

# Agglomeration Economies and Spatial Distribution of Economic Activity: A Theoretical Perspective



*Nashville, Tennessee (2008). Source: Kris Hartley*

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May 6, 2009

## Introduction

In the time since scholars first brought spatial elements into the study of economic growth, the field of urban geography has benefited from a diverse body of interdisciplinary research. Each of the theories advanced at varying stages along the field's research progress curve makes scholarly advancements for the explanation of spatial distribution in urban and metropolitan growth, and informs current work concerning the emergence of agglomeration economies. Roughly following a chronological line in the development of theories about agglomeration economies, this paper will explore some of the most important individual contributions to the corpus of scholarship, summarizing each author's main points and relating these to modern notions of economic development. Early research about the origin of cities and agglomeration economies will establish a theoretical foundation for this comparative study, including revisionist explorations of location theory that cast American regional economic growth in an historic context. Next, the paper will explore alternative agglomeration models that contradict traditional development theory. With these issues having been explored, a theoretical groundwork will be constructed for an exploration of the modern American industrial landscape. Finally, the structural economic shift of America's post-war economy will be investigated, including the decline of Rust Belt manufacturing and emergence of Sun Belt agglomeration economies. These phenomena will be examined on the firm-level, city level and regional level, through recent studies about the affects of factor price arbitrage, demand shifts and technological progress.

### From Agricultural Isolation to Urban Agglomerations (Jane Jacobs, *The Economy of Cities*)

In order to conceive a more informed notion about agglomeration economies, it is necessary to explore scholarly thought about the origin of the urban form and city growth. As an important thought leader in urbanism, Jane Jacobs has contributed to planning research by playing the role of a critical iconoclast liberated from the dialectic confines of the scholarly community. From this perch Jacobs holds to account urban policies that have perpetuated the same problems they propose to solve, prompting her to revisit long-held assumptions about imbalanced growth among cities. Her fundamental theory rests on the notion that agricultural development spawns from innovations produced by urban agglomeration economies, contradicting the theory of

“agricultural primacy” (a tenet long held by economists, historians and anthropologists). Modern economic development has been informed by these false tenets, claims Jacobs, and this explains its frequent failure to stimulate growth.

Jacobs highlights correlations between urbanization and agricultural productivity in Japan, whose population boom in the mid-1900's was supported by nationally grown food (except for imported meat). If the relationship between urban development and agriculture were sequential rather than correlative, she argues, many currently developed countries would still be waiting for urban growth. Innovations that occur in cities, such as electricity, are exported to rural areas where they improve agricultural efficiency. Jacobs also cites Ireland, in which demand outstripped agricultural supply during the potato famine in part because the country lacked urban areas and “best practices” produced therein. Jacobs insists that economists are often lured into the trap of believing that rural economic output grows endogenously, when in many cases it was fueled by the relocation of methods and expertise from cities in an effort to exploit labor cost differences. The same holds true for rural European “cottage industries,” which originally developed in cities. In medieval agricultural development, Jacobs points out that the “field system” developed first around cities, and last in remote places. The same occurred for animal husbandry in ancient Egypt. “Farm work” in America, such as practices in beef slaughter and packing, originated in Kansas City and Chicago but were eventually exported to rural areas.

To illustrate her point, Jacobs use a hypothetical city, New Obsidian (modeled after the ancient Near East settlement of Catal Huyuk) as the pre-agricultural example of a “depot” or “production” settlement, in which commodities trading brought far-flung people together in spatial agglomeration. With a wide variety of bartered agricultural goods, the city's exchange of ideas drove local production that was previously imported, and this enriched the economy while expanding population. Likewise, itinerant traders, having been exposed to New Obsidian's variety of goods and production methods, took those ideas back to their communities. The dissemination of this information improved agricultural practices, and sometimes “subtracted work” by improving existing methods or relocating activities closer to cities. This in turn drew population away from affected rural settlements.

Jacobs further argues for the importance of agglomeration economies and against the aggro-centrist theory by invoking researched evidence of pre-agricultural settlements where food shortages were not a problem, referencing Adam Smith's observations that also contradict the theory (including the fact that England's commerce and industry outgrew its agriculture). Jacobs proposes theories of economic growth that support her claims about the value of agglomeration economies; her arguments reject arithmetic growth based on increased production of existing goods and instead embrace the theory of "new work" and innovation that incubate in agglomeration environments. The component processes of an overall manufacturing system give rise to new methods and products, which in turn find their own undiscovered markets. As such, innovation more resembles the branches of a tree, rather than a logically linear progression of better practices within the same work type. Jacobs cites 3M as an example, in which the original core product (tape) gave rise to a variety of peripheral goods that served new markets.

In the case of "new work," ideas most often come from problems in the existing work, or innovations generated from it, rather than customers making suggestions, since they are the end-users and are unfamiliar with production processes. Jacobs describes the details of how industries develop from copied work, using Ford as an example. Originally assembling cars from goods made by others producers in Detroit's local economy, Ford gradually brought those processes in-house, and Jacobs credits the company with the innovation of promising a full stock of repair products to customers. Jacobs does not advocate the abandonment of old work, however, citing its conservation as a key element for growing, successful economies. However, stagnant regions are apt to abandon old work when newer trends arise, and this throws society into "well-known havoc." Larger organizations are unable to support "new work," and must avoid the inevitable stagnation by purchasing smaller companies that have the flexibility, organizational structure, and risk profile to innovate. As large organizations seek more strategic control over expansion, the happenstance nature of "discovery" cannot always be relied upon to produce new work when it may be needed, according to Jacobs. Division of labor is not a line that separates stagnant and growing economies, moreover it is the development of individual units of divided labor into new work that generates growth. Agglomeration economies are well suited to take advantage of the innovations that come about from this model, as multiple small firms have the flexibility to quickly adopt such practices and exploit new markets.

It is evident that Jacobs presents theories that part with generally accepted scholarly thought about economic development and agglomeration. In its revisitation of traditional assumptions and conclusions, however, her work is valuable in understanding the complex and often disputed landscape of urban economics and its contributions to practice.

When Traditional Theory Fails to Explain Stagnation: Agglomerations and Development in Overlooked Regions (Jane Jacobs, *Cities and the Wealth of Nations*)

In *Cities and the Wealth of Nations*, Jane Jacobs notes that economists' attempts to solve economic challenges rely on faulty assumptions so casually taken for granted that they slip below the radar of robust scrutiny. The example cited by Jacobs is the notion that national economies are the most useful unit of analysis for understanding how economic life works, a favorite assumption of even Adam Smith. Communists and socialists also promote faulty tautologies, Jacobs claims, incorrectly applying Marxist principles in a nation-centered context. Although nations are clearly definable entities, they say little about the function of economics, particularly in comparative studies, because differences among them lead to false conclusions (e.g. the comparison a city-state like Singapore to America). Jacobs cites Bardou, a French mountain village, as an example of a city that passively responds to changes created in distant cities; this case calls for the examination of city evolution as an exogenous phenomenon. Jacobs argues that successful cities, as they capture the benefits of agglomeration economies, gradually replace imported goods with internally-produced goods through innovation, a process that out-earns its cost of capital when those goods in turn become the city's own exports. In this way, "import-replacement" is a purely regional/city-specific phenomenon, as opposed to a national one, and has the opportunity to create a regional competitive advantage.

Jacobs also addresses the notion of city boundaries, acknowledging their lack of significance as residential and commercial activities extend ever outwards. She makes an important distinction between cities that produce "regions" (Boston, San Francisco, New York) and those that do not (Atlanta, Seattle, Dublin). What constitutes a city region is the ability to replace imports "exuberantly and repeatedly," among five "forces of expansion:" markets, city jobs, technology,

transplants and capital. Her model has nothing to do with size, but with cities' population concentrations in proportion to other cities within their countries. For instance, Copenhagen is considered a "city region" despite its relatively small population of 500,000. Jacobs also describes the Japanese hamlet of Shinohara, once a sleepy farming village but eventually overtaken by the expansion of Tokyo's urban region. Shinohara experienced rapid but proportional change in each of the five factors above, transforming into a vibrant, economically diverse agglomeration economy based on transplanted industries and the external economies generated from them. This example illustrates Jacobs' point about the reliance of surrounding regions on development generated by a major central commercial center.

"Supply regions" are places whose economies (both healthy and poor) are dependent upon a patron city region or other distant outside market. With Uruguay as an example, Jacobs insists that wealthy supply regions simply import goods without the desire to produce them; this neglects the traditional path of economic development, in which the highest state of evolution is import substitution. Because of the wealth generated by an export activity, there may be less urgency to develop endogenously productive economies. Uruguay became trapped in this cycle when other countries supplied the same exports at lesser cost. Uruguay suffered diminished import ability and was quickly forced into producing goods for itself without the capacity to diversify manufacturing. The resulting mobilization was labeled by Jacobs "crash industrialization" and its result a "fiasco." Poor central planning located import-replacement activities in economically disadvantaged rural regions, failing to acknowledge that such activity is best performed in urban regions with agglomeration economies. It is unwise, she insists, to ignore the development of import-replacement production when, as a supply economy, a country bases its economic health on exogenous demand whims. Many smaller countries fall into this trap (or were placed there by colonialism) because of their historic export role centered on a single commodity (e.g. Zambia and copper). Depletion of these resources, complicated by variable global demand, often leads to economic decline and a hasty, unplanned response.

Jacobs also maintains that declining city regions face stagnation that results from the loss of people and jobs, a thinning out of the economic profile, and the resulting general idleness, typical phenomena in rust-belt North America and parts of Latin America. Job opportunities are the

common cause, and financial remittances from emigrants do little to stimulate growth. One example is Napizaro, Mexico, which saw a rise in the quality of life from remittances, but no endogenous development of a sustainable agglomeration economy. Despite the best intentions of returning emigrants, setting up business and other industrial infrastructure is often obstructed by a variety of governmental, social and economic constraints, according to Jacobs.

Improved productivity is often a solution to economic stagnation for regions at the early stages of development. Drawing on her theory from *The Economy of Cities* that people migrating to other occupations improve agricultural efficiency, Jacobs cites Scotland, where clearance of subsistence farmers opened up more grazing room for sheep but resulted in unforeseen social consequences. “Agricultural clearing” was also undertaken in the American South, when government subsidies and equipment loan programs increased productivity and allowed more land to be cultivated by fewer people. However, some cities did not agglomerate as planned and failed to provide jobs for displaced farmers. The attendant social costs canceled out economic gains from increased agricultural productivity. Russia has the capacity to produce for its own population, but agricultural yields are so scant that it must import, and the reasons are inept planning and uncaring workers, according to Jacobs.

Jacobs also analyzes transplant regions, which typically experience in-flow of economic activity relocating from other places. Regions that benefit often have weak or non-existent agglomerations and attract the type of economic activity that would not benefit from agglomeration (e. g. assembly as opposed to research and development). Atlanta is an example, with aircraft, textiles and military installations. Originally located in Los Angeles, Lockheed needed the services agglomerated in that region, but Lockheed’s mature-stage self-sufficiency allowed it to follow cheap labor, leading it to Atlanta. Transplants, however, are often a tenuous basis on which to establish industrial growth, states Jacobs, because companies are likely to move again when factors of production (labor) become cheaper elsewhere. Taiwan is a successful exception, in which proprietary industry knowledge from transplant industries drove the endogenous growth of new industries using local capital, as entrepreneurs eventually competed against the transplant companies that first hired them. This naturally led to Jacobsean “import replacement,” and Taipei and Kaohsiung boomed into successful agglomeration

economies of the traditional mold. These cities became desirable destinations for Taiwanese seeking jobs, housing and opportunity, resulting in a growth feedback loop.

Rural, undercapitalized regions must rely on loans and subsidies from governments and international aid organizations because they lack capacity to grow, in comparison to agglomeration regions. Constrained also by debt defaults and currency fluctuations, countries that need growth are driven further into a spiral of economic desperation (Volta Dam in Ghana is cited as an example of failed projects to spur growth). When capital flows into these regions, according to Jacobs, the absence of cities and agglomeration economies prevents the generation of import-replacement activity. Another example is the Tennessee Valley Authority, which infused a poor region with capital and job opportunities but did little to boost growth. Such overlooked regions are often rooted in fierce self-sufficiency that prevents trade and interaction. As crafts die with heritage, there is no infrastructure or diversified economy to sustain growth, and these regions are often dependent on a fortuitous exogenous event to “shock” them into the modern economy. Examples include disinvested regions of Appalachia.

Jacobs’ examination of the causes and patterns of economic growth lends a valuable perspective to the study of agglomeration economies, especially through cases of failed initiatives. Although theory holds that agglomerations evolve naturally out of market dynamics, demand and resource holdings, Jacobs makes a clear case that complicating factors such as culture, governmental patterns, and productivity can explain some exceptions to traditional growth theories.

American Economic Growth: Traditional Models Do Not Apply (Douglas North, *Location Theory and Regional Economic Growth*; Charles Tiebout, *Exports and Regional Economic Growth*)

While it may be tempting to develop and apply a standard development theory for the explanation of agglomeration economies, factors such as history and imbalanced resource endowments create challenges to universally applied models of economic growth, as has been exhibited by Jane Jacobs. Illustrating this research obstacle is a scholarly exchange between Douglas North and Charles Tiebout.

North assails traditional development theories as incapable of explaining economic development in America. The crux of the difference lies in the fact that, unlike continental Europe, America did not grow out of subsistence economies. Instead, American cities and regions were designed at the start as colonialist extractive economies, centers of collection, distribution and occasional conversion for natural resources in the area. The Pacific Northwest is an example, with a thriving lumber industry and exports as far as Europe. In this way, America's regions have evolved in the profit-maximizing capitalist model, with agglomerations developing around resource endowments. In Europe, a sequence of five stages (subsistence, some trade, interregional trade, industrialization, and tertiary export industries) has accounted for economic growth, a model that development economics literature has incorrectly applied, according to North, to dissimilar regions such as America. Location theory better explains the development of regional American economies. As settlements developed around raw materials, agglomeration economies followed, improving cost advantages captured by competitive producers. However, agglomeration economies too deeply entrenched in their traditional industrial arrangement develop a "conservative bias" in which they tend to cling to their export staple rather than planning for changes in factor markets, product demand and technology.

North also distinguishes between two different local economies: the traditional export economy, and the residentiary economy, the latter of which exists to provide goods and services to the local population. A measure of the relationship between the two is the "location quotient," which compares the concentration of intra-regional employment across sectors. As regions mature, nodal centers of agglomeration develop (concentrations of commercial activity where there is a locational advantage), followed by subsidiary industries that serve the primary export industry. North assails the notion that a region must industrialize in order to grow, questioning the statistical rigor of industrialization's academic defenders and their basic "misunderstanding of the nature of the economy" (namely, that agriculture cannot also be profitable). North describes four types of secondary activity (materials-oriented, service industries to the primary industry, residentiary, and footloose), all of which will naturally develop out of the original industry and depend on its success. Accumulated capital, an advantage enjoyed by regions experiencing higher income and population growth, tends to "overflow" into other activities, expanding and diversifying the secondary economic base and ultimately developing other export industries.

Charles Tiebout challenges several of North's assertions. First, he maintains that the economic health of a region is tied to its export base only in the case of smaller regions. Tiebout discounts the importance of exports, saying that they are not a large part of national income in the US; he introduces business investment, government expenditures and residential construction as equally influential on regional income and the development of agglomeration economies. He also disputes North's claim of export base as income determinant, saying that it is only a short-run concept. The volume of exports depends on the income of the surrounding area, Tiebout says, as factor costs explain growth in a more correct application of the location theory model. Moreover, Tiebout insists that factor costs are dependent on a region's residentiary, not primary, activities. In short, Tiebout argues that regions should balance their inputs between export and residentiary activities, whose optimum combination maximizes income.

North replies to Tiebout's short-run criticism by saying that that export bases have been influential in shaping the history of American regions. Residentiary industries develop out of increased income, except when influenced by government expenditures, non-economic migration, and changes in the relationship between residentiary and export industries. North assails Tiebout's distinction between regional growth and economic development, insisting that the two have been inextricably linked in American history. In response again, Tiebout maintains that exports are an incomplete explanation for long-run growth, and insists that the stage theory is not necessarily wrong, but that it does not explain the development of America in particular.

This dialogue exposes some of the commonly held assumptions behind growth theories, and is useful in uncovering the ways in which the complexity of industrial activity and economic interdependencies can create a "wicked problem" for scholars attempting to explain agglomeration economies using a single theory. The discussion between North and Tiebout also serves as a cautionary tale for researchers attempting to explain regional development in one international context using modular theories developed from another.

Exceptions to the Model: “Third Italy” (Sebastian Brusco, *The Emilian Model: Productive Decentralization and Social Integration*)

Emilia-Romagna (E-R), an agglomeration economy in north-central Italy south of the Venezia-Milano-Firenze triangle, has shown economic improvement and resilience that has disrupted traditional development theories. In comparison to the rest of Italy, the region’s unemployment is lower and per-capita income higher, while exports had experienced (at publication time) an uninterrupted 17-year rise. According to Brusco, there is nothing significantly different about E-R’s labor force distribution by sector and industry when compared to Italy. The one salient factor, however, is the preponderance of small firms that have agglomerated in the region, including an informal secondary labor market of solo artisans and homebound craftspeople who elude government notice. Furthermore, small firms geographically collocate by product, creating a flattened network of horizontally integrated units in a spatial distribution reminiscent of Massey-esque<sup>1</sup> international models (except they are clustered by sector and not work type.)

As an agglomeration economy following the network model of productive outsourcing (referenced in Stephen Goldsmith’s *Governing by Network*<sup>2</sup>), E-R’s small firms source production among themselves, creating productive flexibility that enables them to respond quickly to changes in demand. This is not purely a consumer good phenomenon, however, as the dynamic is also evident for engineering and machine manufacturing. E-R is also home to a considerable “black labor” market, in which workers are paid “under-the-table,” and for whom employers make no governmental social welfare contributions. It is the flexibility of hiring from this agglomerative market that also facilitates time-responsive, demand-sensitive production.

The rise of the small firm gathered momentum across Italy in the late 1960’s due to stronger union influence, which, according to Brusco, fought for improved conditions, internal redundancies, work process restructuring and collective bargaining. As all of these factors exerted upward pressure on production costs, large firms began to “vertically disintegrate.” Additionally, it was more difficult for large firms to legally adjust workforce size to meet variable demand, whereas unfair dismissal legislation did not apply to firms under 15 employees. Another major factor contributing to the advent of the small firm was a change in consumer

tastes for specialized products; this demand-side phenomenon favored companies with flexible production, an advantage gained through agglomeration economies. Given the assumption that most firms would rather compete on product attributes than price, and in the effort to avoid a damaging race to the cost curve trough, mass production of commodity goods and the attendant economies of scale were no longer a source of sustainable competitive advantage. “Flex tech” and short production runs became the new profit models, arrangements that took advantage of local agglomerations of labor capital and knowledge. What followed was a corresponding decrease in demand for production machines, a market dynamic for which only smaller firms had the ability to quickly adapt and retool. To producers of multi-component goods, insists Brusco, the make-or-buy decision became clear: decentralize and outsource, or cede competitive position under pressure from firms with disruptive flexibility.

In an environment of fluctuating consumer preferences and corresponding movements in labor demand by segment, workers had the opportunity to enter the labor pool at their own discretion, according to their availability and wage expectations, while inter-segmental labor movement depended instead on factors such as skill and work intensity. As firms decentralized and workers moved from the primary to secondary sectors, production ramp-downs and the resulting redundancies displaced a greater percentage of secondary labor market workers, making that market a flexible labor supply buffer while primary firms maintained employment continuity (and cost) regardless of fluctuating market conditions. E-R’s agglomerative industrial structure remained healthy against international competition because of the flexibility of manpower, the high technical level of machinery, the development of entrepreneurial skill, and the collaboration resulting from worker-technician proximity (the latter a concept Jacobsian in its emergent “new work” theme). E-R’s advantage also came in its “interstitial” nature of production, in which some goods were mass produced in long-run production (commonly by developing countries), while others were less technologically-focused but up-market goods, produced more for specialty demand by firms in E-R. Productive agriculture, government efficiency and controlled urban development are also factors that explain E-R’s economic success, according to Brusco. The complexity of conditions in the E-R region makes modularity complicated, frustrating economic planners seeking to recreate them but beneficial for the preservation of E-R’s sustainable economic advantage and uniquely beneficial agglomerative structure.

Organizational Reductionism and Agglomeration Economies (Charles Sabel, *Flexible Specialization and the Re-emergence of Regional Economies*)

Until the early 1900's, national economies were perceived to be the aggregate of multiple regions, each with its own product specialization and agglomeration economies. By mid century, multinational corporations dominated the manufacturing landscape, with scattered centers of specialized production in re-emergent industrial centers and reconsolidated regions. In response to volatile demand, companies moved away from large capital investments and towards flexible production, decentralizing into networks of smaller producers, each taking advantage of its own local agglomeration economy. Governments also redirected their focus from social welfare to job creation, and improvement in labor-management relations fertilized the landscape for the advent of a new regime of small firm agglomerations. Such strategies proved more successful in building agglomerations, according to Sabel, than a focus on mass production, decentralized low-skill activities and macroeconomic control mechanisms.

Sabel states that the proven approach for the individual firm has been flexible specialization, moving up-market and commanding a price premium (similar to Michael Porter's theory of sustainable competitive advantage<sup>3</sup>). Examples are Brusco's Third Italy mentioned above, Denmark's Jutland, and Sweden's Småland, where small firms agglomerated into cooperative consortia in order to capture the cost benefits of collective negotiations for raw materials and credit. The theory that firms decentralized in order to by-pass the challenges of organized labor has been discredited, according to Sabel, and replaced by the a "social pact" theory in which companies encourage innovation and capture "learning advantages" in "productive communities" of industrial organization. As large multinationals decentralized production, so too did their institutional research facilities; therefore, innovation was pushed down the organizational hierarchy to the subsidiary level, where individual units were parts of their own agglomerative networks, generating new product ideas and work processes in models reminiscent of Jacobs' "new work" development model. Furthermore, some companies have decentralized but adapted their capacity to anticipate and respond to demand, focusing on mass production and economies of scale without retooling for new product development.

History is replete with failed regional economic development initiatives: mass production, welfare state initiatives, municipal Keynesianism (stimulation through investment in public works, which often leak out of the region), and industrial parks focused on a single industry (e.g. “High Tech,” which is risky in its volatility). According to Sabel, more successful has been private coordination of government programs to restructure existing industries, educate the workforce and finance locally owned firms through entrepreneurial credit offerings. Establishing the determinants of flexible production in a regional context is complicated. However, Sabel focuses on the notion of trust forged through common experiences, ethnic solidarity, and local pride. These social affinities facilitated compromise and unity through a shared sense of competition with outside entities, the Marxian notion of work as, according to Sabel, “collective in character and constitutive of individual identity,” and social pressure to enforce contracts.

Companies ultimately must balance the market risk of specialization with its benefits (demand cycle stability through product line diversification). Sabel argues for cross-regional, “macro-regulatory stabilization” to ensure sustainable regional prosperity and the success of agglomeration economies. He also argues that national unions and employers’ associations must work towards stronger regional-national relations and a centralized pooling of knowledge, but against increasing regional autonomy. Sabel ultimately cautions against the development of provincial industrial districts through the spread of flexible economies, which divides nations into variably prosperous agglomerative economies and exacerbates interregional inequality in the absence of redistributive mechanisms.

Beyond Agglomeration: Social Networks for Mutual Benefit (Bennett Harrison, *Industrial Districts: Old Wine in New Bottles?*)

The theory of industrial districts maintains that a new epoch of economic growth has emerged; clusters of small, closely linked craft-like firms within the same industry taking advantage of flexible production. Harrison asks whether this theory is simply the agglomeration economy theory recast, especially in light of more recent scholarship that focuses on the decentralization of production. Harrison proposes that the difference between traditional agglomeration and recent industrial district theory is that the latter emphasizes firm cooperation and

interdependence. Technology has allowed small firms to retool according to the demand whims of the market, rendering economies of scale not a firm-level, but an industry-level benefit.

Early theories held that firms take advantage of public external economies (infrastructure), but eventually “pecuniary external economies” allow some firms to benefit from investment and expansion by others; both situations yield agglomeration economies in which per-unit production costs lessen. Perroux’s *pôles de croissance* theory<sup>4</sup> is industry-centered, but out of it emerges the notion that economies with Schumpeterian innovation multiply their growth through the attraction of other industries in an innovation-led feedback loop. Areas hosting production that has reached a mature phase, or whose processes can be standardized and relocated, must re-tool for “new work” (Jacobs) to stay competitive. A counter-theory would discredit the impact of agglomeration economies on product cycle theory, stating that large corporations look inward for innovation and institutionalize research and development. According to Harrison, the MIT school of thought maintains that such companies are locked in outdated models of production, mass-producing but failing to capture new markets because of institutional and productive stagnation.

In industrial districts, small firms form cooperative organizations and trade associations, and labor unions train workers for skill flexibility; this benefits companies, employees, and the region’s macroeconomic resilience. While the aggregate resources of these small firms offer their own external economy to larger outside firms (as they benefit from specialized expertise and productive responsiveness), Granovetterian inter-firm embeddedness (borrowing from sociology and behavioral economics<sup>5</sup>) informs a new theory that rejects the notion of firm as emotively vacant automaton. Partnership, loyalty and trust facilitate business interaction in agglomeration environments with multiple, interdependent, spatially proximate firms, as multiple social interactions reinforce business relationships. Paradoxically, firms concomitantly compete and cooperate (pooling materials purchasing power). In short, the notion of Harrison’s industrial district goes beyond the explanatory capabilities of agglomeration and external economies to include social cognitive theory and cultural dynamics.

Explanations for Agglomeration Growth amidst Regional Competition for Inputs (Harry Richardson, *Factor and Trade Movements*)

To paint a clearer picture of agglomeration economies and explanations for their development, it is necessary to examine the factors behind interregional trade, and explanations for the establishment of regional comparative advantage. Richardson insists that interregional trade exists where the same good has a cost difference between two regions that exceeds transport costs, providing arbitrage opportunities. However, commoditized goods, which are similar enough in price to be within the transport cost difference, are typically sold locally. Richardson explains interregional trade using the comparative advantage theory from international trade. As each region, assumed to be an agglomeration of complementary producers, specializes in a commodity that uses more of its “relatively abundant factor,” economic gains will accrue to all parties. These initial resource endowments give rise to specialization, but capital and labor endowments are more instrumental for industrial growth in the longer term.

Richardson then imports space into his economic analysis. This preceding model assumes factor immobility, but in reality all factors of production fall along a mobility continuum (labor might be less mobile due to psychic barriers, capital due to uncertainty, and other factors due to high transport costs). All of these factors are more mobile within regions than across oceans, but demand functions are also more uniform within regions. Richardson examines migration and the extent to which labor is compelled to move due to non-economic reasons such as amenities, service benefits, and “distance frictions” (physical, psychic, and social uncertainty). More importantly, Richardson exposes the faulty mechanism of wage equilibrium, pointing out that the movement of labor from low to high-wage areas has done little to adjust “persistent inter-area” wage regimes. Richardson maintains that migration research based on aggregate data fails to recognize that the act is purely a personal one, and no model can account for the irrationality of self-sufficing behavior that operates outside the bounds of economic logic (as opposed to Sjaastad’s *Net Present Value* theory of migration<sup>6</sup>).

With regard to capital mobility among agglomeration economies, Richardson recognizes the different theories of its importance. Viewed as a commoditized good in an efficient, competitive

marketplace without regional boundaries, capital flows freely to its highest-return opportunity. Alternative views assume that capital is invested in physical goods and in its illiquid state is immobile, while other arguments against perfect capital mobility, according to Richardson, hold that businesses invest in expansion as a result of internal policies and goals without regard to regional diversity, and that the political nature of government investment tends to ignore return rates. Location theory itself has little impact on profit-maximizing motives in the decision to mobilize capital, Richardson insists. Additionally, many projects are so capital intensive that they may not be undertaken altogether without an enormous capital outlay, as opposed to the marginal benefits of incrementally invested capital (as one might experience in buying an additional share of stock, or approving an additional applicant for a Section 8 voucher). The external economy theory would further discredit the perfect mobility model, insisting that capital outflows gravitate towards the best financial return without regard to social rates of return (as opposed to the “double bottom line”<sup>7</sup>). Capital is prone to staying local, due to imperfect information (a key component to the efficient markets theory) and lower risks; this serves to perpetuate the interregional polarization effect.

Richardson also explores entrepreneurial mobility, acknowledging that the motives of entrepreneurs are varied and impossible to herd into one “determinate theory.” Without any guarantee of equilibrium, the market for entrepreneurs can still be argued to hinge on educational opportunities, prevailing social mores, leisure opportunities, and other trends that are historically entrenched; these are often the results of agglomerated service providers and amenity infrastructure<sup>8</sup>. Entrepreneurs do not naturally flow to the areas that need them, due to the variety of personal factors also associated with typical labor migration. Likewise, the diffusion of innovation does not occur with geographic regularity, but tends to agglomerate in certain regions. Typically disseminated through channels of communication, as human thought is a fairly “mobile” good, innovation has a tendency to skip regions and is commonly shared at equivalent educational levels of society, among people in the same industry or in similar elite circles. In this way, there is a “virtual agglomeration economy” in which ideas locate by network, through telecommunication rather than physical location, according to Richardson. An innovation might never travel beyond the walls of a research lab, but instantaneously travel halfway around the world, because in an information age mobility exists among networks and

has little transfer cost. However, a slight tendency has been shown for innovation to “trickle down” to the immediate area of its source, even among areas of unequal access to specialized information. The study of factor mobility helps to explain how certain agglomeration economies develop an advantage over others within a regional context, and establishes a groundwork for exploring imbalanced economic growth in the context of advanced telecommunication.

Regional Imbalance in Agglomeration Growth (Albert Hirschman, *Interregional and International Transmission of Economic Growth*)

In a Jacobsian sense, Agglomerations naturally grow out of the necessity for a central trading depot, but history has shown that not all agglomeration economies have grown to their theoretical potential, while others outgrow this potential and defy traditional development explanations. Hirschman emphasizes “poles,” in which the uneven development of agglomerations within a unit of measurement (nation, continent, earth) springs from overall economic growth of that unit. Imbalanced interregional growth can compromise a country’s international comparative advantage, according to Hirschman. Grafting social psychology onto location theory, Hirschman insists that investors focus interregionally on established poles of development, where they believe agglomeration economies produce a better return. This isolates under-developed regions by branding them inferior (which often turns out to be a self-fulfilling prophecy), generating a feedback loop in which growth of the successful regions outpaces that of the unsuccessful. In turn, the “victims,” stranded as the collateral damage of economic progress, make equally irrational claims that successful investors are crass and culturally insensitive. Denied the benefits of investment, these regions become isolated and perpetuate their own self-destructive, provincial tendencies. Below the surface of Hirschman’s argument is the implication that the American south is the disinvested region being described.

In an interregional context, there is an undeniably symbiotic relationship in which the “trickling down” of progress enriches the economies of the “south.” This takes place because the disadvantaged region still provides factor inputs to the finished products that make the “north” wealthy. On the other hand, this relationship further entrenches the south in economic blight, and results in the south buying goods from the north it might otherwise have bought from abroad (but

which tariffs have made more expensive). Eventually, the south will also lose talented labor to the north, according to Hirschman. As the north gathers momentum, its production machine outgrows itself through industrial congestion, and an impoverished south will fail to provide the necessary market to buy enough of the north's goods to justify the increased output.

Hirschman also addresses the regional distribution of public investment, in which money flows to underdeveloped regions for political purposes, but neglects the better economic returns offered by investment solely in an agglomerated, developed region. On the other hand, governments are often reluctant to undertake the massive development projects required to equalize regions, because the prospect of an unfinished project is more politically risky than one never announced, according to Hirschman. When governments decide to invest in underperforming regions at the early stages of their development, these are often the most valuable expenditures because they establish the fundamental infrastructure on which future economic development and agglomeration growth is based; additional public investments will be financed, supposedly, by the success of industries that benefit from the initial governmental capital outlay.

Hirschman's argument in favor of "southern separation" is based on the notion that the polarizing effects would be less harmful, especially with regard to factor mobility. Also, the competition between the north and south moves from an absolute to a comparative advantage, in which the south would be able to compete internationally in exports that it produces "least poorly." Other advantages for the south would include unobstructed industrialization, economic sovereignty, and higher barriers to factors movement (skilled labor). The case against southern separation includes the loss of an economic trickle-down effect, especially if the south has nothing essential to provide. Also, the south would lose the benefits of ("selfish") northern investment, made so that the north has a supplier of factors and a market for finished goods. Hirschman ultimately proposes a hybrid model, in which countries grant their underdeveloped regions a degree of sovereignty, provide aid to the development of industrial infrastructure and agglomerations, preserve the complimentary relationships that benefit lagging regions, and diminish the negative effects of regional economic polarization.

Relocation of Manufacturing to the Sun Belt: Lessons for Regional Economics (Alfred Watkins and David Perry, *Regional Change and the Impact of Uneven Urban Development*)

The shift of economic activity from the American Northeast to the Sun Belt calls for a reappraisal of entrenched economic development theories, and the authors investigate the notion of economic convergence as it is realized in a new regime of spatial disequilibrium. This is a powerful concept in the attempt to understand how agglomeration economies have developed in the industrial and post-industrial eras. Convergence apologists suggest that Sun Belt cities, such as Houston, grow because of the cost advantages accrued from cheap factor inputs (land, labor, taxes), but that an eventual state of equilibrium will smooth out growth rates across all regions. In this way, an Adam Smithian Invisible Hand guides the economic atmosphere, which in times of readjustment often reflects interregional disparity. This “convergence” then refers to a cross-regional normalization of income, growth rates and factor costs (along with “sociocultural peculiarities”).

However, the authors question these theories on the grounds that they are unclear about which elements of the economic system are actually converging. Cities like Houston and Tampa have not developed by emulating Newark and Baltimore. As such, convergence is counterintuitive to the idea behind a “new Sun Belt economy” that is rebuilt using the lessons learned from failed Northeastern cities. This theory also assumes long-run equilibrium for all cities; however, other theories build on the notion of feedback cycles in which the growth of economy and population concurrently support each other through “cumulative causation,” leading either to sustained growth or decline and resulting in regional divergence, not convergence. Convergence is an illusion, claim Watkins and Perry: cities moving in opposite directions might seem to be coming together, but after they “pass” (as trains would) they proceed to move further apart. Uneven interregional development (Hirschman) better describes the economic landscape, with the salient concept being that regions with historical advantages will continue to grow, outpacing depressed regions. Regions with natural productive advantages in specific industries will experience the growth of their own uniquely oriented agglomeration economies.

Although it may be possible to argue that the rise of the Sun Belt discredits the convergence theory, the authors insist that southern expansion did not result in spite of the theory, but that the theory simply applied as it should although the circumstances and roles between north and south have shifted. The authors refuse to attribute southern growth exclusively to factor cost advantages; rather, they include capital accumulation and developmental barriers which had previously protected successful cities from competition but now entrap them in a cycle of economically failed activities. Rust Belt cities have agglomeration economies tooled for outdated production systems or for goods that are now manufactured elsewhere.

The authors have introduced a historical context for regional development. In the “mercantilist” period, each city established the largest possible hinterland market space. To counteract the growing influence of western and southern cities on their market regions, major East Coast business interests pushed for improved transportation infrastructure (Erie Canal, railways, et al.), which reduced transport cost, diminished the importance of locality in resource supply and created spatial barriers to development. These circumstances neutralized the benefits of agglomeration economies in victimized cities, despite their locational advantages. Traditional mercantile cities, which had already lost many of their markets to northern cities, fell further behind during industrialization, as they failed to diversify their economies while new cities ramped up capacity through improved manufacturing infrastructure that supported emerging industries such as steel, vehicles and machine goods. The south’s deep entrenchment in the agricultural system hampered its development, as did remote Northern ownership of industry (steel in Birmingham), and an unfavorable freight and product pricing schemes that made goods produced in northern cities cost-competitive in hinterland markets.

In the Sun Belt epoch, southern cities shed the development shackles of previous eras (“outmoded capital accumulation”) and stimulated economic growth by capitalizing on manufacturing in high-wage, rather than low-wage sectors. Southern growth was not a result of branch plants and industrial spin-offs, which only provide short-term, unstable economic growth for host economies (Jacobs’ Atlanta example). Instead, producers in new dynamic industries chose to by-pass traditional northern cities, according to the authors. The Sub Belt also benefited

from depression era Keynesian federal initiatives to improve infrastructure and boost aggregate demand, luring industrial development away from the north.

Watkins and Perry assail convergence theory on the grounds that it adopts a growth model of economic determinism and lack of policy intervention. They instead propose the notion that economic development is affected by the decisions of economically rational individuals and institutions responding to changes in demand dynamics and factor input markets. The convergence model assumes that regions perpetuate their own historic differences, but these differences will be exploited for gain by producers, collapsing economically polar regions into a uniform landscape of factor costs and manufacturing output. Economically rational actors will agglomerate in southern cities in this new epoch of capital accumulation, and this will result in the continued economic divergence among America's major manufacturing regions.

*A Product Cycle Theory of Sub Belt Agglomeration Growth (R.D. Norton and J. Rees, *The Product Cycle and the Spatial Decentralization of American Manufacturing*)*

“Core-periphery realignment” describes Norton and Rees’ shift-share analysis-informed conclusion that rapid growth industries are abandoning their traditional regional agglomeration centers in favor of the American south and west. By the mid-1970’s, less than half of American manufacturing occurred in the major northern industrial belt cities, which were gutted of their innovation functions in a “trans-cyclical” loss of jobs that moved to traditionally non-core locations outside the region (the “periphery”). Notable as well is the loss of jobs not only in manufacturing (basic/export), but also service (non-basic/residential) industries. In peripheral regions both sectors grew, underscoring the importance of manufacturing competitiveness to support the overall economic health of regions.

Historically, the south and west served “colonial” roles as extractive economies (Douglas North), and suppliers of raw materials for manufacturing conversion in core states. This traditional division of labor isolated disenfranchised peripheral regions in an undercapitalized economic trap, while the northern standard of living improved with commercial expansion. However, manufacturing activities gradually began to trickle away from core agglomeration centers,

eroding their “industrial hegemony,” which the authors insist survived well past its shelf life due to the north’s adaptive abilities, such as Jacobsian innovative capacity, a skilled workforce, and diversified industrial infrastructure.

Norton and Rees invoke product cycle theory as an explanation for the ultimate change; in the “mature” stage of the cycle, innovative processes are less critical as companies manufacture “cash cow” products at the highest possible output level and lowest cost. The implications for labor are that unskilled workers (who lack the needed capabilities that might have been helpful in Jacobs’ “new work” theory of line-work level innovation), can be found more cheaply in peripheral states. The exportation of manufacturing from core states forced companies to search for new products in order to benefit from the first two stages of the product cycle.

The authors’ shift-share matrix compares industry growth, based on a specific factor (labor, for instance), between an overall and a constituent region. Starting in the 1960’s, the characteristic industries of the core region declined nationally but grew for peripheral states (which saw a marked increase in standardized fabricating activities, and eventually high technology growth activities). Ultimately, technological innovation (regardless of where it was generated) allowed peripheral agglomerations to grow, underscoring more the importance of productive efficiency in manufacturing existing products than the role of technology as a research and development driver for creating new products. As such, peripheral endogenous growth was based on the comparative advantage of agglomeration economies in manufacturing rather than research.

As production grew, however, innovation inevitably sprung from these regions. Oil industries along the Gulf Coast gave rise to their own innovations, as did the federally-supported aviation industry in the great plains and California. “Import substitution” in these regions also accounted for their economic ascent, as did a reputation for “favorable” business climates that encouraged a growth environment for agglomeration economies. The changing manufacturing ecology also included intra-agglomeration urban-to-suburban movement of production activities, as cost advantages accrued to firms operating in lower-rise facilities where land was cheap. According to the authors, this has forced economists to rethink traditional models of behavior for agglomeration economies in the context of “metropolis-hinterland dynamics.”

Spatial Dynamics of Agglomeration Economies: A Firm-Level View (Barry Bluestone and Bennett Harrison, *The Deindustrialization of America*)

The 1950's and 1960's saw the rise of American corporations as dominant actors in the global commercial environment. In the same postwar period, Japan and Germany, on orders not to remilitarize, funded the development of corporations. America initially exploited a competitive "blue ocean"<sup>9</sup> for the twenty years it took those countries to ramp up capacity, efficiency and innovation. By the 1970's, however, Japan and Germany were emergent corporate powers and America suffered as a result of lost competitiveness and an increasingly dire fiscal situation. American firms' export strategies facilitated this phenomenon, using a short-sighted approach in which proprietary knowledge was sold to foreign firms to develop markets, with royalties accruing back to American companies. This policy, along with global linkages for co-production, was competitively unsustainable because freewheeling distribution of patent technologies theoretically allowed countries to move ahead in innovation without the attendant investment in research or education, according to the authors.

Unwittingly complicit in their own destruction, American firms invested in overseas operations that competed in their own markets; steel is one example, and the resulting "dumping" of cheaper steel on American markets compelled the Carter administration to create a price floor. Ultimately, these unwieldy American corporations could not out earn their own cost of capital, and they responded by both pursuing aggressive cost cutting measures (mainly cheaper labor) and trading subsidiaries among themselves like stocks. High bank loan interest rates produced a credit squeeze that compelled companies to look for investment capital elsewhere, forcing them to use the stock markets (in which falsely high valuations and the addition of unrecoverable assets to net worth inflated stock prices). A new managerial regime developed in which subsidiaries had to exceed a "hurdle rate of return" in order to avoid being sold, but the profitability of many subsidiaries was held artificially low by the overhead requirements of conglomerates that bought them, and cross-subsidization of underperforming units. The authors maintain that companies also diversified their asset portfolios by investing in completely unrelated industries, and merged with one another to capture cost savings from eliminated institutional redundancies.

The social fallout was vast: the increasing money supply that resulted from corporate credit lines exacerbated inflation; branch plant closings were authorized by “absentee owners” without ties to local communities; the buying up of small, family-owned businesses changed the small business landscape; corporate “colonization” of the American south was undertaken by northern firms. Pressured by a squeeze on profitability, companies began to address their biggest cost, labor, by shifting skill-intensive production away from cities with a history of labor organization, and towards the American sunbelt. Parallel production and multiple sourcing allowed companies to benefit from vendor competition. “Runaway shops” appeared in Taiwan and Singapore, while “little Detroits” and other “maquiladoras” appeared in the US-Mexico border region, an opportunity created by a government loophole that sought to provide companies with alternatives to offshoring, according to the authors. Free trade zones were created around the world, and in America around transshipment points. A later incarnation of this trend was the “urban enterprise zone,” charged with the more socially-minded economic development mission of improving inner cities in a latter-day incarnation of the universally maligned “urban renewal” program.

The bargaining power of labor organizations over multinational conglomerates diminished through control of operation information that withheld profitability measurements on individual plants, according to the authors. Automobile manufacturers standardized work by splitting processes along the production chain, enabling individual elements to be moved around easily in a search for the most cost-favorable environments. Companies often seek headquarter cities with a good “business climate” (few restrictions on the relocation of production, tax incentives, low minimum wage and social wage, et al.). This far-flung network of operations, mobile factors of production coordinated under a single, physically absent management regime, is the embodiment of Frances Cairncross’ “death of distance.”<sup>10</sup>

High Tech Industry and Regional Agglomerations (Ann Markusen, Peter Hall, and Amy Glasmeier, *High Tech America*)

Working from the assumption that innovative high tech industries in their early stages of development tend to cluster in certain regions, the authors map an American high tech landscape in which there are five major centers of agglomeration, multiple nodes of congregation within them, and five lesser areas of concentration. “Regional agglomerations” owe their growth to

attractive externalities, whereas “metropolitan agglomerations” grow because of labor market and business conditions. To qualify for inclusion in the former, a center must have both a critical volume of high tech jobs, but also a significant share of the US’s overall high tech jobs, as measured by location quotients. Within these major regions, there are also minor states, indicating a “spillover” effect of high tech growth and establishing a productive hierarchy. Examples include New England, where Boston’s Route 128 corridor has the highest concentration of high tech jobs in the region. Nearby New Hampshire also benefits from the core by having a share of high tech production, indicating that agglomeration economies may well be defined by further flung boundaries than previously assumed.

Within these larger agglomeration economies, a distinct hierarchy perpetuates. In the West, California has a large share of the region’s high tech employment and a diversity of industries, whereas Arizona has a narrower base of only three major industries which account for half of the state’s high tech jobs. Within the Gulf State region, including economies driven by oil/petroleum (classified as “high tech” by the authors) and aerospace (driven by military investment), Texas and Oklahoma have a more diverse profile of high tech employment than Louisiana, which is dominated by electronic components (NEC) and petroleum refining. In the development of high tech industries, the authors note that older core industrial states experience growth as long as their older industries stay healthy. Between 1972 and 1977, New Jersey lost high tech jobs because it was home to many older, slow-growth high tech industries; the same situation holds for Illinois, in which high tech industries like machining grew relatively slowly. On the contrary, newcomers to the high tech landscape, such as Colorado, Utah and Minnesota, started with smaller manufacturing bases and were not beholden to the old industries of the core regions.

Within regions, it is important not to impulsively link peripheral-state growth with that of the core state (Arizona vs. California); the authors state that some of Arizona’s growth originated from Midwest-owned firms, a pattern that closely follows general population migration characteristics. There is evidence to suggest, however, that “internal dispersion” does account for the intra-regional movement of jobs, but the authors are less convinced that substitute commodities in new regions displace, rather than relocate, jobs in the old region. They are also unconvinced that spin-off branch plants in newer regions are often the first to be closed while

firms are less likely to shut down operations of older plants in core regions. However, spin-off companies, those that originate from but are no longer an institutional part of their original firms, have accounted for growth in places in the vicinity of their core regions, like the Dakotas (Minnesota), Georgia (Florida) and Idaho (California). Some agglomeration regions tended towards outward growth (Los Angeles city grew more slowly than Orange County and San Diego; New York City lost jobs while the Newark, Nassau and Jersey Coast regions gained; San Francisco lost growth to San Jose and Santa Rosa; Denver to Boulder). Other regions saw a contraction of job growth back towards core areas (Boston performed equally well or better than its regional neighbors; New York has recently outgained its surrounding regions).

The authors have developed a theory of high tech location, based on a synthesis of traditional location theory and Schumpeterian innovation cycles. Among the hypotheses proposed are that high tech growth occurs in areas with good airports, good climate, business services (external economies), free-enterprise culture and funded research, all critical elements driving agglomeration. Traditional location theory overlooks the value-to-weight ratio of high tech and land cost, but the authors do draw on Alfred Weber's agglomeration theory, and credit modern location theorists with providing explanations for decline, but not growth. Aggregate patterns of growth, assumed factor significance uniformity between regions, and failure to recognize history are also pitfalls that lead to false high tech location theories concerning agglomeration.

### Conclusion

Given their dynamic nature, agglomeration economies are subject to a variety of complicated factors and interactions such as political history, resource endowments, cultural differences and entrepreneurial initiative. Their study is an important continuing field of inquiry in efforts to explain and plan for structural macroeconomic phenomena. The work of scholars has shed multiple perspectives on these matters, each a window on the prevailing academic thought of the day. The history of agglomeration scholarship is a clear, tightly-woven progression that has built on seminal theories and introduced new perspectives. In moving forward, this perpetually changing topic will demand consistent academic reevaluation and robust scholarly dialogue.

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