *Regional Studies* 13, 2: 233-43.

In this article, Massey challenges the common conception of regional inequality by arguing that the problem is not purely geographic. Rather, it is a problem related to the spatial division of labor discussed in her book with the same name. Massey discusses regional inequality as it relates to the relative attractiveness of different regions for economic activity. This relative attractiveness results in inter- and intrasectoral differentiation, with the more recent changes occurring within the latter, as industry has sought to separate itself from unionized labor forces in older industrial cities. The implications of her arguments are many. First of all, regional inequality is an issue of the differentiation in production, of which geographic differentiation is but one of many means. Second, trends toward the convergence or divergence of interregional equality measures should be viewed in light of the historical structural changes in the evolution of capitalist production. Current sources of differentiation only became possible through previous structural shifts. Moreover, convergence does not necessarily imply an end to regional inequality. Instead, the underlying nature of regional inequality itself may be changing (p. 241). Finally, the implications for regional policy are that issues of regional inequality cannot simply be addressed by shifting industries around. Instead, policy must focus on the nature of production itself and not simply the spatial or sectoral distribution of production.

143. Noyelle, Thierry J. 1983. The rise of advanced services: Some implications for economic development in U.S. cities. *Journal of the American Planning Association* 49, 3: 280-90.

This article discusses the economic development policy implications of the findings from Noyelle and Stanback's (1983) *The Economic Transformation of American Cities*. An important point made by Noyelle is that "services" are by no means a homogeneous category confined to consumer-oriented services. In fact, much of the recent shift toward a service-based economy in many U.S. regions can be attributed to the rise of services that complement manufacturing production. Advertising is offered as an example. Noyelle also argues that some cities have grown advanced service-based export economies, while other cities have emerged primarily to serve home markets and/or outside metropolitan areas. The central issue for economic development planners is how to promote the growth of an advanced export service sector in these latter "dependent" metropolitan areas. Regarding the appropriateness of particular

economic development policy instruments, Noyelle offers two suggestions: (1) the appropriate instruments will vary with the nature of the metropolitan area and the relative maturity of its advanced service sector, and (2) given the dependence of the service sector on the manufacturing sector, an emphasis on the growth of a vital service sector need not necessarily be a substitute for a policy focusing on manufacturing jobs. The main point, however, is that the service sector should not be overlooked as a potential engine for metropolitan growth.

144. Oates, Wallace E., and Robert M. Schwab. 1988. Economic competition among jurisdictions: Efficiency enhancing or distortion inducing? *Journal of Public Economics* 35, 3: 333-54.

The authors examine the relative efficiencies of local government competition for new industry. By setting a tax rate on mobile capital and a standard for environmental quality, local governments induce new industries to enter their jurisdictions for the purpose of raising wages. The primary result of their analysis is that for homogeneous labor populations, jurisdictions choosing these policies under majority rule will choose zero tax rates on capital and standards that equate marginal benefits with the marginal costs of environmental quality. Distortions arise when the population is not homogeneous or when there are incentives to set positive tax rates on capital. These distortional possibilities are not trivial given the environment-versus-jobs debates that are common in many local communities.

145. Richardson, Harry W. 1979. Aggregate efficiency and interregional equity. In *Spatial inequalities and regional development*, Hendrik Folmer and Jan Oosterhaven, eds. Boston: Martinus Nijhoff.

Richardson gives an overview of the efficiency-versus-equity debate in regional planning. After reviewing the major issues surrounding this debate, this article examines several cases when the two goals may be compatible.

146. Stiglitz, Joseph E. 1989. Markets, market failures, and development. *American Economic Review* 79, 2: 197-203.

Stiglitz presents a review of recent thinking in the economics of information to identify several market failure explanations for the underdevelopment of third world nations. The market failures examined by Stiglitz are primarily those having to do with costly and imperfect information. With imperfect information, an innovator may gain monopoly profits following an innovation even though knowledge is a public good, since knowledge spillovers may be imperfect. Furthermore, if learning and technological change are highly localized, then the spillover benefits of knowledge creation may not extend beyond the borders of the innovating nation. Unfortunately, as Stiglitz argues, the nonmarket institutions that have emerged to combat these issues in many less-developed nations have been similarly inefficient in creating and internalizing the benefits of knowledge creation and diffusion. This is primarily due to the fact that governments face the same information

problems faced by private actors. Stiglitz concludes by suggesting that governments be more selective when choosing forms of nonmarket intervention to spur development.

147. Stohr, Walter, and Franz Todtling. 1979. Spatial equity: Some anti-theses to current regional development doctrine. In *Spatial inequalities and regional development*, Hendrik Folmer and Jan Oosterhaven, eds. Boston: Martinus Nijhoff.

Stohr and Todtling examine why regional policies geared toward improving regional and interregional inequities have been largely unsuccessful. The authors attribute part of the problem to the inadequacy of existing theory to inform regional development practice. In the field, economic development practice has been impaired by the overreliance on vertically integrated organizations and firms in the implementation of development policy, an overemphasis on market-oriented processes and formal institutional supports, and an overemphasis on material needs versus nonmaterial needs. The authors propose instead a policy of "selective spatial closure" (p. 153). This type of policy would imply "regional co-determination" as a strategy for insulating regions from external demand fluctuations. Examples include the communal control of natural resources and the introduction of "regionally adequate" technology (p. 154). On the demand side, Stohr and Todtling advocate policies that foster the emergence of diverse and differentiated preferences. Finally, they advocate policies designed to improve access from hinterland areas to core areas and other tax and subsidy measures that compensate for differential levels of intraregional accessibility.

148. Thompson, Wilbur R. 1975. The national system of cities as an object of public policy. In *Regional policy: Readings in theory and applications*, John Friedmann and William Alonso, eds. Cambridge, MA: MIT Press.

Thompson examines the role of cities in national policy making from the perspective of city size. On the one hand, while the scale economy benefits of size are U-shaped, the benefits of diversity may grow without bound. Furthermore, high-income persons may benefit more from consumer variety vis-à-vis cost reduction relative to low-income persons, so increased city size may disproportionately benefit upper-income persons. From a policy perspective, Thompson's primary interest is the issue of migration. Given the costs and benefits of city size and given the types of people most likely to migrate from smaller cities to another, when should we justify migration from urban to rural areas or vice versa as a policy goal? Regarding this issue, Thompson argues that if a place of outmigration is in a state of diminishing returns and the place of immigration in a state of increasing returns, then migration from the former to the latter is clearly justified. The more difficult issue is whether to justify migration from moderately small towns to very large cities. Those left behind in the small city may face lower product diversity

and higher costs in goods and services subject to economies of scale, whereas cities may face increased congestion and pollution with immigration. In this case, Thompson argues that the social costs of leaving small towns for large urban areas are understated relative to social costs (p. 532). Regarding the growth pole strategy, Thompson argues that diverting growth toward small *potential* urban centers risks the possibility that these areas may not develop into vibrant centers, thus leaving those new migrants worse off and no one better off. Furthermore, if the potential urban centers are already growing at an efficient rate, fostering faster growth may cause diseconomies such as housing shortages and traffic congestion.

E. Other Reviews of the Regional Development Theory Literature

149. Feser, Edward J. 1998. Enterprises, external economies, and economic development. *Journal of Planning Literature* 12, 3: 283-302.

In this thorough overview of the role of external scale economies in regional economic development, Feser compares external economies to the related, but often misunderstood concepts of economies of scope, agglomeration economies, and externalities. This publication also provides a useful summary of the work of other seminal regional development theorists, such as Edgar Hoover, Alfred Marshall, and Alfred Weber, including more recent developments in the industrial restructuring and flexible specialization literature.

150. Guild, Robert L. 2000. Infrastructure investment and interregional development: Theory, evidence, and implications for planning. *Public Works Management and Policy* 4, 4: 274-85.

This article provides a concise summary of many significant works in the regional development theory literature to determine the link between public infrastructure investments and regional economic development. Guild focuses on impacts related to sectoral development and social development. Regarding the former, infrastructure is seen as an input into the production process, affecting the productivity of other productive inputs, and lowering congestion costs. Infrastructure investments affect social development through income effects and impacts on access to needed facilities and services. Guild concludes by drawing on the work of Niles Hansen (1965) to explore the implications of infrastructure development for regional development.

151. Higgins, Benjamin, and Donald J. Savoie. 1995. *Regional development theories and their application*. New Brunswick, NJ: Transaction Publishing.

This is one of the few books to provide a comprehensive summary of the cross-disciplinary contributions to regional development theory, including perspectives from anthropology, sociology, regional planning, and traditional perspectives from the regional economics literature. The second section of the book focuses on case studies of

regional planning in the United States, Europe, Canada, Australia, and in the developing world.

152. Leigh-Preston, Nancey. 1985. Industrial transformation, economic development, and regional planning. *CPL bibliography no. 154*. Chicago: Council of Planning Librarians.

This bibliographic review of the regional development literature provides a summary of the early classics as well as a thorough summary of early works in the industrial restructuring literature that addressed regional development issues.

153. Nelson, Arthur C. 1993. Theories of regional development. In *Theories of local economic development*, Richard Bingham and Robert Mier, eds. Newbury Park, CA: Sage.

This summary gives a concise overview of the regional development theory literature from two global perspectives: the "development-from-above" school, which views regional development of hinterland regions in terms of the flow of resources from core areas, and the "development-from-below" school, which views regional development as something that emerges from the local institutions created within developing regions.

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IV. AUTHOR INDEX

Acs, Zoltan J., 129
 Alonso, William, 10 (1975), 135 (1968)
Annals of Regional Science, 105
 Arrow, Kenneth J., 106
 Aschauer, David Alan, 107
 Auerbach, Paul, 37
 Azis, Iwan J., 12
 Balassa, Bela, 3
 Barro, Robert J., 27 (and Sala-i-Martin, 1999), 108 (1990)
 Bartik, Timothy J., 136 (1990), 137 (1991)
 Bluestone, Barry, 62
 Bolton, Roger E., 138
 Borts, George H., 28 (1960), 29 (and Stein, 1964)
 Boudeville, Jacques Raoul, 39
 Bretschger, Lucas, 130

Button, Kenneth, 109
 Cass, David, 110
 Castells, Manuel, 80
 Christaller, Walter, 19
 Coase, Ronald H., 99
 Cooke, Philip, 72
 Cronon, William, 94
 Crowder, Kyle, 95
 Danson, Michael W., 63
 Darwent, D.F., 40
 Devletoglou, Nicos E., 16
 DiGiovanna, Sean, 74
 Dixit, Avanish K., 119
 Dixon, Robert J., 34
 Drennan, Matthew P., 12
 Dunn, Edgar S., 30 (and Perloff, Lampard, and Muth, 1960), 73 (1970)
 Eaton, B. Curtis, 17
 Edel, Matthew, 81
 Eggertsson, Thrainn, 100
 Fainstein, Susan S., 64
 Fan, Wei, 120
 Ferguson, Deron, 132
 Feser, Edward J., 149
 Fisher, Joseph L., 51
 Fox, Karl A., 1
 Friedmann, John, 41 (1966), 42 (1972), 43 (1978), 82 (1979), 139 (and Weaver, 1979)
 Fujita, Masahisa, 121 (and Krugman and Venables, 1999), 131 (and Mori, 1998)
 Giarratani, Frank, 2
 Glaeser, Edward L., 111 (and Kallal, Scheinkman, and Shleifer, 1992), 122 (1994)
 Goodman, Robert, 83
 Gordon, David M., 84 (1971), 85 (1977)
 Gross, Harold T., 61
 Guild, Robert L., 150
 Hansen, Niles M., 140
 Harrington, James W., 132
 Harrison, Bennett, 62 (and Bluestone, 1982), 65 (1985)
 Harvey, David, 86
 Heckscher, Eli F., 4
 Henderson, J. Vernon, 50 (1974), 123 (1996)
 Hermansen, Tormod, 44
 Higgins, Benjamin, 45 (1983), 151 (and Savoie, 1995)
 Hirschman, Albert O., 46
 Holland, Stuart, 87 (1976), 88 (1979)
 Hoover, Edgar M., 2 (and Giarratani, 1985), 14 (1937), 51 (and Fisher, 1949)
 Hotelling, Harold, 18
International Regional Science Review, 124
 Isard, Walter, 11 (1956), 12 (and Azis, Drennan, Miller, Saltzman, and Thorbecke, 1998)
 Isserman, Andrew, 141
 Jacobs, Jane, 112
 Johansson, Borje, 133
 Kaldor, Nicholas, 35
 Kallal, Hedi D., 111
 Karlsson, Charlie, 133

- Koopmans, Tjalling, 113
 Krugman, Paul, 121 (and Fujita and Venables, 1999), 125 (1999), 126 (1991)
 Kumar, T. Krishna, 1
 Lampard, Eric E., 30
 Lasuen, Jose Ramon, 47
 Lav, Michael R., 21
 Lee, Yong-Sook, 74
 Leigh(-Preston), Nancey Green, 66 (1994), 152 (1985)
 Lipsey, Richard G., 17
 Logan, John R., 95 (and Whaley, Crowder, 1999), 96 (and Molotch, 1987)
 Losch, August, 20
 Markusen, Ann R., 58 (1985), 74 (and Lee and DiGiovanna, 1999), 89 (1987)
 Marshall, Alfred., 15
 Martin, Ron, 114
 Massey Doreen, 67 (and Meegan, 1982), 90 (1984), 142 (1979)
 Meegan, Richard, 67
 Miller, Ronald E., 12
 Mills, Edwin S., 21
 Molotch, Harvey, 96 (and Logan, 1987), 97 (1976)
 Morgan, Kevin, 72
 Mori, Tomoya 131
 Moulaert, Frank, 68
 Muth, Richard F., 30
 Myrdal, Gunnar, 36
 Neary, J. Peter, 127
 Nelson, Arthur C., 153
 Nijkamp, Peter, 115
 North, Douglass C., 22 (1955), 23 (1956), 101 (1990), 102 (1991)
 Noyelle, Thierry J., 69 (and Stanback, 1983), 143 (1983)
 Oates, Wallace E., 144
 Ohlin, Bertil, 5
 Perloff, Harvey S., 30
 Perroux, Francois, 48
 Perry, David C., 93
 Piore, Michael J., 75
 Poot, Jacques, 115
 Porter, Michael E., 76
 Pred, Allan, 52 (1977), 128 (1966)
 Ramsey, Frank, 116
 Rees, John, 61
 Richardson, Harry W., 24 (1978), 117 (1973), 145 (1979)
 Romer, Paul M., 118
 Rostow, Walt W., 53 (1956), 54 (1977)
 Sabel, Charles F., 75
 Sala-i-Martin, Xavier, 27
 Saltzman, Sidney, 12
 Salvatore, Dominick, 9
 Samuelson, Paul A., 6 (1948), 7 (1949), 8 (1953)
 Sassen, Saskia, 70
 Savoie, Donald J., 151
 Saxenian, AnnaLee, 77
 Scheinkman, Jose A., 111
 Schumpeter, Joseph, 55 (1934), 56 (1947)
 Schwab, Robert M., 144
 Scott, Allen J., 78
 Skott, Peter, 37
 Setterfield, Mark, 38
 Shleifer, Andrei, 111
 Smith, Neil, 91
 Solow, Robert M., 31
 Stanback, Thomas M. Jr., 69
 Stein, Jerome, 29
 Stiglitz, Joseph E., 119 (and Dixit, 1977), 146 (1989)
 Stohr, Walter, 147
 Storper, Michael, 71 (and Walker, 1984), 79 (1997)
 Stough, Roger, 134
 Sunley, Peter, 114
 Swan, Trevor W., 32
 Swyngedouw, Erik, 68
 Taylor, Michael, 59
The Review of Radical Political Economics, 92
 Thirlwall, Anthony P., 34
 Thomas, Morgan, 49
 Thompson, Wilbur R., 57 (1968), 148 (1975)
 Thorbecke, Erik, 12
 Tiebout, Charles M., 25 (1956a), 26 (1956b)
 Todtling, Franz, 147
 Treyz, Frederick, 120
 Treyz, George, 120
 Varga, Attila, 129
 Venables, Anthony J., 121
 Vernon, Raymond, 60
 Walker, Richard, 71
 Watkins, Alfred J., 93
 Weaver, Clyde, 139
 Weber, Alfred, 13
 Weinstein, Bernard L., 61
 Whaley, Rachel Bridges, 95
 Williamson, Jeffrey G., 33
 Williamson, Oliver E., 103 (1975), 104 (1985)
 Wilson, Patricia, 68
 Wolman, Harold, 98