



# Regulation and Flexible Specialization as Theories of Capitalist Development

Challengers to Marx and Schumpeter?



RICHARD A. WALKER

The Regulation and Flexible Specialization Schools are currently the leading contenders for theoretical hegemony in economic geography. Both have been part of a vigorous and salutary debate about the nature of contemporary capitalism and a stimulus to new ways of thinking about industrial and social history—to which I readily acknowledge a considerable debt (cf. Storper & Walker, 1989). Despite this contribution, both schools are seriously flawed in their

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understanding of the structure and dynamics of capitalist development and cannot sustain their theoretical ambitions to replace the classical tradition of political economy, particularly the systems of Marx and Schumpeter, as a coherent foundation for understanding the revolutionary evolution of the capitalist mode of production.<sup>1</sup>

This is not to say that we simply go back to the Marxist verities for all the answers to questions that now perplex us about the changing face of capitalism across the world today; but I do insist that we not hastily reject a large body of deep insights into the workings of the capitalist economy. Marx had a number of things right about the nature of capital, such as his grasp of class, accumulation, and the labor process. Schumpeter ("the bourgeois Marx") never succeeded in overthrowing the Marxian system, but his attention to technological development, industrial epochs, and business cycles continued more in the tradition of historical materialism than he would have liked to admit. As circumstances change, we must continue to amend and update important parts of the tradition to keep abreast, as the world economy shifts into a new post-Fordist epoch. But it will not do to jettison too many useful tenets of political economy in the search for a plausible reevaluation of the past or a shining new image of the capitalist future.

I wish to condense, from the vast range of disputes raised in connection with the movement from Fordism to post-Fordism, four elements of a theory of capitalist development seen through the lens of Marxist theory, with a Schumpeterian twist. After an introduction to the Regulation and Flexible Specialization Schools, I begin with the importance of industrial revolutions in providing a foundation for major historical epochs of capitalist growth, and I contrast this to the truncated versions of history presented by the two schools, centering on the rise and fall of Fordism and mass production. This is followed by the case for the a broad-based industrial revolution taking place today, using the concept of the labor process as a way of organizing the discussion in a way that is more wide-reaching than the concept of labor process used by the Regulation School and more grounded than the vague notion of *technological paradigm* employed by the Flexible Specialization writers.

Next, I argue that industrial revolutions are necessarily entwined with the uneven geographic development of capitalism. Regulation

and Flexible Specialization theories recognize the importance of geography, but chiefly as a container for variants of national Fordism and local industrial districts. In my view, new methods of production and renewed relations of production grow up together and diffuse with the rise and fall of industries and territorial production complexes, at various spatial levels from the local to the national. Finally I consider the process of economic growth and crisis, by which one epoch of expansion dies out, to be followed by another. The Regulation School has an impoverished theory of growth and crisis, and the Flexible Specialization School has none worthy of the name. In contrast, Marx's theory of the destabilizing drive to accumulate and advance the forces of production offers a better fit with the historical evidence.

These are all daunting fields of economic theory and historical-geographic research to which one can hardly do justice in a brief chapter. Nevertheless they need to be posed in one sweep in order to grasp what the fierce debates over Regulation and Flexible Specialization, Fordism and post-Fordism, are ultimately about. And the fundamental challenges to Marxism—and all classical political economy—have to be admitted, with the proviso that there are things about all the above issues that remain poorly understood by everyone, regardless of their theoretical and political allegiances.

Regulation theory and Flexible Specialization theory are now well-known, but their overall intentions and position in relation to Marxism and prior economic theory need to be indicated. Both are grand theories of capitalism that attempt to grasp the dynamics of economic change in new ways and to reperiodize the last 200 years. I shall indicate their relevant propositions about the economy as the argument of the chapter unfolds, but some general observations can be made at this point.<sup>2</sup>

Regulation theory has two central concepts, the regime of accumulation and the mode of regulation. *Regime of accumulation* refers to the basic economic conditions of production method, income distribution, and effective demand, whereas *mode of regulation* signifies the institutional framework by which balance and stability are maintained, in order that the accumulation process can proceed for a period without structural crisis and transformation to a new regime. Regime of accumulation and mode of regulation play a role analogous

to forces and relations of production in Marxist theory, and most of the key concepts deployed by Regulationists, such as Gramsci's Fordism, are taken from the Marxian corpus.<sup>3</sup>

Regulation theory has allowed a critical debate on the nature of contemporary capitalism to take place without anyone having to say the troublesome name of Marx and without having to flog to death old horses such as crisis theory and value theory. Methodologically, the Regulationists have been keen to avoid the relentless determinism and overgeneralization of so much Marxist theorizing, as well as the neglect of intermediate concepts that link the structural logic of capital with the many concrete forms of capitalism. Theirs is the language of the middle ground.<sup>4</sup> Regulation theory makes considerable sense on this score, yet an open-minded methodology serves to frame theory and cannot substitute for theories that seek to explain events. The Regulationists are aware of this, but ardent followers may easily forget that a litany is no substitute for hard answers to difficult questions (cf. Walker, 1989c).

Flexible specialization (Flex Spec) theory has also called Marxist orthodoxy into question on several crucial points. It has challenged the ideas that mass production, large firm concentration, geographical dispersion, and the deskilling of labor are necessarily the culmination of capitalist laws of production and accumulation, thereby forcing a reappraisal of some poorly theorized tenets of Marxian faith. In particular, Flex Spec has helped to recover a lost history of craft work and small-firm industrial districts as complements to Taylorized production in large factories and giant corporations. However, it goes further, in claiming that flexible specialization and mass production are alternative paradigms and that flexible specialization has reemerged as the dominant form of production in the late 20th century, after passing over a "second industrial divide." Flex Spec offers a more technologically supple form of economic development, but it needs to be nurtured through careful institution-building to promote interaction and trust at the regional level (see, e.g., Brusco & Sabel, 1983; Piore & Sabel, 1984; Sabel, 1989; Sabel & Zeitlin, 1985; Scott, 1988a, 1988b; Scott & Storper, 1990; Storper, 1989; Storper & Scott, 1988).

Flex Spec theory cannot compare in scope with Regulation theory, despite its ambitions. Its indifference and even antagonism to Marxist

foundations are a serious handicap, insofar as they deny the relevance of concepts such as class, mode of production, or laws of historical development (e.g., Piore & Sabel, 1984; Storper, 1987). Advocates of flexible specialization share with Regulation theorists a concern for middle-level concepts that allow for geographic divergence and temporal breaks in the trajectory of development, and they stress turning points in history in place of the grinding logic of much orthodox historical materialism. Nevertheless, methodological openness often turns into a voluntarism and eclecticism, which comes closer to advocacy than explanation.<sup>5</sup>

#### INDUSTRIALIZATION AND EPOCHS OF CAPITALIST GROWTH

Regulation and Flex Spec theories portray capitalist history in a remarkably similar fashion: It all turns on the emergence of mass production, and in each there are three long periods. For the Regulationists, an early epoch of extensive accumulation or competitive regulation, up to about 1914, is followed by the explosion of mass production derived from Frederick Taylor's and Henry Ford's revolution in working methods, and a neo-Fordist epoch is emerging in our own time. The middle period is divided in two, with an early interregnum in which Fordist production methods are put in place, but no comparable Fordist mode of regulation exists to balance production with mass consumption; this comes with the post-World War II labor accords and social welfare state (Aglietta, 1979; Boyer, 1986b; Lipietz, 1987).

The Regulation School's theory of capitalist growth rests on three precepts: that capitalists try to expand productivity (to extract more surplus value); that consumption must balance production (to sell a given output and realize its value); and that large firms have come to dominate industrial production and distribution (a centralization of capital). Fordism is defined by its characteristic methods of high-productivity labor (Taylorist division of labor and the assembly line), means to absorb the output of mass production (the rising, productivity-linked wage), and mode of competition (oligopoly among large firms).<sup>6</sup>

The key period in the scheme is the postwar "Golden Age" of High Fordism, which is preceded by an epoch of Fordist production without the corresponding regulatory mechanisms of mass consumption.<sup>7</sup> The theory of Fordism was a response to the postwar situation in Europe, which was swept by the triad of Fordist production, the giant corporation, and mass consumption coming from North America. Aglietta (1979) then read this experience back in time in his path-breaking treatment of U.S. history. Unfortunately, Aglietta and his followers fall into three glaring errors in their analysis of capitalist development, clearly visible in the evidence from the economic history of the United States. First, they misread 19th-century economic history as lacking in significant mass production and mass consumption, when it is shot through with technical advances and the consumption of industrial goods. Second, they take 1929 to be a crisis of underconsumption—that is, mass production outrunning mass consumption—when consumption was high and rising in the 1920s. Third, they portray monopoly capital, CIO-type industrial organizing, and the Keynesian state as necessary to regulation, when the correspondence between production and consumption has been achieved through other methods, such as agroindustrialism and suburbanization (Brenner & Glick, 1991; Duménil & Lévy, 1989b; Page & Walker, 1991; Walker, 1977).<sup>8</sup> I will take up these shortcomings again later in the discussion.

Flexible specialization theory's history of capitalist epochs is vaguer, but it amounts to this: an early period of craft production up to the mid-19th century is gradually replaced by the mass production paradigm and modern corporation, which are eventually stabilized at their peak by the Keynesian policies of the welfare state. All this is overthrown in the era of flexible specialization, beginning in the 1970s—the key historical moment in this scheme. This is capitalist history reduced to a trilogy of a distant craft era (a virtual Virgilian Golden Age), a well-known Middle Age of mass production, and an emergent future of Flex Spec. It is a myth.

Both schools center their story on a not terribly original view of mid-20th-century capitalism, shared with Keynesians and business historians (e.g., Chandler, 1977; Fraser & Gerstle, 1989; Marglin & Schor, 1989). In this view, the modern corporation, Taylorist work study methods, and the Fordist assembly revolution spread rapidly

through the 1920s; mass consumption by workers began in the 1920s but was aborted by the Depression and only secured after World War II; and the state adopted a Keynesian focus on supporting effective demand. It should be said, however, that Regulation theory was a welcome break with the then-dominant Marxist School of monopoly capitalism (Baran & Sweezy, 1966; Braverman, 1974) and its obsession with long-run stagnation—which could not explain the postwar boom satisfactorily. Yet economic history virtually stops for the Regulationists with High Fordism, whereas the Flex Spec School was vigorously trying to convince people that dramatic changes were in the offing by the 1970s.

The reason for the very spare histories drawn by the Regulation and Flex Spec Schools is that neither theory has a strong dynamic component that is able to explain the forward motion of capitalist economies. The historic breaks necessarily come as something of a surprise. Flex Spec makes a virtue of this necessity by theorizing the "industrial divide" as an unpredictable moment when the economy lurches onto a new pathway.<sup>9</sup> Regulation theory does not take its own precepts about raising labor productivity seriously before or after the Taylor-Ford revolution, which is virtually *sui generis*. It is, rather, occupied with the quietest notions of balance between production and consumption and establishing stability through a mode of regulation. It is closer to neoclassical equilibrium theory than Marxian dynamics (Brenner & Glick, 1991).

According to Marx, capitalist development rests fundamentally on the way this mode of production accelerates advances in the forces of production, a process usually called *industrialization*.<sup>10</sup> By industrialization I mean qualitative advances across a broad front in methods of working, products, divisions of labor, base technologies, and leading industries. The evolution of the forces of production yields periodic transitions sufficiently thoroughgoing to be called *industrial revolutions*. For Marx this story only goes as far as the emergence of what he called "Modern Industry," including the factory system and the making of machines with machines. It had to be left to others, especially Schumpeter, to push the matter farther along into the 20th century. Certainly the advent of Taylorism and Fordist assembly were leading components in the industrial revolution of 1890-1920, but they were not the only significant advances of the

time. Electrification (especially motors and controls), hard alloys and high-speed machining, and better cost accounting, among other things, played a big part. Similarly, the period around World War II brought a whole new phalanx of technologies to the fore, such as high-power tubes, transistors and computers, catalytic cracking, plastics and petrochemicals, and general adoption of the multidivisional corporation.

Those revolutions—or shifts in technical frameworks—occur across groups of leading industries and spread widely during the course of a regime of accumulation. This is why a history of capitalism is necessarily a history of its industries, not just of modes of regulation (Storper & Walker, 1989). Because industries develop on different technical foundations and generate widely disparate kinds of products, they are not revolutionized at the same time or in the same way, and we must therefore be very attentive to uneven development as a counterpoint to the sweeping tale of industrial revolutions (Rosenberg, 1972; Walker, 1989a). There are “base technologies,” such as machining in the 19th century (Rosenberg, 1976) or microelectronics today (Perez, 1985), which cut a wide swath across many sectors; Fordist assembly was one such revolution in methods, which touched on everything from consumer durables to World War II shipyards. But the Regulationist account of Fordism oversimplifies the evolution of mass production and the unity of 20th-century production.

In my view, the old Kondratieff cycle/long wave periodization of capitalist development, first enunciated fully in Schumpeter's (1939) masterpiece, *Business Cycles*, provides a more satisfactory historical framework than either the Regulationist or Flex Spec visions.<sup>11</sup> It is possible to speak of at least five industrial revolutions that have structured the long periods of capitalist growth since the late 18th century—not the one or two of the Regulationist and Flex Spec accounts. One can do this without the Schumpeterian notion that technological change is a matter of sudden waves of innovation and the first cause in capitalist growth (cf. Mandel, 1975; Storper & Walker, 1989).

Driving these productive advances is the logic of the capitalist mode of production. That task master, accumulation, and its overseer, competition, provoke capitalists to try to increase the rate of surplus value (improve labor productivity in several ways; intensify labor effort), reduce constant capital (materials saving), reduce the

turnover time of capital (eliminate idle time of labor, materials, machines, and finished products), improve realization (better distribution, tighter links to consumers, improved product performance), and open up new areas of value production and realization (offer up new commodities). Regulation theory has surprisingly little to say about the causes and process of technical change other than the refinement of Taylorism (Faucher & DeBresson, 1990). Flex Spec theory has equally little interest in technology, other than pointing out new forms of computer-aided machining for batch production. In general, theories of industrial divides and modes of regulation pay far too little attention to the forces of production, in relation to politics and organization.<sup>12</sup>

The forces of production do not operate as *deus ex machina*. I take the dialectic of forces and relations of production seriously, and I hold to the Marxian precept of the dominance of class relations of property and exploitation as the defining characteristic of a mode of production. Rapid technical change and industrial revolutions require the right social context, not everywhere to be found; certain social situations and capitalist class relations are more conducive to technical change than others. The 19th-century American Midwest, for example, with its wide access to land and means of production for new producers, was once a hotbed of rapid development (Page & Walker, 1991). The pace of Japanese industrialization cannot be understood without reference to class upheavals of the Meiji revolution and the defeat and occupation brought on by war (Moore, 1966). The relative slowness of British development, by contrast, rests firmly on its immobile class relations (Anderson, 1987). At the same time, industrial revolutions have a massively unsettling effect on social relations. They frequently usher in new production regimes, which are the foundation for new regimes of accumulation. The developing forces of production in crucial ways set the terms for the successive modes of regulation (Storper & Walker, 1989).

Furthermore, the exploitation of labor remains a cornerstone of capitalist production. New sources of super-exploitable labor, such as immigrants in Southern California or women in the Third Italy, and new forms of exploitation, such as temporary hiring, can cause surplus value to gush forth like a freshet amid the most worn technical clichés. Regulation theorists (e.g., Boyer, 1988a; Leborgne &

Lipietz, 1990) and Flex Spec theorists (e.g., Christopherson & Storper, 1988; Scott, 1988b) are quite right to worry about the struggle for more humane forms of flexible work and employment in the post-Fordist era (see also Standing, 1992). Nonetheless, capitalist development rests fundamentally on the creation of relative surplus value and elevation of productivity, which no amount of intensive exploitation can equal in the long run (Brenner, 1977). The character of the epoch rests in part on the core employment relation between capital and labor, but it cannot be defined in those terms alone, as Regulationist theory implies (e.g., Leborgne & Lipietz, 1988).<sup>13</sup>

Industrial revolutions are, I repeat, qualitative advances across a broad front in the ability of humankind to master the forces of nature to useful ends. This includes new methods of working, new products, new divisions of labor, new materials, even whole new base technologies. The postwar period saw not only a spread of Taylorism and Fordist assembly methods, but revolutions in agriculture, petrochemicals and synthetics, aircraft design, and metallurgy that owed little to Ford's achievements, vast though they were (Freeman, 1982; Rosenberg, 1972).

### The Labor Process and the Contemporary Industrial Revolution

Industry is a highly diverse set of activities that cannot easily be reduced to a single term. Economic theorists have tried in various ways to boil it down to "utility" or "energy flows," but the yardstick to which everyone usually returns is human labor. The reason is that whatever else production may be—horsepower, metallurgy, bioengineering—it is still a human-initiated, conceived, and conducted transformation of nature for human ends. The guiding hand of industry is human, notwithstanding the implicit contributions of nature (i.e., dependence on natural forces) and the fantastic enhancements achieved through the use of accumulated human technology. In order to comprehend industrial development, then, there is still good reason to build on the labor process approach of Marx.

The analysis of industrial progress is similarly vexed without a core concept of human labor. For example, many writers seem to use quantity of output as the defining element of industrial development, as in the terms *mass production* and *batch production* used liberally

by Regulation and Flex Spec theorists. To begin with, the crucial relation behind these terms is not mere quantity (after all, the women who sew baseballs in Haiti produce a tremendous number of them), but productivity—the ratio of output to inputs. However, measuring productivity raises a whole host of difficulties (Perlo, 1982). Above all, it requires an index of *total factor productivity* that aggregates a host of unlike things—products, materials, machines, buildings, and people. Both major indices in use, the productivity of labor and the productivity of capital, are subject to doubt, owing to the heterogeneity problem.<sup>14</sup> Nonetheless, the bottom line in industrial advance is ultimately the productivity of labor—as indicated by its continuing general use for international and intersectoral comparisons of industrial capability and progress.

Flex Spec writers have mistakenly substituted *flexibility* for *productivity* as the key variable in contemporary industrialism. Not only is the term used indiscriminately, in contrast to *rigidity* (Sayer, 1988), but it centers on a response to consumer demand, not on enhancing production in the interest of accumulation.<sup>15</sup> Flexibility is seen principally as a defensive strategy of risk avoidance in the face of fragmenting demand, increasing competition, and a stagnant world economy rather than as a means of competitive advantage and the development of the forces of production in an expanding system.<sup>16</sup>

Furthermore, flexible specialization is portrayed as an alternative rather than a complement to mass production (Piore & Sabel, 1984). Mass production is presented as a *technological paradigm*, as if it were merely an *idée fixe*, rather than a predictable consequence of successful expansion of output and productivity—the universal goal of capitalist commodity production—wherever demand and technical conditions allow. There is no evidence that mass production has been eclipsed today, only that the methods of achieving higher output and productivity of a wider variety of goods have improved (e.g., Donaghu & Barff, 1991). The challenge is not mass versus batch production, but improvements in both.<sup>17</sup>

Regulation theorists are correct to build on labor process theory, but they have taken over largely intact the narrow and one-sided interpretation of Marx put forth by Braverman (1974), as well as his obsession with Frederick Taylor's role in defeating craft workers in certain key industries at the turn of the century (e.g., Aglietta, 1979;

Coriat, 1983). Thus Fordism is defined as "Taylorism plus mechanization" (Leborgne & Lipietz, 1990). This is wholly inadequate. To begin with, it does not distinguish Fordism from any other period of capitalist industrialization: Taylor was building on a long tradition of work rationalization and detail division of labor going back to the manufacturing era of the 18th century; and mechanization had been applied to factory production from the first industrial revolution. Both developments were amply discussed by Marx (1863/1967) (Brenner & Glick, 1991).<sup>18</sup> In addition, Fordist assembly goes well beyond Taylorism and mechanization; it was, in fact, a very specific set of accomplishments in interchangeable parts, elimination of "fitting," rationalization of work flow, dedication of specialized machinery, and, finally, automation of the moving line (Hounshell, 1984).<sup>19</sup>

Furthermore, the Regulationist definition of Fordism ignores the breadth of technical change outside metal-working and assembly industries, as previously indicated. Without a broader understanding of the labor process, we are blind to the dynamics and richness of the process of technical change.<sup>20</sup> There are five dimensions to the labor process: direct labor, machinery, materials/products, indirect labor, and collective labor. Each lends a twist to the development of the forces of production.<sup>21</sup>

- The direct actions of labor—processing, assembly, transfer, regulation, and integration (Walker, 1989a)—can be improved by detail division of labor, rationalization of effort, better sequencing, improved flow, careful measurement and feedback, learning, and skills acquisition. Taylor emphasized the first two kinds of strategies; Ford attended most to the next three (Hounshell, 1984); the Japanese have added close attention to worker cooperation and learning (Sayer, 1986).
- Machinery can be applied to the actions of labor to enhance the performance of the worker or to replace some workers altogether. However, there is no one path to mechanization: Higher productivity might be achieved through either automated flow, computer-regulated feedback, or simply larger, faster individual machines (Walker, 1989a).
- Materials can be improved so the same effort yields better results. Materials are transformed according to the nature of the substances themselves; hence, progress in steel making has rested in large part on advances in metallurgy—not on Fordist-type improvements in direct labor. This is even more dramatically the case for the chemical industries or electronics.

- Improvements in indirect labor contribute to productivity by enhancing such activities as design, engineering, and software (Walker, 1985a). Furthermore the multiplication of new products, new inputs, and complementary activities generates external economies, owing to specialization, learning, efficient scope, flexibility, and so forth (Scott, 1988a; Storper, 1989).<sup>22</sup>
- The fragments of the division of labor must be reintegrated into functioning labor systems (Marx's "collective worker") through systems of industrial organization, which are themselves subject to repeated improvements in management methods and ways of cooperative working (Walker, 1988b).

The Regulation School borrows heavily from traditional French Marxist theory of state monopoly capitalism in emphasizing a restricted set of large firms and nation-states as the means of economic "régulation" (Boyer, 1986b). Flex Spec theory broke with this orthodoxy to insist on the positive contribution of small firms, regions, and networks of firms, but has been unduly wedded to the *industrial district* as the principal mode of organization today (Sabel, 1989; Scott, 1988b).

The technical basis of the current industrial transition has been touched upon from many angles, yet almost no one has tried to pull the scattering of insights together in one argument about a major advance in the forces of production on several fronts. There has been, in my view, a qualitative shift in the nature of capitalist industrialization—a new industrial revolution, whose key elements are:<sup>23</sup>

1. More efficient and creative uses of human labor
2. New and improved machinery, and especially machine monitoring
3. Better understanding, preparation, and use of materials
4. New divisions of labor in products, design, circulation, and so on
5. New forms of industrial organization and production integration.

It is not possible here to do more than provide an indicative list. Nonetheless, it is impossible to maintain the thesis that industrial methods are little changed from the high tide of the post-World War II epoch (cf. Gertler, 1988; Williams, Cutler, Williams, & Haslam, 1987). At the same time, the new industrial revolution cannot be reduced to a detached technical phenomenon, as in the popular neo-Schumpeterian



theme of the "microelectronics revolution" or "information revolution" (Forester, 1987; Perez, 1985). There is a much wider scientific-technical push taking place, which includes radically new materials as well as faster communications, better administrative techniques as well as machine capacities. Recall that Ohno's just-in-time/total quality control system evolved entirely in the absence of computers, using kanban boards (Cusumano, 1985; Sayer, 1986).

The new industrial revolution crosses the whole domain of labor, and cannot be confined to the shop floor or the mechanical industries such as machining and auto assembly. Nonetheless, improvements in direct, hands-on labor are a big part of it. Better work rationalization and intensification are important, of course, but this is not simply neo-Fordist, after the fashion of the early Regulation theorists (Aglietta, 1979).<sup>24</sup> Flexibility in the application of labor and in interfirm relations is a part of it, but so are rigidities of new forms of fixed capital, organizational networking, and mass retailing (Johanson, 1989; Schoenberger, 1990). Better learning and directly anti-Taylorist methods of creative application of labor are important, too, but there is not by any means a general revival of craft work using flexible work stations, in the manner of Piore and Sabel (1984), nor a thoroughgoing shift toward intelligent work, in the hopeful scenarios of Hirschhorn (1984) and Kern and Schumann (1987). It cannot be forgotten that many capitalists continue to rely on extreme exploitation through lower wages or driving workers harder (Christopherson, 1988; Leborgne & Lipietz, 1990; Sassen, 1988). In short, there are several competing and complementary paradigms of production available (Sayer, 1988).<sup>25</sup>

Certainly, capitalists have had to come to grips with limits to the Taylorist problematic: This means often junking simplistic notions of individual work rationalization and extreme division of labor and backing off from high automation and top-down managerial control in order to reassess the organization of labor—one step back and two forward, down different (often surprisingly different) lines of approach (Walker, 1989a). Having discovered that you can never get the labor out of production systems as a whole and that more sophisticated processes and machines benefit from more intelligent application of human labor, many capitalists have been forced to rethink how best to use workers.

The same is true of Fordist notions of rigidly linked and unstoppable flows, backed up by large inventories available "just-in-case" something goes wrong (Sayer, 1986). These have proven to be wasteful of circulating capital and expensive to retool, owing to large amounts of fully dedicated fixed capital. They are particularly inappropriate in the face of unstandardized demand or rapidly shifting technologies. Ford's revolution in mass production was so immense that capitalists often lost sight of an older principle of fitting supply to demand as a way of increasing sales, rather than the other way around (Forty, 1986). GM's Sloan was the first to demonstrate the vulnerability of Ford's Model T to product variation (Hounshell, 1984), but today this principle has been taken much further, as the Flex Spec theorists have indicated.

The relation between ordinary labor and technical innovation has become a greater focus of capitalist attention in this period, as well. As technology progresses, industrial engineers and capitalists have become increasingly aware of the rewards of pushing those possibilities as far as possible, and they have tried to build more continuous innovation into their organizational plans and ways of working. This means that the strategies of putting thought to work, harnessing indirect to direct labor, and linking today's work to tomorrow's product should be highlighted as increasingly explicit parts of capitalist rationalization of production. Yet a serious note of caution needs to be raised with regard to the oft-heard claim that the rate of innovation has gone up (e.g., Sabel, 1989). The level of technical sophistication has repeatedly risen over the course of industrialization, and the latest industrial revolution does not mean that things are moving faster; rather, because greater capability keeps pushing up against bigger and harder problems, maintaining the same rate of innovation requires a more systematic approach to technical change as a part of the complete labor process (Florida, 1991).<sup>26</sup>

### Uneven Development and the Specificities of Time and Place

These improvements are not being applied equally nor everywhere at once. This is why we commonly speak in terms of new "models" of production developed in particular places. These models combine different pieces of the new industrial revolution into concrete packages



of innovation and workable production. In short, the geographic specificity of industrial activity and technical change must be confronted directly (Storper & Walker, 1989).

For example, the Emilia-Romagna model of flexible specialization in metal working is the result, in good part, of improvements in machinery for batch production, better attention to product design, development of labor skills, and better interaction among a network of workshops. The Japanese model of just-in-time production is a way of reducing idle time for capital, increasing work effort (especially the intelligent application of workers' time), and more effective sales (through product quality control and response to demand), among other things. The Silicon Valley model, if you will, is one of harnessing creativity to the exploration of the possibilities of the technological base of designing and etching microcircuitry on silicon chips, coupled with explorations in computer design and programming (software), to the end of multiplying commodity offerings, improving commodity performance, and lowering costs.

There are other important models besides the Holy Trinity. There is Fujitsu's link of product design and manufacture within one big firm (Kenney & Florida, 1988)<sup>27</sup>; the California model of industrial agriculture (Fitzsimmons, 1986); the West Los Angeles model of armament production involving hyperinnovation of limited-production military products (Markusen, Hall, Deitrich, & Campbell, 1991); the Korean model of large ship building (Amsden, 1989); the German model of steady skill development, especially in metal working (Katzenstein, 1989); or the Ikea-Benneton model of merchant subcontracting and targeted retailing (Gardner & Sheppard, 1989).

There are thus a great many important areas of advance in capitalist industry that the Italian model of flexible specialization does not comprehend, contra Sabel's (1989) embracing sweep of everything into that particular basket. Japanese mass production methods are not reducible to anything like flexible specialization, as Friedman (1988) argues (Dohse, Jurgens, & Malsch, 1985; Sayer, 1988). Nor am I convinced that microelectronics is adequately handled in Flex Spec terms (e.g., Saxenian, 1991): Its mining of the Silicon Lode is based on a technological breakthrough of an historical magnitude quite beyond anything the Third Italy can boast. I'm suspicious of Storper's (1989) case for Hollywood as flexible specialization, tout court:

Television, video cassettes, and audio technologies have fundamentally conditioned the breakup of the studio system. I also find it improbable that German industry's long and continuing vitality is reducible to flexible specialization along Baden-Wurtemberg lines (Sabel, Heerigel, Kazis, & Deeg, 1987). And, finally, the big gains of the newly industrializing countries have often come in sectors such as steel, ship building and chemicals, and through modes of state planning and repression, which owe almost nothing to flexible specialization—or Fordism, for that matter (Amsden, 1989; Harris, 1986).

The preceding arguments about the new industrial revolution and its internal diversity form the basis for a more general theory of uneven development. Industrial revolutions are spatial revolutions. To their credit, Regulation and Flexible Specialization theorists have contributed to the rediscovery of the geographic in social theory and political economy in the 1980s (Soja, 1989). But each has decided shortcomings.

Abstractly, Regulation theory notes the specificities of time and place as part of its refusal of overgeneralization: Capitalism takes on varied forms as it develops throughout the world (Aglietta, 1982; Boyer, 1986a). The intention is to preserve the dialectic of the whole and the parts that is lost in world-system and globalization theories (Boyer, 1986b). Nonetheless, Regulationist thinking revolves chiefly around variants of Fordism at the level of the nation-state (Lipietz, 1987).<sup>28</sup> Advocates of Flex Spec, by contrast, have focused on the regional basis of flexible production (Becattini, 1987). This fills in an important dimension below the nation-state; but Sabel (1989) takes this much further, arguing that the regionalization of economies is supplanting national economic integration. Scott (1988b) pushes the argument in another direction, noting the formation of new industrial spaces of flexible production outside the Fordist heartlands.

I would like to pick up on the themes of localization and new industrial spaces in uneven development, while avoiding four pitfalls into which enthusiasm for flexible specialization and industrial districts can lead. First, there is no reason to think that new industrial spaces are singularly identified with Flex Spec; they have been apparent even in Fordist industries such as automobiles around Detroit. Second, the local, national and global are all important territorial levels in the rolling process of uneven development. But

the case for a strictly globalized, international division of labor under the dominion of the multinational corporations was never very strong, and the local needs to be recovered (Jenkins, 1987; Walker, 1989b).<sup>29</sup> Third, regionalism was never dead. Even within a place as homogeneous as the United States, regions such as the Midwest or California were always distinct (Page & Walker, 1991). Sabel (1989) exaggerates the contrast between past and future by using the same globalization thesis for the era of mass production as his critics. Fourth, territorial production complexes can have quite extensive external linkages, without this denying the significance of localized divisions of labor, networks, and governance mechanisms (Gordon, 1991).

The geographic theory of industrial growth and change can be developed in a way different from either the theory of Regulation or Flexible Specialization. The process of *geographical industrialization* (Storper & Walker, 1989) has the following principles:

- Key industrial breakthroughs tend to be sector- and site-specific because technological progress is strongly tied to practical competence, based on the accrual of experience and learning, and to the space for collective puzzle solving, passing on ideas, and developing the possibilities of a technological framework. Fordism's birthplace was the American Midwest for reasons that go deeper than one man's inspired madness (Hounshell, 1984; Page & Walker, 1991).
- New industrial locales have the ability to develop in unlikely places, thanks to both the rapid rates of accumulation and the experimental nature of their growth process. Industrialization produces new places, to be added to the growing and shifting geography of the developed world. The ossification of managerial and engineering practices in existing industrial areas frequently works against innovation, whereas the implementation of new industrial methods often proceeds most easily with fresh labor forces without acquired habits of work, labor organization, or self-identification.
- New industrial implantations are often sites of innovation in class and labor relations, involving new levels of exploitation, as well as new ways of working and managing. The geography of accumulation is made up of the accretion of many such local capitalisms.
- Growing industries build up extensive territorial concentrations of related activities, while at the same time spinning off growth peripheries to capture markets, conquer competitors, or exploit new supplies of labor and/or materials. Growth peripheries bring with them social practices

adhering to the new industrial base, by means of which the class relations and institutions of accumulation are substantially overhauled.

- Given the common technological and social foundations of broad industrial revolutions, the space-economy of capitalism has undergone repeated upheavals, as Marshall (1987) has shown for Britain.
- The local becomes the global as the effects of new industrial systems spread through large segments of the national and international economy and transform the larger capitalist system.

Regulation theory, by contrast, overstates the necessity of national and international consolidation of a mode of regulation (cf. Brenner & Glick, 1991). As late as the 1970s, the unions in the United States were still fighting corporate end runs to southern branch plants or through southern-controlled congressional committees in an effort to salvage a declining U.S. Fordism (Clark, 1989; Schoenberger, 1988). Similarly, the regime of Italian Fordism, centered in the north, was never successful in conquering either the center or the south (Sabel, 1982). Consolidation of any regime at the international level is even more problematic, as the interwar years show (Mistral, 1986). Today's situation is very much open, with no clear hegemonic form of production yet established (Sayer, 1988; Leborgne & Lipietz, 1990).

More important, even where a core national economy sits safely atop the world, it presides over a system of uneven development in which the parts are moving at different rhythms and speeds. Just-in-time delivery and computer-guided machines were gestating in the belly of Fordism, beginning to kick up a disturbance before erupting full-born on the world stage. This represents more than different sectoral growth rates and their disturbing influence on accumulation; it means nurturing potential new forms of employment and class relations, which serve as a political as well as economic challenge to the hegemonic order. Geography is deeply indicted in this drama of capitalist regicide, placing the crucial contradictions often just beyond our field of vision. One has to return to the place of Japan again: its growth rate has far exceeded all other developed nations, whereas its experience of crisis has been much milder (Gordon, 1988; Lipietz, 1987). A most profound struggle is now being played out as Japan—now the wealthiest nation—shoulders its way to the top.<sup>30</sup>

### The Dynamics of Accumulation and Crisis

The great postwar boom in global capitalism—whether it is called High Fordism, the Golden Age, or something else—fell on rocky times after 1970. Growth rates have generally been slower in the last 20 years than in the previous 20, business cycles more marked, unemployment and poverty more persistent (see e.g., Brenner & Glick, 1991; Devine, 1986; Marglin & Schor, 1989). What caused this economic slowdown and instability? More generally, what is the process by which any industrial epoch comes to an end, to be transcended by another?

Every period of rapid economic growth, or accumulation of capital, eventually slows as the conditions for balanced expansion disintegrate. As things come apart, the economy usually goes into some form of open crisis, such as the bankruptcy of many companies, collapse of major banks, and sudden widespread layoffs of workers. The precept that such crises are generated by the internal logic of the economy is shared by Marxist, Schumpeterian, and Keynesian theorists but rejected by neoclassicals, for whom the balancing mechanisms of the market are entirely self-regulating, absent large external shocks such as OPEC's raising of oil prices in the early 1970s. Regulation theory falls into the first camp, whereas Flex Spec is essentially neoclassical (or noncommittal) in its treatment of the end of the era of mass production.

Marxist crisis theory has had a fruitful intellectual history, but one long on disputation and short on consensus. One can understand the impatience with what has often degenerated into a scholastic debate. Regulation theory can be seen, in this light, as an effort to get round the Vs and Cs and get on with filling in the middle level of treating the contours of growth and crisis in greater richness: the "diversity of their exact forms" (Boyer, 1986b, p. 15). Yet Regulation theory explicitly acknowledges the Marxian precept that the initial wellspring of crisis, however it may be compounded by middle-level forces, lies within the accumulation process itself, not in happenstance (Boyer, 1986b, p. 69). In fact, Regulation theorists have been in the midst of a flurry of recent research into the exact course of the economy leading up to the great crises of the 1930s and 1970s, which brought the two long periods of expansion in the 20th century to an end.

There is a growing body of evidence to support the classic Marxian idea that the slowdown of accumulation is led by a falling rate of profit.<sup>31</sup> For the postwar era, it appears that profits fell rather steadily from a point circa 1950 through the 1960s and have revived somewhat (but variably) since (for reviews see Cherry et al., 1988; Devine, 1986; see especially Duménil & Levy, 1989b; Shaikh, 1987; Webber & Rigby, 1986).

The principal cause of the postwar fall in the rate of profit was, according to the Regulationists, the stagnation of Fordist production methods (Aglietta, 1979; Boyer, 1988b; Lipietz, 1986). Fordism, it is said, ran up against the technical and social limits of the basic framework (cf. Schoenberger, 1988). Increasing detail division of labor created mismatches among the cycle times of various subprocesses, dedicated machinery became too unadaptable, delays or failures in one part of the system could jeopardize the whole of articulated assembly lines, and so forth. At heart of the failure of Fordism was a porousness in the application of labor (Aglietta, 1979). Concomitantly, the intensification of labor and of mind-numbing Taylorist work rationalization generated worker absenteeism, resistance, and poor work quality.<sup>32</sup>

Some sort of exhaustion of any technological framework is to be expected at some point (Sahal, 1981; Walker, 1985b). But the evidence for a general exhaustion of mass assembly processes is poor. For example, Japanese productivity in auto assembly was rising fast throughout the last 40 years, and Japanese car makers eventually overtook U.S. and European producers in volume on a world scale (Abernathy, Clark, & Kantrow, 1983; Mair, Florida, & Kenney, 1988). The more "exhausted" portions of the industry were outcompeted and displaced to a large degree. As for technological stagnation in general, it is almost impossible to make such a case. The Regulationists are here reproducing a pure Schumpeterian theory of growth and crisis, in which waves of technical innovations trigger epochs of growth and exhaustion of those innovations lead to crisis, until a new wave of innovations bursts on the scene. This theory has been amply researched in recent years (Mensch, 1979) and rejected by the neo-Schumpeterian School itself (Freeman, Clark, & Soete, 1982).

On this much we agree: that the rate of technological change is a fundamental variable in any analysis of growth and crisis tendencies

in capitalism. But to me it is essential to locate the source of crisis in the forward movement rather than the stagnation of the forces of production. My reading of Marx's analysis of the falling rate of profit is that he was trying to make his theory of capitalist development consistent with crisis. That is, he wished to show that the principal dynamic force in capitalist expansion—the drive for relative surplus value by revolutionizing the labor process—was at the same time capable of undermining accumulation as it proceeded. Technological dynamism ought to figure in major crises in the capitalist system, then, but in what way? We shall return to this in a moment, but consider first the Regulationists' treatment of the early 20th century.

The Great Depression of the 1930s is explained by the Regulationists as a crisis due to the rapid growth of productivity combined with the rapid spread of Fordist methods, uncompensated by a parallel growth of consumption due to suppression of working-class organization after World War I (Aglietta, 1979; Boyer, 1986b, 1988b; Lipietz, 1987; see also Devine, 1983).<sup>33</sup> Here the problem is not stagnation but rather too-rapid technological change. The key failure of the system is portrayed as the lack of an appropriate mode of regulation (especially the wage accord). Thus the Regulationists have two theories of crisis for the whole century-long period of Fordist mass production: underconsumption in the 1920s and technical stagnation in the 1970s. This may be a sign of open-mindedness, or an intellectual shell game.

The underconsumptionist view of the 1920s has been sharply challenged (Brenner & Glick, 1991; Duménil, Glick, & Rangel, 1987; Duménil & Lévy, 1989b). There is no clear evidence in the aggregate statistics on U.S. consumption to show that it lagged behind production in the 1920s, even though there are indications of rising productivity from World War I onward. The fallacy in the argument is to think that a shift in aggregate income distribution away from the working class took place, and that this meant mass consumption sagged. Rather, profits fell more than wages, middle- and upper-class consumption roared ahead (much of it on credit), the consumption of investment goods by capitalist firms proceeded apace up to the crash.

Meanwhile the idea that either technical stagnation or underconsumption lay behind previous crises in accumulation is, for the case

of the United States at least, far-fetched. The Regulationist history of capitalist development in the United States turns on a decisive break from extensive accumulation to intensive accumulation around the turn of the century, thanks principally to Taylorism and Ford's assembly line. This is pure myth. U.S. development had been intensive from the late 18th and early 19th century, as the first industrial revolution spread and was enhanced by additional American innovations in everything from grain milling, saw milling, and cotton ginning to house building, machining, and integrated textile fabrication (Hounshell, 1984; Rosenberg, 1972). At the same time, mass consumption of industrial goods had been steadily expanding, thanks to the relatively well-off farm population, thorough commercialization of social relations, effective merchandising and retailing, and cheapening of products (Porter & Livesay, 1971; Tedlow, 1990; Williamson, 1951). The United States was Fordist before Fordism or, rather, thoroughly capitalist and rapidly developing on that basis before the 20th century (Page & Walker, 1991).

In fact, the aggregate data on technical progress (productivity growth) and mass consumption (retail sales) for the United States mark out a surprisingly smooth curve of steady exponential growth (Duménil & Lévy, 1990). Even though I am inclined to divide industrial history over the last 200 years into four epochs, or long waves, with a fifth in the offing, there is no clean break in the technical or aggregate income records at such points as 1787 or 1900.<sup>34</sup> Only with hindsight is it possible to reconstruct the kinds of substantial technical innovations that allow this amazing rate of growth to be sustained again and again, and to see that the industrial system did move through a sequential of epoch-making changes from one set of structures to another (cf. Rosenberg, 1972; Sahal, 1981; Schumpeter, 1939).

The principal flaw in Schumpeterian theories of technological exhaustion is to ignore the dynamics of investment (Harvey, 1982). If one is to take Marx and Keynes seriously, as the Regulationists purport to do, then investment has to be allowed to play a leading role in accumulation (Walker, 1988a). Investment is the critical element in the addition of new capacity, the application of new equipment, the opening up of new product lines, the creation of new firms, and so forth. It is easy to generate models of growth swings

(expansion followed by crisis of overinvestment) with a few simple assumptions, for example:

- Capitalists invest in an effort to expand their market share.
- Demand is growing at a given rate and can be saturated.
- The future cannot be anticipated perfectly.
- Competition drives every capitalist to try to expand at the expense of the others.
- Fixed capital (in equipment, structures, etc.) is necessary to production; it has a long life (e.g., 10 years) and cannot be adjusted downward instantaneously (without loss).
- Capitalists expand investment when profits rise and cut back on investment when profits fall.

In such a model, investment accelerates until supply outruns demand due to overinvestment in fixed capital, precipitating a falling rate of profit on now-underused capacity; this triggers a downward spiral of investment (and unemployment) until excess fixed capital is retired (for a review, see Van Duijn, 1983). If we allow the additional assumptions that investment can occur in new firms and through credit formation, then overinvestment will show up in these forms, as well: too many firms (excess competition) and too much debt (excess fictitious capital). Marx calls such overinvestment overaccumulation (Harvey, 1982).<sup>35</sup>

Technical change must be figured into such a model. Investment and technology are the two blades of the scissors of industrial growth, representing the demand and supply for new productive capacity. First, new technologies may be embodied in new products, which increase the rate of growth of demand (that is only possible because they also add new workers and incomes into the system to help absorb the additional output). Second, other new technologies will be embodied in more productive fixed capital, raising the rate of exploitation and hence the rate of profit.<sup>36</sup> Thus the tendencies to overproduction and falling profits in the first model will be delayed by the beneficial effects of technical change. Investment unleashes technical change (although not in direct proportion), and hence new investment can contravene the tendency to overinvestment for a period of time.<sup>37</sup>

Nonetheless, overaccumulation of capital will occur, regardless of the rate of technical change. That is, overinvestment can show up even where the forces of production are not stagnating. This has been visibly the case, for instance, in the extreme swings (of about 5 years duration) in the electronics sector over its brief history (Sturgeon & Walker, 1991). For the whole U.S. economy in the post-1965 period, this kind of overaccumulation shows up principally as a fall in the rate of profit despite a steady (if unspectacular) rise in the rate of labor and total factor productivity (Brenner & Glick, 1991). The same kind of long-term falling rate of profit is apparent in the 1880s and 1910s-1920s, as well, inscribed in the downside of the last two long waves of accumulation (Duménil & Lévy, 1989b; see also Mandel, 1975).<sup>38</sup> Concomitantly, overaccumulation showed up in all these downturns as excess competition (too many new firms offering substitute products) and excess debt (too many banks making unrecoverable loans).<sup>39</sup>

The other missing component of the stagnationist model is uneven development. It is common in crisis theory to consider intersectoral imbalances between capital goods and wage goods, using two-sector models (Harris, 1985). Aglietta (1979) and Lipietz (1986) use this sort of model. The consumer goods sector is chasing final demand but creates a secondary demand for capital goods. If both sectors are subject to the effects of business swings, then the capital goods sector will be whipsawed more sharply than consumer goods, and the whole economy will be less stable as a result.

Real economies are more complex, of course: they demonstrate persistent unevenness in rates of growth and accumulation among many different industrial sectors (Walker, 1988a).<sup>40</sup> This rests, in turn, largely on differences in rates of technical change—also on different rates of exploitation and growth in demand. In other words, as technology evolves, new sectors open up with rapid growth rates, some older sectors gain a new lease on life, and other sectors decline; in short, some sectors are always stagnating relative to others, but there is no general tendency to stagnation. There is only a process of uneven development.

Moreover, uneven development applies to the places in which differentially expanding sectors grow up, as we have previously argued. It is geographical-industrial uneven development. And it

need not be confined to individual industries but can embrace groups of related industries and territorial aggregations, such as whole nation-states.

Uneven development has several pertinent effects for the model of investment and overinvestment, growth, and accumulation crisis. First, it worsens the tendency to overinvestment, because new sectors and places competing with established ones will be eager to expand as fast as possible, and all sorts of regional and national interests kick in to promote this. Korean state planners were by no means simply responding to net global demand growth or capital markets in pursuing their policy of hothouse industrialization (Amsden, 1989). Second, it puts an added edge on overcompetition, given the uneven distribution of competencies: Those most feeling the bite of competition are laggards in the duel to improve technology. Hence the truly appalling spiral of decline in the U.S. steel industry in the 1980s, for example. Moreover new competitors usually combine innovative products or production methods with cheaper, less militant labor, in a truly deadly package, as did the capitalists of Japan, Los Angeles, and Korea (Storper & Walker, 1989).<sup>41</sup>

Third, multiple sectors growing at different rates makes for a very complex pattern of interrelated business cycles, in which the leading sectors struggle to keep the aggregate economy afloat, while laggard sectors drag it down—and the whole is pulled this way and that. Silicon Valley was out of synch with the rest of the U.S. economy throughout the last decade, for instance. Finally, uneven development worsens problems of overaccumulation in declining sectors and places, or what Harvey (1985) calls the problem of “switching” capital from areas of relative stagnation to fast-growing sectors and places. Hence the massive plant closures (and unemployment) that swept the northeastern United States in the early 1980s.

The inclusion of overinvestment and uneven development solves three outstanding difficulties besetting the simple industrial revolution model of capitalist history, as presented earlier:

- Industrial development (technical change) is more or less continuous, particularly in the sense in which innovations are actually implemented through investment in new activities and equipment. It does not require any “wave of innovation” to propel accumulation, only waves of investment.

- Industrial epochs, or regimes of accumulation, rise and fall on the basis of long waves of investment, in tandem with unfolding technologies. Accumulation crisis will come about despite continual innovation—although it will, of course, come quicker if there is significant stagnation across many sectors.<sup>42</sup>
- The seeds of the new era are already planted in the old (an old Marxist principle that appears to have been forgotten by the Regulation School). This jibes with the evidence that long before the crisis of Fordism set in, many of the important innovations of the present epoch, such as microelectronics and just-in-time assembly, had already put in their appearance.<sup>43</sup> (This is even more clearly the case if the long wave is dated from circa 1940 through the mid-1980s, not the early 1970s, as is often done) (cf. Gordon, 1988).

In addition, uneven development makes it clear that accumulation crisis can be global at the same time as it hits different countries and regions differentially. Japan can be rising in the 1970s and 1980s even as the global economy suffers through relatively poor growth and greater instability; indeed, Japan's meteoric rise is part and parcel of the overcompetition, overinvestment, and instability problems besetting the system. The same could be said of a leading sector, such as microelectronics.

The above model of overaccumulation and uneven development contains all the essentials of growth and crisis in the postwar era. The question for the Regulation School at this point is: what does the theory of Regulation add to this classical explanation? Lipietz (1986, p. 27) ends his careful treatment of the falling rate of profit with a disclaimer against “a Talmudic harking back to a general Marxian theory of crisis,” but this is pure window dressing. The fact remains that the mode of regulation does not add a jot to the explanatory power of his model.<sup>44</sup> To be sure, there is a breakdown of the four main sites of balanced growth or points of regulation: competitive undermining of oligopolies by new firms, competitive undermining of high wage rates/unionization by new labor forces, undermining of the hegemony of U.S. capital by international competition, and the bloating of the credit-system to finance such investments.<sup>45</sup> But these are all easily comprehended as elaborations of the basic model, not as something apart; and the important point is that the grinding of economic gears is still what shatters the carefully built-up institutional apparatus of regulation.<sup>46</sup>

In short, the Regulationist argument rests too much on the coherence and stability of regimes of accumulation and not enough on the essential role of contradiction and unevenness in the dynamics of capitalist development. It is fundamentally derived from the French traditions of organic theories of society, in the manner of Durkheim, and structuralism, in the manner of Levy-Strauss and Althusser (e.g., Aglietta & Brender, 1984; Lipietz, 1988).<sup>47</sup> As such, it contrasts with the vision of Marx and Schumpeter as to the tumult of modernism, marked by "creative destruction" and the way "all that is solid melts into air" (Faucher & DeBresson, 1990; Harvey, 1989).

The Flexible Specialization School is largely bereft of any explanatory theory of crisis by which the Golden Age of postwar mass production was undone. The key term in Piore and Sabel's (1984) account is *the breakup of mass markets* (see also, e.g., Scott & Storper, 1990). This breakup means that rigid Fordist production methods cannot respond as effectively as flexible production systems. They sometimes seem to attribute the breakup of mass consumption to changing tastes, but fashion can only be a minor contributor to the problem. A more plausible reason for the breakup of markets is the end of the postwar labor accord, with corresponding loss of disposable income among the middle ranks of the working class (this is simply the breakdown of the mode of regulation by another name (cf. Pollert, 1988). Certainly, redistribution could have had effects on the composition of demand, with a diminishing portion of mass-produced items suitable for the working class. But the upward redistribution that occurred in the 1970s and 1980s came after the crisis of profitability had already set in (Brenner & Glick, 1991). It was the crisis in accumulation that led capitalists to attack the working class's share of national income, helping precipitate a falling wage rate and breakdown of the labor accord in the 1970s and 1980s (Harrison & Bluestone, 1988).<sup>48</sup> In other words, the crisis of Keynesianism is an effect as much as a cause of the end of the postwar boom (Lipietz, 1986).<sup>49</sup>

Most plausibly, the breakup of mass markets can be attributed to excessive competition, as many writers put it. Growing competition—seen especially as international competition in the United States and Britain—is by far the most important cause of the breakup (Feldman, 1989). But overcompetition is due to overaccumulation.

Attributing increased competition to internationalization of markets, as Schoenberger (1988) does, only evades the connection between competition and accumulation; internationalization is due to the growth of effective competitors abroad—that is, worldwide capital accumulation—as well as more effective foreign competitors—that is, technological progress in an unevenly developing world. (As for competition from U.S. or European branch plants, they are also the result of investment of accumulated profits in the core looking for new outlets.)

Here, too, the timing of the crisis is closely related to uneven development in a way that Flex Spec theory cannot comprehend, given its "totalizing discourse" of mass production versus flexible specialization.<sup>50</sup> The Flex Spec camp sees flexibility as almost entirely a response to the crisis of the last 20 years, rather than as a development nurtured within the bosom of Fordism.<sup>51</sup>

## CONCLUSION

The failure of Regulation theory and Flex Spec theory to explain growth and accumulation crisis are not surprising in light of the lack of true dynamics in their models of Fordism and flexibility. They lack the dynamism of both investment/accumulation and of technical change/advancing forces of production, as well as the unexpected turmoil induced by uneven development. In fact, the inability of these schools of thought to see the further evolution of the labor process across a wide swath of industrial activities is the principal cause of the strategic shifts they make in historical explanation. In the case of Regulation theory, Fordism bursts forth in the 20th century, creates fundamental problems of stabilization, and ultimately stagnates. In response to this simplistic account, the causal weight of the model is transferred to the institutional superstructure, or mode of regulation, and the result can hardly be called dynamic or historical at all. In the case of Flex Spec, demand shifts take us across the industrial divide from craft to mass production and back again (regardless of whether their origin is tastes, distribution, or state support). History circles back on itself, or shifts to and fro aimlessly, rather than moving forward with industrialization and capitalist development.



In contrast to the two prevailing schools, I have argued for a more dynamic, historical view of the past and the present, in which the evolving forces of production, driven by the classic laws of the capitalist mode of production, play a critically important role in economic development and in changes in the capitalist system over time and space. Those forces are necessary (if not sufficient) to any satisfactory understanding of growth, crisis, the character of production regimes, and uneven development. In so arguing, I am bucking much of the tradition on the Left, which woefully neglects the technological basis of development and modern life, as well as the current fashion to deny large historical structures and forces such as capitalist property relations. I am not opting for modernization theory or industrial society as the basic category of analysis. Yet I am aware that Marxists and their challengers often have a hard time answering the gut appeal of the theory of modernization because it refers in such large part directly to the experience of the productive (and disruptive) powers of industrialization (e.g., Berman, 1982). To recover the full significance of the term *labor*—the interaction with nature and the physical foundations of social life (Smith, 1984)—without losing sight of the powers of capital—that curious form of modern property—is simply to live up to the spirit of historical-geographical materialism.

Let me be clear that by this I do not mean that the relations of production follow along passively, adapting to the developing forces of production, as in the historical materialism of Cohen (1979). What I mean is that the shifting foundation of production—the amazing process of industrialization—has repeatedly knocked the props out from under established social arrangements and posed new puzzles for humanity to solve. How this unwinds is very much an open, experimental process, even though the contours of the prevailing social relations of production channel the movement in certain ways. The dialectic of forces and relations is an ongoing negotiation within a predominantly capitalist order, which, at this juncture, is not likely to give way to some kind of socialism through a millenarian rupture. None of this can be taken to diminish the role of politics and social struggle, unless it is unacceptable to make politics anything less than everything. Rather, it is to argue that the forces of production people develop and employ some basic terms for the world they live in, mold to their ends, and cry over.

## NOTES

1. It is amazing to me that Regulation and Flexible Specialization theories have gained so much attention in the 1980s, while the ambitious synthesis of Marx and Schumpeter by Mandel (1975) is nearly forgotten. For all his flaws, Mandel attempted a coherent treatment of technology, accumulation, class relations, and historical epochs. For a useful comparison of the three models, see Webber (1990).

2. I shall try to differentiate clearly between Regulation theory and Flexible Specialization, even though there has lately been a great deal of cross-fertilization between the two (e.g., Leborgne & Lipietz, 1990; Scott & Storper, 1990).

3. The main advocates of Regulation theory are Aglietta (1976, 1979, 1982), Lipietz (1982, 1987), Boyer (1986b), Coriat (1979) and Mistral (Boyer & Mistral, 1978).

4. Owing much to the Annales School of history, American institutionalist economists, and Althusser's revolt against Stalinist orthodoxy in French communist thought. These methodological precepts resonate with ideas on the Anglo-American left, such as the English philosophical movement called Realism (and to a lesser extent Structuration theory) in the attempt to deal with open and complex systems in a nonreductionist way while still having recourse to the explanatory power of underlying structure and mechanisms (Sayer, 1984).

5. Early efforts, principally by Piore and Sabel (1984) and Becattini (1987), to put a shining face on flexible specialization by underplaying the exploitation of labor and overplaying the craft control of the process have generally been abandoned in the face of withering criticism (e.g., Boyer, 1988a; Pollert, 1988). But the more circumspect adherents never saw new methods of production as more than contingently connected to conditions of employment (e.g., Christopherson & Storper, 1988; Scott, 1988a).

6. Fordism sometimes refers to a production system, sometimes to the idea of paying high wages to absorb mass output. However, the story about Henry Ford paying \$5 per day to sell his cars—that was picked up by Gramsci and through him Aglietta—is purely apocryphal: Henry did it to retain workers when his turnover rate on the new assembly line hit 200% per year.

7. More broadly, Regulation theory is a two-stage history of capitalism, with the 19th century seen as extensive growth of production, lack of mass market and competitive regulation and the 20th century as intensive production, mass consumption, and monopoly-state regulation. However, its treatment of the 19th century is quite weak (see below). My only difference with the critique by Brenner and Glick is that they slight industrial development before 1860.

8. What is more, the periods are most unlikely to be the same in the United States and Europe, as is usually implied (this after all the to-do about respecting the specificities of time and place!). Schumpeter (1939), by contrast, is very careful about the frequent nonconvergence of business cycles in different countries.

9. I can hardly agree with Leborgne and Lipietz (1990), therefore, that Flex Spec is a form of technical determinism. Technology hardly enters the picture at all. The whole problem with both schools is the almost complete indeterminacy of their models, in which history stops dead in its tracks.

10. A term that slights agriculture and urbanization if not used with care (Page & Walker, 1991).

11. This does not mean I am fully in accord with all the contemporary versions of long wave history (e.g., Berry, 1991; Bowles, Gordon, & Weisskopf, 1983; Hall & Preston,

1988). Schumpeter also provides an account for economic, technical, and institutional changes at the level of short swings, which virtually all other accounts ignore.

12. This is not to say that a fully satisfactory economic theory of technical change exists, and some kind of combination of evolutionary economics (e.g., Nelson & Winter, 1982) and Marxism seems to be the best we have (Storper & Walker, 1989; Webber, Sheppard, & Rigby, 1990).

13. Accumulation and class struggle are not the only things propelling industrialization; human ingenuity and natural systems have logics, as well (Mowery & Rosenberg, 1976; Sahal, 1981).

14. Labor valuation runs up against the heterogeneity of skills (quality of labor) and wages (costs of reproduction), a problem solved, I believe, by Itoh (1987). Capital valuation runs up against the problem that the price of capital goods implicitly includes their future income streams, assessed at the current interest rate (Harcourt, 1972). However, the question of measurement can quickly take us into the morass of value theory and capital theory, into which we shall not plunge in this chapter (see Walker, 1988a).

15. On the limits of a demand-led theory of technical change, see Mowery and Rosenberg (1976).

16. The central ideas of the Flex Spec thesis are three. First, capitalist firms are learning to respond more flexibly to more fragmented and unstable demands as mass markets break down, by producing a wider and more variable set of commodities and innovating new products more quickly. Second, they accomplish this end by means of more creative use of skilled labor, by more flexible relations among firms, and with the aid of new programmable machines. Third, this approach develops most forcefully where production becomes more flexibly organized; this occurs chiefly in vertically disintegrated networks of firms and the industrial districts in which they tend to cluster, but not without the help of regional systems of cooperation and governance and imitation by large firms and their subcontractor networks.

17. Also, firms are not all crowding into specialty niche markets using flexible methods for product diversification. Rather product expansion (not just diversification) has always been a basic strategy for expanding the realm of accumulation (although too much neglected in Marxist analysis in favor of cost reductions). This does not imply a new attention to flexibility so much as an increased awareness of the possibilities for sales inherent in opening up new fields of demand. The same is true of improvements in preproduction design, simulation, and market-testing phases of production: This systematizes the generation of new products and assures better realization of their value. But it is no more a matter of flexibility than the armies of sales workers developed throughout the last century.

18. In short, Regulation theory attributes to the Fordist epoch alone what has been a long-standing pattern of industrial capitalism, which Marx attributed to capitalist property relations (Brenner & Glick, 1991).

19. Taylorist and Fordist actually apply to rather different batch and mass production systems (Coombs & Jones, 1989).

20. Indeed it can be argued that the Regulation School really has no theory of technical change at all (Faucher & DeBresson, 1990; cf. Boyer, 1988b). This is partly due to the strategic shift in its model from production to consumption as the driving force of capitalist development—a very Keynesian move that leaves them surprisingly close, in the end, to the Flex Spec School.

21. This sketch is based on Walker, 1985b and 1993.

22. Technical change does not consist only in making the same things more cheaply, but also in meeting new needs—a point that Marx neglected (Morgan & Sayer, 1988; Schumpeter, 1934). With capital goods, better products improve productivity and performance in other sectors (Rosenberg, 1976).

23. These have been gleaned from a wide literature, from which a selection follows: Adler, 1985; Aoki, 1990; Cohendet, 1988; DeBresson & Walker, 1991; Dosi, Freeman, Nelson, Silverberg, & Soete, 1988; Florida, 1991; Forester, 1987, 1989; Freeman, 1987, 1991; Gardner & Sheppard, 1989; Hakansson, 1989; Hoffman & Kaplinsky, 1988; Kenney and Florida, 1988; Lazonick, 1990; Martinez and Jaramillo, 1989; Monden, 1983; Morris-Suzuki, 1988; Perez, 1985; Sayer, 1986; Scott, 1988b; Storper, 1989; Williams et al., 1987; Wood, 1989; Zuboff, 1988.

24. But see Storper and Scott (1992) for a sense of the expanding definition of industrial change now admitted into the broad compass of the Regulation School and flexible production theory.

25. On this point I agree with Coombs and Jones (1989), but see far more than the three paradigms they indicate (neo-Taylorism, neo-Fordism, post-Fordism). Their discussion, like so many, is also based entirely on the mechanical industries.

26. Or what Morris-Suzuki (1988) calls "perpetual innovation."

27. Kenney and Florida (1988) link the just-in-time to continuous innovation in defining a total Japanese production package that they see as far ahead of all competitors (see also Florida, 1991; Florida & Kenney, 1990).

28. See also the valuable amendments by Schoenberger (1988) on Fordism and Mistral (1986) on regulation at the international level.

29. To respond to Flex Spec, as if it were an obvious heresy from a known truth, by wheeling out the weary catechisms of globalization will not do (e.g., Amin, 1989).

30. Japan has been sorely misunderstood. It is distinctive both for its particular production achievements in automobiles, consumer electronics, shipbuilding, steel, and so on and for its force as a national economy. Gordon's (1988, p. 60) statement that, "The Japanese story is, by and large, one of corporatist collaboration between large corporations and the state," slights the productive base. At the latter level, arguments about whether Japanese production methods are neo-Fordist or flexible specialization are beside the point, since the national economy of Japan has a coherence that matters decisively in the struggle for hegemony. It is rather disingenuous, in light of Japan's weight in the world economy, for Sabel (1989) to argue that the new production regime is diffusing from Italy to Japan. Then, too, Anderson's (1987) comment that Japan is "the last great classically national economy" seems to me way off the mark; it is, rather, more a sign of British malaise to think that world hegemony is old hat.

31. Although aggregate figures on rates of profit do not quickly or simply translate into enterprise rates of profit to which capitalists respond directly (Walker, 1988a).

32. A similar and quite convincing list of shortcomings of Fordist production methods has been developed by many writers on the Anglo-American Left (see, e.g., Florida & Kenney, 1990; Knights, Wilmott, & Colinson, 1985; Littler, 1982; Wood, 1989).

33. And the valuable debate between Duménil et al. (1987) and Devine (in press). The Regulationists' views on this matter are almost completely a rehash of the Keynesian Alvin Hansen and the Marxian-Keynesian Paul Sweezy (1942), writing in the 1940s. Brenner and Glick (1991) discuss the underconsumptionist aspect of Regulation theory at great length, whereas I prefer to emphasize the problems in their treatment of production.

34. However, there is a remarkable and as yet unexplained rise in the productivity of capital in World War II (Duménil & Lévy, 1989a). This may mark an industrial

revolution spurred on by the war, which is completely absent in the history told by the Regulationists; but it is as yet unexplained.

35. Such a model generates disequilibrium owing to differential rates of change between demand and supply, behind which lie imbalances in fixed and circulating capital, that is, fixed capital cannot be adjusted quickly enough to avoid overinvestment and overproduction. One cannot simply invoke long-term adjustment to overcome such short-term imbalances; in neoclassical fashion, the process of adjustment is sufficiently imperfect that it generates patterns of instability (oscillations) in growth. It does not, except rarely, produce the kind of radical short-term rupture and stagnation depicted in Keynesian theory (Duménil & Lévy, 1989b, 1990).

36. It is a good idea to include compensating reductions in constant capital due to cheapening of capital goods, more efficient use of materials, and additions of labor-intensive activities owing to a widening division of labor and product innovation.

37. I beg the question here of the existence of swings and industrial epochs of varying lengths and overlapping occurrence.

38. The role of the productivity of capital (i.e., nonlabor inputs) in the postwar falling rate of profit is very much in doubt. U.S. total factor productivity appears to have wavered with shorter business cycles in the 1950s to 1970s, without any clear long-term decline (Brenner, 1991). At the same time, Duménil and Lévy (1989a) show a falling productivity of capital throughout the 20th century, except for the rise during World War II. This sort of long, long-term fall in the productivity of capital does not alter the model of long waves or shorter business cycles based on investment outrunning productivity to produce a falling rate of profit. (If there were a real break in capital productivity during the war, it would only help explain the extraordinary vigor of the postwar expansion period.)

39. Although I am not discussing the Social Structure of Accumulation School in this chapter, a couple of words are in order about their theory of crisis, which is driven principally by rising worker militancy and wages (Bowles et al., 1983). Although the latter may have worsened the rate of profit in the mid-1960s, there is no evidence that wages outran accumulation for the preceding period and considerable evidence that wages have fallen in the 1970s and 1980s without yet putting accumulation back on its feet (Brenner & Glick, 1991). In the model of overaccumulation, worsening income distribution would not shrink aggregate demand but rather shift its composition. In particular, capitalist class profits and savings would be higher, leading to a more rapid rate of investment (and credit creation, as the savings flow through banks into new investment), which would worsen the process of overaccumulation. This would have been particularly apparent in the United States during the 1920s when this country was the leading area of capitalist expansion; today much of the new investment is shifted elsewhere.

40. I do not agree with Glick's portrait of profit equalization (Brenner & Glick, 1991; Glick & Ehrbar, 1990). I don't think that high capital mobility is incompatible with permanent disequilibrium growth, nor that such an assumption is necessary, either for crisis theory or the critique of monopoly theory.

41. Competition is not just a matter of spatial diffusion of Fordist technology to peripheral areas generating low-wage competition for the core (cf. Gramsci, 1971, p. 311). Fordism had long been expanding globally into lower-wage areas (Europe and Japan), where it helped raise wages and sustain the long postwar boom (Schoenberger, 1988); why did this end? Why did low-wage competitors in Asia who were once laughed at for their shoddy goods ultimately become threats to American and European capital?

42. In other words, the model does not ride on the outcome of the debate over stagnating Fordist methods in key sectors such as automobiles, in key places such as the United States and France; it works in any case. Mandel (1975) was correct to embed technological revolutions in a matrix of long waves of investment and business activity but still clung too closely to Schumpeter's idea of clusters of innovations.

43. Just as the new Fordist methods (among other things) were being installed rapidly in the 1920s. On the unevenness of sectoral development at that time (defined somewhat differently) and its import for crisis theory, see Devine (in press).

44. Note the way Bertrand (1986), in discussing postwar growth in France in a much more institutionalist manner, skips around the issue of why the mode of regulation broke down. The explanatory failure of regulation theory for the crisis of the 1920s and 1930s is even worse, of course. According to the theory, there is no effective mode of regulation at the time—so how then is any balance achieved at all?

45. Regulation theorists have made a concerted exploration of financial matters and state intervention, which I skip by here at some risk (see, e.g., Aglietta, 1979; Lipietz, 1979, 1983).

46. For an excellent explication of the various explicit or implicit economic models of crisis adhered to by Aglietta, Lipietz, Boyer, and Bertrand, see Duménil and Lévy (1990).

47. See also the critique by Peet (1989) and Faucher and DeBresson (1990).

48. The sequence of events is this: Profits fell all through the long postwar upswing (by some accounts) or by 1966 (by others), but the edifice was not seriously breached until 1970-1975. The wage accord then began to come apart, with hyperinflation in the 1970s and deflation in the early 1980s. This may have allowed the rate of profit to rise from perhaps the mid-1970s and certainly in the 1980s, even though capitalists continued to be beset by volatile conditions and intensified competition.

49. One can add the state into this account, as the Flex Spec School usually does; its theorists have a strong interest in state regulation of production and consumption, which I do not treat here (Piore & Sabel, 1984; Sabel, 1989; Scott & Storper, 1990). But the same caveats hold about the timing of the right-wing attack on government and the end of the welfare state, which occurs almost entirely after 1978 (Harrison & Bluestone, 1988).

50. I use the bracketed term ironically in response to Flex Spec advocate Michael Storper's (1987) wrongheaded postmodernist critique of Marxism.

51. As an aside, Flex Spec theorists have very little to say about money and finance. This is, I surmise, related to their greater distance from the theory of value and capital that animates the Regulation School via Marxism.

## REFERENCES

- Abernathy, W., Clark, D., & Kantrow, E. (1983). *Industrial renaissance: Producing a competitive future for America*. New York: Basic Books.
- Adler, P. (1985). Technology and us. *Socialist Review*, 85, 67-98.
- Aglietta, M. (1976). *Régulation et crises du capitalisme*. Paris: Calmann-Lévy.
- Aglietta, M. (1979). *A theory of capitalist regulation*. London: New Left Books. (Original work published 1974)

- Aglietta, M. (1982). World capitalism in the eighties. *New Left Review*, 136, 3-41.
- Aglietta, M., & Brender, A. (1984). *Les metamorphoses de la societe salariale: la France en projet*. Paris: Calmann-Lévy.
- Amin, A. (1989). Flexible specialisation and small firms in Italy: Myths and realities. *Antipode*, 21(1), 13-34.
- Amsden, A. (1989) *Asia's next giant: South Korea and late industrialization*. New York: Cambridge University Press.
- Anderson, P. (1987). The figures of descent. *New Left Review*, 161, 20-77.
- Aoki, M. (1990). A new paradigm of work organization and coordination? Lessons from the Japanese experience. In S. Marglin & J. Schor (Eds.), *The golden age of capitalism: Reinterpreting the postwar experience* (pp. 267-293). New York: Oxford University Press.
- Baran, P., & Sweezy, P. (1966). *Monopoly capital*. New York: Monthly Review Press.
- Becattini, G. (Ed.). (1987). *Mercato e forze locali: Il distretto industriale*. Bologna: Il Mulino.
- Berman, M. (1982). *All that is solid melts into air*. New York: Simon & Schuster.
- Berry, B. (1991). *Long-wave rhythms in economic development and political behavior*. Baltimore, MD: The Johns Hopkins University Press.
- Bertrand, H. (1986). France: modernisations et piétinements. In R. Boyer (Ed.), *Capitalismes fin de Siècle* (pp. 67-105). Paris: Presses Universitaires de France.
- Bowles, S., Gordon, D., & Weisskopf, T. (1983). *Beyond the waste land: A democratic alternative to economic decline*. Garden City, NY: Anchor.
- Boyer, R. (Ed.). (1986a). *Capitalismes fin de siècle*. Paris: Presses Universitaires de France.
- Boyer, R. (1986b). *La théorie de la régulation: Une analyse critique*. Paris: Éditions La Découverte.
- Boyer, R. (Ed.). (1988a). *The search for labor market flexibility*. Oxford, UK: Clarendon.
- Boyer, R. (1988b). Technical change and the theory of regulation. In G. Dosi, C. Freeman, R. Nelson, G. Silverberg, & L. Soete (Eds.), *Technical change and economic theory* (pp. 67-94). New York: Pinter.
- Boyer, R., & Mistral, J. (1978). *Accumulation, inflation, crises*. Paris: Presses Universitaires de France.
- Braverman, H. (1974). *Labor and monopoly capital*. New York: Monthly Review Press.
- Brenner, R. (1977). The origins of capitalist development: A critique of neo-Smithian Marxism. *New Left Review*, 104, 25-92.
- Brenner, R. (1991). *International crisis and U.S. decline*. Unpublished manuscript, Center for Social Theory and Comparative History, University of California, Los Angeles.
- Brenner, R., & Glick, M. (1991). The regulation approach: Theory and history. *New Left Review*, 188, 45-120.
- Brusco, S., & Sabel, C. (1983). Artisanal production and economic growth. In F. Wilkinson (Ed.), *The dynamics of labor market segmentation* (pp. 99-113). London: Academic Press.
- Chandler, A. (1977). *The visible hand*. Cambridge, MA: Harvard University Press.
- Cherry, R., D'Onofrio, C., Kurdas, C., Michl, T., Moseley, F., & Naples, M. (Eds.). (1988). *The imperiled economy* (2 vols.) New York: Union for Radical Political Economics.
- Christopherson, S. (1988). Overworked and underemployed: The redistribution of work in the U.S. economy. Unpublished manuscript, Department of City and Regional Planning, Cornell University, Ithaca, NY.

- Christopherson, S., & Storper, M. (1988). New forms of labor segmentation and production politics in flexibly specialized industries. *Industrial and Labor Relations Review*, 42(3), 331-347.
- Clark, G. (1989). *Unions and communities under siege: American communities and the crisis of organized labor*. Cambridge, UK: Cambridge University Press.
- Cohen, G. (1979). *Karl Marx's theory of history: A defence*. Princeton, NJ: Princeton University Press.
- Cohendet, P. (1988). *New advanced materials: Economic dynamics and European strategy*. Berlin/New York: Springer-Verlag.
- Coombs, R., & Jones, B. (1989). Alternative successors to Fordism. In H. Ernste & C. Jaeger (Eds.), *Information society and spatial structure* (pp. 107-116). New York: Belhaven Press.
- Coriat, B. (1979). *L'atelier et le chronometre*. Paris: Christian Bourgois.
- Coriat, B. (1983). *La robotique*. Paris: La Decouverte/Maspero.
- Cusumano, M. (1985). *The Japanese automobile industry*. Cambridge, MA: Harvard University Press.
- DeBresson, C., & Walker, R. (Eds.). (1991). Networks of innovators [Special Issue]. *Research Policy*, 20(5), 363-512.
- Devine, J. (1983). Underconsumption, overinvestment and the origins of the great depression. *Review of Radical Political Economy*, 15(2), 1-28.
- Devine, J. (Ed.). (1986). Empirical work in Marxian crisis theory [Special Issue]. *Review of Radical Political Economics*, 18(1&2), 1-260.
- Devine, J. (in press). Falling profit rates and the causes of the 1929-33 collapse: Toward a synthesis. *Research in Radical Political Economy*.
- Dohse, K., Jurgens, U., & Malsch, T. (1985). From Fordism to Toyotism? The social organisation of the labour process in the Japanese automobile industry. *Politics and Society*, 14(2), 115-146.
- Donaghu, M., & Barff, R. (1991). Nike just did it: International subcontracting and flexibility in athletic footwear production. *Regional Studies*, 24, 537-552.
- Dosi, G., Freeman, C., Nelson, R., Silverberg, G., & Soete, L. (Eds.). (1988). *Technical change and economic theory*. New York: Pinter.
- Duménil, G., Glick, M., & Rangel, J. (1987). Theories of the great depression: Why did profitability matter? *Review of Radical Political Economics*, 19(2), 16-42.
- Duménil, G., & Lévy, D. (1989a). Micro adjustment behavior and macro stability. *Seoul Journal of Economics*, 2(1), 1-37.
- Duménil, G., & Lévy, D. (1989b). *The regulation school in light of one century of the U.S. economy* (Working Paper). Paris: CREPREMAP.
- Duménil, G., & Lévy, D. (1990). *Les régulationnistes pouvaient-ils apprendre d'avantage des classiques?* (Working Paper). Paris: CEPREMAP.
- Faucher, P., & DeBresson, C. (1990). *L'école de la régulation on technological change*. Unpublished manuscript, CREDIT, Université de Québec à Montréal.
- Feldman, M. (1989). *The flexibility thesis and vertical disintegration*. (Working Paper BV89-2, University of Rhode Island Graduate Program in Community Planning and Area Development).
- Fitzsimmons, M. (1986). The new industrial agriculture: The regional integration of specialty crop production. *Economic Geography*, 62(4), 334-353.
- Florida, R. (1991). *The new industrial revolution*. (Working Paper No. 91-07, Carnegie Mellon University, School of Urban and Public Affairs).
- Florida, R., & Kenney, M. (1990). *The breakthrough economy*. New York: Basic Books.

- Forester, T. (Ed.). (1987). *The information technology revolution*. Cambridge, MA: MIT Press.
- Forester, T. (Ed.). (1989). *The materials revolution*. Cambridge: MIT Press.
- Forty, A. (1986). *Objects of desire: Design and society, 1750-1980*. London: Thames and Hudson/Cameron.
- Fraser, S., & Gerstle, G. (Eds.). (1989). *The rise and fall of the New Deal order*. Princeton, NJ: Princeton University Press.
- Freeman, C. (1982). *The economics of industrial innovation* (2nd ed.). London: Frances Pinter.
- Freeman, C. (1987). *Technology policy and economic performance: Lessons from Japan*. London: Frances Pinter.
- Freeman, C. (1991). Networks of innovators: A synthesis of research issues. *Research Policy*, 20(5), 499-514.
- Freeman, C., Clark, J., & Soete, L. (1982). *Unemployment and technical innovation*. Westport, CT: Greenwood Press.
- Friedman, D. (1988). *The misunderstood miracle: Politics and economic decentralization in Japan*. Ithaca, NY: Cornell University Press.
- Gardner, C., & Sheppard, J. (1989). *Consuming passion: The rise of retail culture*. London: Unwin Hyman.
- Gertler, M. (1988). The limits to flexibility: Comments on the post-Fordist vision of production and its geography. *Transactions of the Institute of British Geographers*, 13(4), 19-32.
- Glick, M., & Ehrbar, H. (1990). Long-run equilibrium in the empirical study of monopoly and competition. *Economic Inquiry*, 28, 151-162.
- Gordon, D. (1988). The global economy: New edifice or crumbling foundation? *New Left Review*, 168, 24-65.
- Gordon, R. (1991). Innovation, industrial networks, and high technology regions. In R. Camagni (Ed.), *Innovation networks: Spatial perspectives* (pp. 174-195). London: Belhaven.
- Gramsci, A. (1971). *Prison notebooks*. New York: International.
- Hakansson, H. (1989). *Corporate technological behavior: Cooperation and networks*. London: Routledge.
- Hall, P., & Preston, P. (1988). *The carrier wave: New information technology and the geography of innovation, 1846-2003*. Boston: Unwin Hyman.
- Harcourt, G. (1972). *Some Cambridge controversies in the theory of capital*. Cambridge, UK: Cambridge University Press.
- Harris, D. (1985). The theory of economic growth: From steady states to uneven development. In G. Feiwel (Ed.), *Issues in contemporary macroeconomics and distribution* (pp. 378-394). London: Macmillan.
- Harris, N. (1986). *The end of the third world*. London: Tauris/Penguin.
- Harrison, B., & Bluestone, B. (1988). *The great U-turn: Corporate restructuring, laissez faire and the rise of inequality in America*. New York: Basic Books.
- Harvey, D. (1982). *The limits to capital*. Oxford, UK: Basil Blackwell.
- Harvey, D. (1985). *The urbanization of capital*. Baltimore: The Johns Hopkins University Press.
- Harvey, D. (1989). *The condition of post-modernity*. Oxford, UK: Basil Blackwell.
- Hirschhorn, L. (1984). *Beyond mechanization*. Cambridge: MIT Press.
- Hoffman, K., & Kaplinsky, R. (1988). *Driving force: The global restructuring of technology, labor and investment in the automobile and components industries*. Boulder, CO: Westview.

- Hounshell, D. (1984). *From the American system to mass production, 1800-1932*. Baltimore: The Johns Hopkins University Press.
- Itoh, M. (1987). Skilled labour in value theory. *Capital and Class*, 31, 39-58.
- Jenkins, R. (1987). *Transnational corporations and uneven development*. New York: Methuen.
- Johanson, J. (1989). Business relationships and industrial networks. In *Perspectives on the economics of organization* (Crafoord Lectures 1, Institute of Economic Research, pp. 65-78). Lund, Sweden: Lund University Press.
- Katzenstein, P. (Ed.). (1989). *Industry and politics in West Germany*. Ithaca, NY: Cornell University Press.
- Kenney, M., & Florida, R. (1988). Beyond mass production: Production and the labor process in Japan. *Politics and Society*, 16(1), 121-158.
- Kern, H., & Schumann, M. (1987). Limits of the division of labour: New production and employment concepts in West German industry. *Economic and Industrial Democracy*, 8(2), 151-170.
- Knights, D., Wilmott, H., & Colinson, D. (Eds.). (1985). *Job redesign*. Aldershot, UK: Gower.
- Lazonick, W. (1990). *Competitive advantage on the shopfloor*. Cambridge, MA: Harvard University Press.
- Leborgne, D., & Lipietz, A. (1988). New technologies, new modes of regulation: Some spatial implications. *Society and Space*, 6(3), 263-280.
- Leborgne, D., & Lipietz, A. (1990). *Fallacies and open issues about post-Fordism* (Working Paper No. 9009). Paris: CEPREMAP.
- Lipietz, A. (1979). *Crise et inflation. Pourquoi?* Paris: Maspero.
- Lipietz, A. (1982). Toward global Fordism? *New Left Review*, 132, 33-47.
- Lipietz, A. (1983). *Le monde enchanté*. Paris: Maspero/La Decouverte.
- Lipietz, A. (1986). Behind the crisis: The exhaustion of a regime of accumulation. *Review of Radical Political Economics*, 18(1&2), 13-32.
- Lipietz, A. (1987). *Mirages and miracles*. London: Verso.
- Lipietz, A. (1988). *De L'Althusserisme et la théorie de la régulation* (Working Paper No. 8920). Paris: CEPREMAP.
- Littler, C. (1982). *The development of the labour process in capitalist societies*. London: Heinemann Educational.
- Mair, A., Florida, R., & Kenney, M. (1988). The new geography of automobile production: Japanese transplants in North America. *Economic Geography*, 64(4), 352-373.
- Mandel, E. (1975). *Late capitalism*. London: New Left Books.
- Marglin, S., & Schor, J. (Eds.). (1989). *The golden age of capitalism: Reinterpreting the postwar experience*. New York: Oxford University Press.
- Markusen, A., Hall, P., Deitrich, S., & Campbell, S. (1991). *The rise of the gun belt*. New York: Oxford University Press.
- Marshall, M. (1987). *Long waves of regional development*. London: Macmillan.
- Martinez, J., & Jaramillo, C. (1989). The evolution of research on coordination mechanisms in multinational corporations. *Journal of International Business Studies*, Fall, 489-514.
- Marx, K. (1967). *Capital* (Vol. 1). New York: International. (Original work published 1863)
- Mensch, G. (1979). *Stalemate in technology*. Cambridge, MA: Ballinger.
- Mistral, J. (1986). Régime international et trajectoires nationales. In R. Boyer (Ed.), *Capitalismes fin de siècle* (pp. 167-202). Paris: Presses Universitaires de France.
- Monden, Y. (1983). *Toyota production system: A practical approach to production management*. Atlanta: Industrial Engineering and Management Press.

- Moore, B. (1966). *The social origins of dictatorship and democracy*. Boston: Beacon.
- Morgan, K., & Sayer, A. (1988). *Microcircuits of capital*. Oxford, UK: Polity.
- Morris-Suzuki, T. (1988). *Beyond Computopia: Information, automation and democracy in Japan*. London: Kegan Paul.
- Mowery, D., & Rosenberg, N. (1976). The influence of market demand upon innovations: A critical review of some recent empirical studies. *Research Policy*, 8(2), 102-153.
- Nelson, R., & Winter, S. (1982). *An evolutionary theory of economic change*. Cambridge, MA: Harvard University Press.
- Page, B., & Walker, R. (1991). From settlement to Fordism: The agro-industrialization of the Midwest. *Economic Geography*, 67(4), 281-315.
- Peet, R. (1989). Conceptual problems in neo-Marxist industrial geography. *Antipode*, 21(1), 35-50.
- Perez, C. (1985). Microelectronics, long waves and world structural change. *World Development*, 13, 441-463.
- Perlo, V. (1982). The false claims of declining productivity and its political use. *Science and Society*, 46(3), 284-327.
- Piore, M., & Sabel, C. (1984). *The second industrial divide*. New York: Basic Books.
- Pollert, A. (1988). Dismantling flexibility. *Capital and Class*, 34, 42-75.
- Porter, G., & Livesay, H. (1971). *Merchants and manufacturers*. Baltimore: The Johns Hopkins University Press.
- Rosenberg, N. (1972). *Technology and American economic growth*. New York: Harper Torchbooks.
- Rosenberg, N. (1976). Technological change in the machine tool industry, 1840-1910. In *Perspectives on technology* (pp. 9-31). Cambridge, UK: Cambridge University Press.
- Sabel, C. (1982). *Work and politics*. New York: Cambridge University Press.
- Sabel, C. (1989). Flexible specialization and the reemergence of regional economies. In P. Hirst & J. Zeitlin (Eds.), *Reversing industrial decline?* (pp. 17-70). New York: St. Martin's.
- Sabel, C., Heerigel, G., Kazis, R., & Deeg, R. (1987). How to keep mature industries innovative. *Technology Review*, 90(3), 26-35.
- Sabel, C., & Zeitlin, J. (1985). Historical alternatives to mass production: Politics, markets and technology in nineteenth century industrialization. *Past and Present*, 108, 133-176.
- Sahal, D. (1981). *Patterns of technological innovation*. Reading, MA: Addison-Wesley.
- Sassen, S. (1988). *The mobility of labor and capital*. New York: Cambridge University Press.
- Saxenian, A. (1991). The origins and dynamics of production networks in Silicon Valley. *Research Policy*, 20(5), 423-438.
- Sayer, A. (1984). *Method in social science: A realist approach*. London: Hutchinson.
- Sayer, A. (1986). New developments in manufacturing: The just-in-time system. *Capital and Class*, 30, 43-72.
- Sayer, A. (1988). Post-Fordism in question. *International Journal of Urban and Regional Research*, 13(4), 666-693.
- Schoenberger, E. (1988). From Fordism to flexible accumulation: Technology, competitive strategies and international location. *Society and Space*, 6(3), 245-262.
- Schoenberger, E. (1990). Some dilemmas of automation. *Economic Geography*, 66, 232-247.
- Schumpeter, J. (1934). *The theory of economic development*. Cambridge, MA: Harvard University Press.

- Schumpeter, J. (1939). *Business cycles*. New York: McGraw-Hill.
- Scott, A. (1988a). *Metropolis: From the division of labor to urban form*. Berkeley: University of California Press.
- Scott, A. (1988b). *New industrial spaces*. London: Pion.
- Scott, A., & Storper, M. (1990). *Regional development reconsidered* (Working Paper No. 1). Los Angeles: UCLA, Lewis Center for Regional Policy Studies.
- Shaikh, A. (1987). The falling rate of profit and economic crisis in the United States. In R. Cherry (Ed.), *The imperiled economy* (Vol. 1, pp. 115-126). New York: Union for Radical Political Economy.
- Smith, N. (1984). *Uneven development*. Oxford, UK: Basil Blackwell.
- Soja, E. (1989). *Post-modern geographies*. London: Verso.
- Standing, G. (1992). Alternative routes to labour flexibility. In M. Storper & A. Scott (Eds.), *Pathways to industrial and regional development*. London: Routledge.
- Storper, M. (1987). The post-enlightenment challenge to Marxist urban studies. *Society and Space*, 5(4), 418-426.
- Storper, M. (1989). The transition to flexible specialisation in the U.S. film industry: External economies, the division of labour, and the crossing of industrial divides. *Cambridge Journal of Economics*, 13, 273-305.
- Storper, M., & Scott, A. (1988). The geographical foundations and social regulation of flexible production complexes. In J. Wolch & M. Dear (Eds.), *The power of geography* (pp. 21-40). Boston: Allen & Unwin.
- Storper, M., & Scott, A. (Eds.) (1992). *Pathways to industrialization and regional development*. London: Routledge.
- Storper, M., & Walker, R. (1989). *The capitalist imperative: Territory, technology and industrial growth*. Oxford, UK: Basil Blackwell.
- Sturgeon, T., & Walker, R. (1991). *Speculative urbanization in Silicon Valley: The building boom of the 1980s*. Unpublished manuscript, Department of Geography, University of California, Berkeley.
- Sweezy, P. (1942). *The theory of capitalist development*. New York: Monthly Review.
- Tedlow, R. (1990). *New and improved: The story of mass marketing in America*. New York: Basic Books.
- Van Duijn, J. (1983). *The long wave in economic life*. London: Allen & Unwin.
- Walker, R. (1977). *The suburban solution: Capitalism and the construction of urban space in the United States*. Unpublished doctoral dissertation, Department of Geography and Environmental Engineering, The Johns Hopkins University, Baltimore.
- Walker, R. (1985a). Is there a service economy? The changing capitalist division of labor. *Science and Society*, 49, 42-83.
- Walker, R. (1985b). Technological determination and determinism: Industrial growth and location. In M. Castells (Ed.), *High technology, space, and society* (pp. 226-264). Beverly Hills, CA: Sage.
- Walker, R. (1988a). The dynamics of value, price and profit. *Capital and Class*, 35, 147-181.
- Walker, R. (1988b). The geographical organization of production systems. *Society and Space*, 7, 377-408.
- Walker, R. (1989a). Machinery, labour and location. In S. Wood (Ed.), *The transformation of work?* (pp. 59-90). London: Unwin Hyman.
- Walker, R. (1989b). A requiem for corporate geography: New directions in industrial organization, the production of place and uneven development. *Geografisker Annaler*, 71B(1), 43-68.

- Walker, R. (1989c). What's left to do? Theses on a flyer back. *Antipode*, 21(2), 133-165.
- Walker, R. (1993). The hidden dimension of industrialization: An expanding division of labor. *Futures*, 25(6), 673-693.
- Webber, M. (1990, April 23). *Fordism, post-Fordism, flexibility and all that*. Paper presented to the Association of American Geographers, Toronto.
- Webber, M., & Rigby, D. (1986). The rate of profit in Canadian manufacturing. *Review of Radical Political Economics*, 18, 33-35.
- Webber, M., Sheppard, E., & Rigby, D. (1990). *Technical change*. Unpublished manuscript, Department of Geography, University of Melbourne.
- Williams, K., Cutler, T., Williams, J., & Haslam, C. (1987). The end of mass production? *Economy and Society*, 16(3), 405-439.
- Williamson, H. (Ed.). (1951). *The growth of the American economy*. New York: Prentice Hall.
- Wood, S. (Ed.) (1989). *The transformation of work?* London: Unwin Hyman.
- Zuboff, S. (1988). *In the age of the smart machine*. New York: Basic Books.