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Title

Theories of Labor and Industrial Location

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<https://escholarship.org/uc/item/0r257599>

Journal

Berkeley Planning Journal, 8(1)

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Publication Date

1993

DOI

10.5070/BP38113088

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Theories of Labor and Industrial Location

Edmund A. Egan

In the past 20 years, the threat of competition from low-wage countries in the Third World has been a recurring theme in the discourse of American economic policy. After two decades of job losses in the key manufacturing sectors of the postwar economy, as we strive to understand the new dynamics of metropolitan labor markets, regional formations and shifts, and try to plan for our economic future, many are quick to point to high American wages with a kind of fatalism.

Notwithstanding the fact that most of the real competitive ground has been lost to other developed countries, it is the recurring image of a Korean or Mexican worker, willing to work for a fraction of American wages, which continues to haunt debates in a number of fields: trade policy, where opposition to the North American Free Trade Agreement (NAFTA) is precipitated by a desire to protect higher-wage American workers; education policy, where a workforce prepared for the "high-tech jobs of the future" is widely seen as an imperative even before these jobs exist *en masse*; social policy, where excessive taxation and regulation, producing an "unfriendly business climate," can ostensibly drive industries to the far corners of the Earth.

Meanwhile, populisms of the left and right try to build the negative consequences of deindustrialization—closed factories, stagnating living standards, displaced workers—into a political agenda. For the left it is a matter of giant corporations unilaterally abandoning the social contract, and industrial communities, in the crass pursuit of profits and low-wage, exploitable labor; for the right the culprits are unions, overly generous social programs and protections, and unfair competition and foreign lobbyists in Washington. Both argue for a new government response: the left-populists tend to want plant-closing legislation and more generous worker-adjustment programs; the right-populists tend to favor tariffs, import quotas, and directing the public sector to "Buy American." In the center one finds the commitment to the classic principles of free-trade buttressed by a belief that the U.S. will come to specialize in advanced services and high-tech manufacturing, and hence continue to prosper in international trade. However, the actual paths to such an economy are still somewhat obscure, and

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the political positions seeking to shape government policy under that assumption are, as a consequence, no clearer.

Behind this political confusion lies some basic questions. Why has the perennial income difference between the First and Third Worlds suddenly become the focus of so much contentiousness in the rich countries? Has the American workforce really been forced into a global labor market, in which its skills are overpriced? Will U.S. living standards decline to some global mean? Are the wages of labor really the key distinguishing features of national economies? In order to get at an answer to these questions we need to understand the relationship between the globalization of industries, and labor productivity and cost. Only in this way will we be able to really understand the changes besetting the American economy.

The field of industrial location theory has recently both revived itself through, and contributed important insights to, the consideration of precisely these questions, which link the characteristics of labor and technology to the growth and movements of industry at the global scale. In this article we will review the varying approaches to labor that theories of industrial location have adopted over the years. In particular, we wish to examine: what is distinctive about each new contribution, what does it add to our understanding of economic-geographic processes in general, and how does it permit an understanding of some particularly interesting questions for which other perspectives do not?

Different traditions in economics have approached the question of labor in different ways, and it is not surprising that the approaches to economic geography which they have engendered have conceptualized the locational questions of labor in different ways as well. For example, the formal achievement of the neo-classical synthesis in economic theory is to conceptualize the economy as a web of institutionally identical markets differentiated only by their parameters of demand and supply. They are institutionally identical in that they all involve the same basic pattern; the exchange of a commodity for money. Consequently, labor is treated as one market among many:¹ it is a homogeneous "commodity" which has particular supply and demand schedules which determine its price and its quantity traded.

On the other hand, the melange of unorthodox institutional economists in the American tradition have often aimed their most powerful attacks of the neoclassical tradition at its treatment of labor (Veblen 1889, 1921; Farkas and England 1988). Instead of viewing labor as just another commodity exchanged in markets, they have stressed its particularity, and the institutional contexts in which labor skills are developed and by which workers are allocated to tasks: the key observation is that these institutions are not always markets. And, of course, labor occupies the pre-eminent place in the Marxist analysis of capitalist

production. In it, labor-power is a unique commodity, the only commodity whose consumption (work) produces more value than is required to produce it (the worker) (Marx 1967: 167-76). Consequently buying labor-power, setting it to work with raw materials, tools, and machinery, and selling the output, is the source of the capitalist's profit and money for future investment, and hence the essential habit of capitalism.

In order to understand the variety of ways in which labor has been conceptualized in the industrial location literature, we will need to discuss the general trajectory of that corpus. Essentially it has passed through three phases: the first, or "classic" period, in which firm location was presumed to be determined as the minimization of the sum of production and transportation costs (Smith 1971); a second, in which the evolving organizational features of the modern corporation were presumed to be the driving force in its location, and hence regional development (Hamilton 1974, Watts 1987); and a third, in which the Marxist conception of the dynamic relationship between class struggle, competition, and technological change principally determines the ever-changing matrix of inter-industry linkages that underlie the location theory of the first period (Storper and Walker 1989). It would be wrong to suggest either that these three schools are entirely distinct, or that they constitute a teleological progression; in fact the three presently co-exist rather uneasily, each contributing its particular theoretical and analytical insights into industrial geography.

Alfred Weber, who originated the location theory of the first period (Weber 1929) approaches the issue of labor in a typical economic fashion, as a homogeneous input into a pre-specified production function.² Labor's primary interest to Weber, insofar as location theory is concerned, lies in the fact that it is one of his two regional locational factors, or firms' costs which typically vary over space. The other is the cost of materials and energy, which leads into his immediate question of transport orientation and finding the minimum transport-cost point as the starting point for empirical locational analysis.

While Weber admits that overall labor costs can vary for two reasons: one because of differing levels of labor efficiency and/or wages across space, and two because of differing forms of labor organization and types of machinery with which the labor is equipped (Weber 1929: 96), only the first figures into his theory of labor orientation. The only important spatial variable is the wage rate. Moreover, Weber sees these wage rates being determined over broad regions, rather than simply varying from town to town; furthermore, he argues that these regional wage differences are fixed in time. Lower wage rates may move the optimal firm location away from the transport cost point (to another region) if the associated savings in labor costs make up for the

increase in transportation costs. Labor, however, is clearly subordinate to transportation costs in the Weberian model.

In general, one can make a few generalizations about the relationship between labor and location in the classic location theory tradition, which are in many ways true for its treatment of all of the factors of production. First of all, as Weber maintains, the spatial distribution of labor, its productivity, and its wage rate all should be presumed to exist *a priori*, not only to the locational decision of the firm, but to location theory itself. In other words, they are the "givens" of the locational problem; of course in reality they are the products of earlier locations. Now, this abstraction may be fine if the point is only to understand a single firm's locational decision, given its spatial context, but it has obvious weaknesses for a theory of regional change. Moreover, this may have been a worthwhile assumption during the first stages of industrialization, but at this point, regional theory cannot simply view labor as an agrarian inheritance, but should try to understand how particular types of labor (and wage rates) are in fact legacies and deposits of early waves of investment and disinvestment (Massey 1978).

Secondly, even the terms "types of labor" or "skills" is foreign to this tradition. Why? Because if labor is exchanged in a single market at a single price (or, to put it another way, if the market is only segmented spatially, in regional labor markets), it must be undifferentiated, implying anyone can do anyone else's job. And, if it is not exchanged in a single market at a single price, then the entire geometry of the Weber problem is confounded, and one cannot reduce the labor question to one of wage rates.

The closest we get to a positive connection between skills and location coming out the classic and corporate perspectives is found in the profit/product life cycle model (Vernon 1960, 1966; Rees 1979; Markusen 1985). This model attempts to describe the unprecedented decentralization of industry in the post-war period, particularly since the 1960s, through the evolution in production and organization of a product/industry as it passes through a life cycle of rapid growth, maturity, decline, and obsolescence. New products are seen as the outcome of product innovations which are presumed to occur in large metropolitan areas; moreover, these areas have the right kind of agglomeration economies, for the firms which will produce the product at first. This is true, it is argued, for two reasons: first, the scale of production is quite small in the beginning, and consequently, the firms will be unable to internally provide the necessary raw materials and services. They will, therefore, tend to locate in those cities where these products can be easily obtained. Secondly, in the early stages of an industry's life, the process of production itself is liable to be subject to a great deal of trial and error, as different techniques are experimented with: this means that the workers will have to have a sufficient under-

standing of the production process *in toto* so as to usefully experiment with their work. The workers need to be able to perform a variety of tasks; they have really quite different jobs than assembly line workers who perform standardized tasks repetitively. What this amounts to is a reliance, in the early stages of the cycle, upon *skilled labor*, or labor required to and capable of performing a variety of tasks. This is a new dimension in the equation linking labor and location. The spatial aspect of the product life cycle model relies directly on the notion of urbanization economies (Hoover 1937) to explain location in its first stage, and the key element here is the large, diversified labor pool with a variety of skills. This is a direct kind of "skill-oriented" location unlike anything found in Weber's theory.

Moreover, this is only the first stage: the second stage finds the product in a stage of heightened, and rapidly growing, demand. Firms in the industry have to adjust. In the model this involves the rationalization of the production process in several dimensions: standardization of tasks, vertical integration through the internalization of service, managerial, marketing, and material requirements, and the pursuit of economies of scale. The firm is now free to locate at a minimum cost point, and is now in fact forced to, owing to increased price competition. Accordingly, the model predicts a decentralization away from the urban agglomerations toward low-cost labor markets with a paucity of external economies, skilled (or organized) labor, or local suppliers, in a process known as "industrial filtering" (Erickson 1976, for example).

The second stage also implies an interesting (and new) theory of rationalization, labor demand, and location. The growth of the product's market (or output, at the level of the firm) is tied up with an extremely specific form of technological change: suddenly the industry changes from "skill-oriented" to "low-skill-oriented," and its locational patterns change accordingly. The rationalization of the labor process, by itself, alters the firm's set of factor demands and, hence, its locational orientation. The fact that the product life cycle has since been criticized as being overly deterministic (Storper 1985, to cite but one), has not deterred many writers from pursuing the connections between macroeconomic patterns of sectoral demand, industrial organization, technological change in production, labor demand, and location; indeed these are today considered the strongest determinants of change in both labor markets and industrial location (Schoenberger 1989).

It is this, almost inadvertent, introduction of considerations like the labor process into the geographic literature which made the product life cycle a seminal moment in the history of industrial location theory.³ Later writers, especially those in the Marxist tradition, who subsequently endeavored to introduce the labor process as a category into debates in industrial location were in many ways both building on, and trying to re-think, the product life cycle.

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One such effort, which is many ways like a Marxist version of the product life cycle model, is the New International Division of Labor (NIDL) thesis (Fröebel *et al.* 1980). This theory arose to explain the rise of some types of manufacturing in the Third World, as for many years the debate in the Marxist literature oscillated between the prediction of an eternal future of agrarian dependency for the Third World, and a fading conviction that the dynamic powers of capital accumulation would eventually reproduce European capitalism in its colonies.⁴ In fact, Third World industrialization has resulted in some countries altering the composition of their foreign trade—exporting relatively more processed goods and less primary products—but such investment has not always spurred new development in a way characteristic of early capitalist development, nor has it broken the existing bonds of dependency, as multinational corporations based in the West make most of the investments, at their discretion.

What has produced such an outcome, and what are the consequences for development in the First and Third worlds? The NIDL suggests three main reasons for the movement: one, the amassing of population in the Third World metropolises; two, the dramatic new capacities of information and communication technologies; and three, changes in the capitalist labor process in the First World. The first phenomenon essentially guarantees a supply of low-wage industrial labor in the Third World. The second technologically allows the spatial separation of parts of production processes, by permitting their integration through electronic means. The third, which more closely relates to our concerns in this paper, echoes Braverman's (1974) argument, by maintaining that the general tendency in capitalist production processes in the 20th century has been in the direction of a finer division of labor and a greater separation between the conception and execution of work—with the former becoming the ever-growing domain of management and industrial planners, and the latter becoming ever-more standardized and devoid of flexibility, independent mental effort, or skill. In spatial terms, *the standardization of worker tasks directly and independently increases the locational mobility of production*. The very definition refers to the process by which a skilled individual's intuition and craft is replaced by a set of repetitive instructions to one or many workers who lack the skill. The localized institutions which tend to produce skilled as opposed to unskilled labor, and hence upon which its employers tend to become locationally dependent, are made obsolete by the reduction of skill in the production process, and consequently the dependent industries are locationally freed to search for low-skill, low-wage labor.

Like the product life cycle model, the NIDL hypothesized the dispersal of manufacturing to peripheral locations, but in a Pyrrhic way, in that the work would always be low-wage, always insufficient to absorb the vast labor surpluses of the Third World metropolises, and

unlikely to spur endogenous development. As with the product life cycle, the core/urban regions would lose their manufacturing but retain their role as innovative or control centers. Moreover, in the same way that the NIDL tried to rectify the geographic over-determinism of the agrarian-based dependency literature, the product life-cycle opposed the "mainstream" core/periphery models. Re-thinking the relationship between the labor process and location was taken to be necessary to rectify the over-determinism of the old models, in both theoretical traditions.

The rapid collapse, in the 1970s and 1980s, of the traditional manufacturing regions in Europe and the U.S., with the concomitant rise of manufacturing in the Sunbelt and parts of the Third World, have led an incipient "spatial division of labor" school to argue that locational movement in this case was as much a desire to reassert control over the labor process from a change-resistant, unionized, labor force, in the face of restructuring pressures, as it was simply a search for low wages (which had always been present in those regions). It has been argued that this movement was business's way out of the "social contract" with unionized labor, in its search for greener, and presumably more profitable, pastures (Massey 1984, Clark 1986, Gordon 1977, Storper and Walker 1983). This view shares much with the NIDL's conception of the relationship between location and the labor process, but emphasizes the key role of worker/management conflict over control of the production process, as the bargaining power of labor is partly determined by the ease with which it can be replaced. Furthermore, these writers are generally less likely to engage in the same type of global locational prediction that the NIDL proffers, preferring instead analysis at the level of the individual industry.

There is one other key recent school which has introduced new ways of thinking about labor and location: this is the flexible specialization approach developed by Piore and Sabel (1984). The thesis broadly accepts the Bravermanist notion that, for a long time, the standard and most effective way of increasing productivity in the labor process was through de-skilling and task and machinery specialization on the assembly line, under the aegis of the giant corporation. However, they point to a time in the 19th century when craft-like production methods, featuring a rather light division of labor and workers with a wide array of skills, not only predominated but were instrumental in increasing manufacturing productivity. At a certain point, associated with the creation of the American mass market, the two "paths" crossed and the lower unit costs achievable with Taylorist mass production methods rendered the craft methods uncompetitive by comparison.

However, the key point Piore and Sabel make is that the "divide" in which one set of organizational methods comes to dominate another is

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not the inexorable effect of technology, or capitalism, but only a response to a given set of market conditions described by dimensions like size and stability. In other words, mass production was the more appropriate form of production for a stable mass market, but for rapidly changing niche markets, the investment in the large-scale, specialized machinery necessary to do mass production would be unjustifiable: the large, dedicated machinery would be obsolete before it could be amortized.

This line of argument is aimed directly at the view that the slowdown of manufacturing productivity in the advanced world, with the accompanying crisis of the post-war social contract, is sounding the death-knell for manufacturing in these countries, and the only solution is to switch into entirely new, post-industrial activities. Rather, Piore and Sabel attribute the crisis of mass-production to stagnation in the mass markets which sustained that form of organization, and contrast it with the dynamism of two developing manufacturing regions in Italy, Emilia and Romagna, whose firms target rapidly changing niche markets, in a variety of sectors, using a combination of craft production methods (weak division of labor), small interdependent firms (usually started by a production worker), and new programmable general-purpose machinery. This form of organization, they argue, promotes regional development (as the firms tend to cluster and have strong intra-regional multiplier effects), continual technological innovation (as the firms are constantly improving on old products before larger competitors can catch up), and skill upgrading for labor (as there is a reconnection of the conception and execution of tasks, learning by doing, and the weak division of labor). Furthermore, regionally-based trade associations constantly disseminate new product and export opportunities to the participant firms. The new technology and the crisis of mass-production produce a "second industrial divide" in which there is some uncertainty in what the future organization of production will be, and some room for experimentation and success with methods which are more beneficial to labor. In essence, flexible specialization argues that the "new competition" (Best 1990) is based on getting newer and better products to market faster, using customized labor processes on programmable machinery, rather than finding the cheapest way to make standard products on standard technology. It is as if the product life-cycle could constantly restart itself, by continually tapping the possibilities of product innovation.

If this thesis is accurate, and a large recent literature has produced compelling case studies which mirror Piore and Sabel's findings for Emilia and Romagna, then we are truly a long way from Weber's conception of the labor/location relationship, in which the cheapness of labor is the only factor which induces locational movement. We are also quite a distance from the product life cycle model, with its vacillations between dependence upon, and independence from, "skilled"

labor. We are even quite far from the Bravermanist conception of the labor process, embodied in the New International Division of Labor thesis, which was fixated on the progressive de-skilling of work and the expanding locational mobility of production. Instead, skilled labor, and the local institutions that produce and sustain it, appear to be able to survive to the extent that they can translate their skill into better and more responsive products, and keep one step ahead of price competition.

ACKNOWLEDGMENTS

The author would like to thank Anno Saxenian, Lisa Bornstein, and the Berkeley Planning Journal reviewers for helpful comments on earlier drafts of this paper.

NOTES

¹Except in labor economics, of course, where the assumptions are relaxed. However, specializations in economics tend to take as their starting point the competitive general equilibrium model, which is very abstract, and then introduce greater realism in only one way. In this way location theory introduces the realism of transportation costs but ignores the realism of the heterogeneity of labor, which labor economics develops.

²For the most part. Weber, on page 22 of the 1929 translation, does address the precise objection of later writers, when he says, "The differences of the cost of some types of labor may of the same nature [owing to natural factors] (differences in the hereditary qualities of the population), or they may be the result of a certain cultural environment (differences in the standard of living, or in acquired productivity of labor) . . ." But, later on the same page, he dismisses this fact from the scope of his theory, saying, "It is apparent that every aspect of locational factors which is not of a natural or technical, but of a social, character cannot be an object of pure theory which is to be independent of particular economic or social conditions." It is interesting that the way labor is used in the theory is implicitly considered **not** to be dependent upon particular economic and social conditions.

³In fact, the earliest writings on the product life-cycle treated the labor process very superficially, with only a simple, and a *priori*, distinction between "high-skill" and "low-skill" work.

⁴See Palma (1977) for an interesting and thorough review of this literature.

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