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Exploring a Role for Capability Theory in the SSA Approach

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Abstract: This paper explores the potential for integrating the theory of “organizational capabilities” into the Social Structures of Accumulation (SSA) approach. While the latter is well known in Marxian scholarship, capability theory is less so. In one useful definition, “an organizational capability refers to the ability of an organization to perform a coordinated set of tasks, utilizing organizational resources, for the purpose of achieving a particular end result” (Helfat and Peteraf 2003, 999). Dating back at least to Edith Penrose (1959), capability theory is often pursued within the context of evolutionary economics (Nelson and Winter 1982), as it focuses on path-dependent development of the firm’s ability to survive within its competitive environment. I argue that capability theory can deepen an SSA understanding of how the institutional structure of capital accumulation reaches into, and is in turn affected by, competitive dynamics at the firm and industry levels. This argument is illustrated with two preliminary applications: to the breakdown of the post-war SSA in the U.S., and the likely pressures of climate change in the construction of a new SSA after the current crisis.

Key Words: Social structures of accumulation; organizational capabilities; climate change

Introduction

The resurgence of scholarly interest in Marxism in the late-sixties U.S. brought with it a strong focus on the organizational processes and relationships by which surplus value is extracted. Important examples were Marglin (1974), who traced the productivity gains in the earliest factories not to changed technology, but rather to intensified supervisory pressure; and Stone (1975), who analyzed how steel companies re-configured intra-working class and worker-capitalist relations in the context of late-nineteenth century technological advance. Gordon, Edwards and Reich followed (1982) with a theory of capitalist development through “social structures of accumulation” (SSAs), centered around the organization of work and workers in the firm but tying that to a broad network of institutions that affect surplus value and capital accumulation. While SSA theory has continued to be an important strand within Marxian analyses of capitalism (see McDonough 2008 for a recent review), its trajectory has led somewhat away from the initial focus on organizational processes and relationships. In this paper, I propose renewing that emphasis within SSA research by bringing to bear insights from evolutionary theories of organizational capability.

“Organizational capability” (OC) refers to the capacity to mobilize and deploy resources at the firm level in competitively useful ways. The genealogy of the concept goes back at least to Edith Penrose (1959), who argued that effective competition depends on the firm’s ability to deploy resources in ways that are idiosyncratically based on its managers’ evolving perception of investment opportunities. A focus on the emergence of capability over time in relation to the firm’s external competitive environment made it natural for the theory to develop within the broad context of the “evolutionary economics” of Nelson and Winter (1982). Some early OC theorists placed the idea firmly within the context of broad sets of institutional arrangements (Lazonick 1990, Chandler 1992). Just as with early SSA authors’ emphasis on organizational processes, that interest has tended to diminish, as recent OC research has focussed more on capability within the firm or, at most, in relation to the immediate industry setting.

I propose that pursuing the initial inclination of both SSA and OC theorists, to examine organizational dynamics in the capitalist firm within a broader institutional context, can allow the two approaches to complement one another in flexible and powerful ways. By highlighting firm level dynamics, insights from OC research can deepen our understanding of how SSAs function, break down, and are reconstructed. I will argue that the two frameworks are a good fit because OC theory addresses the labor process, focuses on organizational change in relation to the firm’s external environment, is (like most Marxian approaches) methodologically holistic rather than atomistic, and contains a democratic bias.

The paper is organized as follows. The next section gives a very brief overview of SSA theory, emphasizing those aspects that are most germane to this study. Then OC theory is explored in somewhat more detail, given its lesser familiarity to many Marxian researchers, but again with a focus on those elements most relevant to the SSA approach. The argument is then illustrated in a preliminary way by means of two historical applications: the breakdown of the post-World War II U.S. SSA in the context of competition with Japanese capital, and likely constraints imposed by climate change on efforts to rebuild an SSA in the U.S. after the present crisis. A final section concludes.

The SSA and organizational dynamics

An SSA refers to the set of economic, political, and other institutions that provide the broader context within which capital accumulation occurs. These institutions are typically thought to encompass labor market structures, credit markets and practices, legal and regulatory systems, and the like. While it is acknowledged that almost any social institution affects accumulation in some way, those comprising the SSA are the ones that impinge directly and significantly upon accumulation by individual capitalists and firms (Gordon, Edwards and Reich – henceforth “GER” – 1982).

It will be useful in the present context to focus briefly on the interface in SSA theory

between firm-level accumulation and the institutional environment. GER argue that “the microeconomic activity of profit making and reinvestment” occurs at the firm level along with its concomitant, “how each individual capitalist goes about organizing the labor process” (1982, 25). While these individual activities are not part of the SSA, they are associated with its “customary... organization of the labor process” (25) and various closely related institutions. That “customary organization” might be thought of as a kind of received wisdom, a set of “best practices” nested firmly within a corresponding set of supporting institutional arrangements. GER, indeed, provide clear descriptions of the customary firm level labor processes characterizing each of the stages of U.S. capitalism that they analyze (1982): how the organization of skills, technologies, and both intra- and inter-class relationships are combined by successful capitalist firms (within corresponding institutional settings) to create profitability and enable capital accumulation.

That association, between organization-level labor and related processes on the one hand and their institutional framework on the other, plays an important role in SSA theory’s understanding of historical transitions from one stage of capitalism to another. The increasing success of growing numbers of firms, in doing what the institutional framework has facilitated, begins to put pressure on the capacity of key institutions to provide the requisite support. As isolated problems generalize to crisis and the SSA enters a period of decay, innovative capitalists are already experimenting with new ways of doing things. These explorations will seed the growth of new forms of “customary organization,” both shaping and being shaped by the development of new institutional frameworks.

For example, the “homogenization” stage emerged in part out of firms’ efforts to reduce the pivotal role of skilled workers by means of “new methods of mechanization, [and] new production techniques...” that “reduced required skills to the barest minimum” (GER 1982, 113). Mass production organized around the assembly line, growing ranks of foremen and supervisors, and professional personnel departments were all important innovations. These firm level changes became new forms of customary organization – a “drive system” exercising “technical control” (Edwards 1979) – in conjunction with an SSA involving capital market-supported corporate consolidations, aggressively nationalist and anti-union employer associations, a co-opted craft trade union movement, and other key institutional supports. Eventually, the vigor of these changes created new pressures – as, for example, reduction to common skill denominators within large industrial workforces encouraged workers to respond to the drive system via a reawakening of industrial unionism.

Thus the understanding of capitalist firms’ evolving skill sets and practices has from the start played an important role in SSA theory’s very Marxian vision of contradictory growth and change. While more recent authors have tended to emphasize macro-level processes, some have continued to explore this role. Prechel (2000) has argued that “without understanding the intricate and routine day-to-day organizational processes it is

hard to understand how social structures are constructed...” (6). He is explicit that firms “do not simply react to the institutional arrangements,” but rather seek to influence them, and that this extends to both the economic and the political institutional realms (7). His key areas of interest lie in changes in corporate form and in managerial decision and control systems. It is the latter that especially align with the focus in the current study on organizational practices and expertise: “Change in the managerial process occurs in response to micro-meso contradictions”, when decision and control methods are no longer effective in serving a changed “corporate structure and agenda” at the institutional interface between firms and their macro-environment (251).

While Prechel’s analysis of organizations in the midst of historical SSA transitions revolves mainly around access to financial capital, Lippit’s broader reformulation (2005) touches more upon the importance of business practices in constituting the capital-labor elements of an SSA. Lippit analyzes what knits a collection of institutions into a coherent “structure,” why those structures tend to persist over long periods of time, and how the (also lengthy) processes of breakdown and reconstitution are driven. In answering each of these questions, he focuses partly on the inertial effects of custom and expectations. These effects channel how capitalist firms and their managers and workers relate amongst themselves and to other entities in their external environments. Lippit looks not only at the historical dimension of particular SSAs, but also at their differences across countries. He examines the emergence and breakdown of the Japanese SSA dominant from the 1960s to the 1980s, based on mutually reinforcing state leadership, corporate/banking Keiretsu, large firms’ seniority-based lifetime employment, a competitive educational system, and supportive families. While noting that this constellation when working well encouraged firm-specific employee expertise acquisition, he does not make the additional connection with the corresponding “customary organization of the labor process” (in GER’s terms, 1982): the much-studied Japanese practices of total quality management and just-in-time production (see, for example, Garvin 1983).

The research literature on organizational capabilities, in contrast, has studied extensively the evolution of these Japanese management practices, how they have differed from dominant approaches among U.S. firms, and the role each set of practices has played as the two countries’ capitalists have seen their fortunes ebb and flow over time. The forms of customary organization of the labor process are important loci of dynamism, breakdown, experimentation and change as SSAs move through time. Thus introduction of key concepts from capability theory may contribute significantly to the power and flexibility of the SSA approach.

Organizational capabilities and SSA theory

There is a huge and multi-faceted research literature on OCs. After a very basic

introduction, I will focus on those aspects of OC theory that are most relevant to the SSA approach. A good starting definition comes from Helfat and Peteraf (2003): ‘an organizational capability refers to the ability of an organization to perform a coordinated set of tasks, utilizing organizational resources, for the purpose of achieving a particular end result.’ (999). Because “particular end result” refers typically to survival within an external competitive environment, the OC approach fundamentally involves looking at what firms can do well relative to both one another (the industry) and the broader market setting (the opportunities and threats posed by changing demand, technology, regulation, and so on). Researchers have used this concept to understand sources of differential competitive success across firms, processes of innovation (in products, processes, and organization itself), and change. This firm-environment relationship is bi-directional, a point to which I will return below.

Research in OC theory became associated very early with the “evolutionary economics” initiated by Nelson and Winter (1982). They argue that the informational environment is truly uncertain, decision makers’ cognition is limited, and – therefore – firms operate on the basis of combinations of “routines”: repetitively patterned ways of finding and processing information. Effective routines must be coherent with one another and must work well enough to effect the firm’s survival given the demands of its competitive environment. In most OC research, organizational routines are thought to underlie capabilities (Becker 2004).

The operation of routines in the creation and implementation of capabilities implies that firms know what to do and how to do it, whether tacitly or explicitly. Thus another important stream within OC research has to do with organizational knowledge and learning: “...the knowledge base of the firm as leading to a set of capabilities that enhance the chances for growth and survival” (Kogut and Zander 1992, 384). That capability flows from a knowledge base links the firm to the realms of technology, science, and management doctrine. To some extent, routinized knowledge is codified and cognitive; but in many respects it is tacit, helping to make the underlying capabilities difficult to imitate but also imbuing them with inertia and helping to make them difficult to change (Cohen et al. 1996).

How capabilities change and organizations adapt has become in the past fifteen years the subject of a major stream within OC theory, the study of “dynamic capability.” Nelson and Winter had earlier discussed the problem in terms of ‘search’: ‘routine-guided, routine changing processes,’ themselves routines that ‘operate to modify over time various aspects of operating characteristics’ (1982, 17-18). Teece and collaborators and explore its importance in managerial processes (Teece et al. 1997): “We define dynamic capabilities as the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments. Dynamic capabilities thus reflect an organization’s ability to achieve new and innovative forms of competitive advantage given path dependencies and market positions” (516).

Particularly in the context of SSA theory, the relationship of dynamic capability to the broader range of OCs is important. Winter (2003) suggests that the firm's set of OCs geared toward performance within a given competitive environment be considered "zero-order capabilities" (992); dynamic capability, then, can be thought of as specializing in first-order change, modifying zero-order capabilities in response to significant change in the competitive environment. Key concerns in this part of the literature have included the extent to which a given body of zero-order or static capabilities is path-dependent and change-resistant, a question of critical relevance in understanding SSA persistence as discussed by Lippit (2005). A related issue is how much purposeful control managers exercise over changing capability. Zollo and Winter (2002) emphasize the deliberative aspect of dynamic capability and tie it to processes of articulation and codification of new knowledge. Other authors have argued that experiential, behavioral, or ad-hoc learning may also be important in dynamic capability within certain settings – for example, in smaller firms and/or turbulent market transitions.

While recent OC research has tended to focus mainly on organization-level response to changes in the external environment, some earlier work directed more attention at the way that firms' capabilities are embedded within systemic institutional influences. Chandler (1990, 1992) analyzes structural differences between the U.S., Germany, and England during the first three-quarters of the twentieth century. In the U.S., for example, Chandler argues that a system of "competitive managerial capitalism" arose through and supporting the ascent of giant U.S. industrial firms as they built capabilities in manufacturing, marketing, and management. Chandler sees these capabilities as having been linked to generalized changes in corporate form (the multidivisional firm) and globalization (international markets). In a related body of work, Lazonick (see for example 1990, 1994) argues that competitive capabilities emerge within a "mode of social organization" comprised of systems of labor training and control, supply chain relationships, capital access, education, and social status. Lazonick is especially interested in modes of social organization as powerful influences on the differential abilities of firms in particular countries to develop the OCs necessary for successful global competition. For example, he argues that in the decades around the turn of the last century, efforts by some British capitalists to break their craft unions were hampered by the absence of institutional supports for managerial coordination and technological innovation, as existed in the U.S. Thus the struggle to build new OCs both shaped and was shaped by the very different interacting webs of related institutions in each country.

The analytical kinship between OC theory and an SSA type of analysis is quite explicit in Lazonick's work. In addition, many concepts from the other OC authors and research streams discussed above offer the potential for complementarities with SSA theory. I will focus on two key ways in which OC theory can contribute to our understanding of SSAs. One is in analyzing the labor process. Capitalist firms differ in their OCs for combining

technologies, work organization, labor-management systems, and the labor-capital relationship; but in the institutionally-linked patterns revealed through those differences there emerges a customary labor process form that is central in characterizing an SSA. And OC research offers fine-grained insights into those phenomena. A second key potential contribution is in understanding SSA transitions over time. When emergent contradictions at the institutional level begin to impede profitability and accumulation, firms' OCs are confronted with challenges. Capability and underlying routine can hamper recognition and response, but some firms' strong dynamic capabilities allow them to explore new approaches. The particular content and distribution of those capabilities and approaches may, in turn, shape the emergence of new institutional arrangements.

I turn now to exploring these contributions, in a very preliminary way, by means of two brief applications.

Preliminary illustrations

Japan, the U.S., and the post-war SSA

From GER (1982) onward, SSA theorists have developed a broadly shared understanding of the decay of the post-World War II U.S. SSA. Beginning in the late 1960s, capital's "accords" with labor and the citizenry became increasingly costly. A sustained period of vigorous accumulation, whose benefits were widely shared relative to other capitalist eras, began to push up unit labor costs and restrict capitalists' bargaining power and adaptive flexibility. In the context of increased competition from Japanese and European firms whose economies had by then recovered from the war, rising costs at home spelled trouble for erstwhile dominant U.S. corporations. Breakdown in the "Pax Americana," triggered especially by the Vietnamese and then by OPEC, was a final straw. Profitability fell and the existing institutions were incapable of mediating its restoration through normal cyclical dynamics. The scramble was on to define new rules of the game.

As Naples (1996) points out, it can be tempting to look back at historical SSA transitions as if their timing, contours, and outcomes were obvious. But why were U.S. firms so inflexible in their response to the international challenge? Manufacturers in Japan, Germany, and Sweden, for example, in industries like auto, also employed highly paid labor enjoying very different but in every case very strong institutional protections. Yet the SSAs in these countries responded in very different ways than in the U.S. to crisis in the 1970s. OC theory can help explain why U.S. capitalists could not regain their footing still within a context of strong but narrow trade unions and an extensive social safety net, but moved instead to build a new institutional context around neoliberalism.

I will focus on the U.S. response to the challenge of "Japanese management," by the late 1970s probably the key salience point in the perception of crisis among U.S. capitalists and business theorists (see for example Hayes and Abernathy 1980). Underlying the post-war SSA's customary labor process, with its segmentation and technical control, was a set of OCs based in a strongly American separation of conception and execution. Firms in

industries from consumer electronics to auto generated acceptable levels of productivity and quality if they were capable of meeting industry standards of automation, deskilled labor subordination, and monitoring and supervision by growing ranks of low-to-mid-level management. Product and process design were engineering by management and it was management's job to enforce their implementation by workers. All of these capabilities were shaped by the drive system created by dominant firms in the formation of the previous SSA and were supported by the institutions of the current one.

An important aspect of this system was the rigid separation of the design, manufacturing, and customer contact functions. Just as workers were not permitted to interface with product and process design, employees in each functional area were expected to focus exclusively on its tasks as defined by management, and all of their interactions with those tasks were mediated by chains of managerial command reaching vertically through the functional division and then into the corporate level. So companies developed product design capabilities, for example, based on the design department's interpretation of what would sell, not systematic interaction with the customer sales and service function, or with the manufacturing function where design was translated into what the customers would experience. (Detroit, for example, came to excel at boosting power and increasingly flashy cosmetic design changes that advertising and weak competition parlayed into massive profits.) OC theory has come to understand these post-war boom capabilities as having been based on low levels of "internal and external integration" (Baldwin and Clark 1991): The customary labor process did not encourage flows of information horizontally within the firm (Aoki 1990) or between the firm and its external environment.

This class of capabilities worked well during the earlier post-war period of unchallenged U.S. corporate dominance in most industries, with its less intense quality competition on the demand side, and muted cost pressures on the supply side. The end of that era as institutional breakdown, summarized above, has been well explored in SSA theory. What has been more fully studied in OC research is how the very strength of what U.S. firms could do well hampered and channelled their response to the Japanese challenge when it came. Japanese success in industries from color televisions to auto to air conditioners revolved around industry-specific versions of OCs in several interconnected areas (Garvin 1983). One was rapid product cycles, so that changes in demand could quickly be exploited. Another was cross-functional feedbacks, so that product design reflected customer feedback from sales and service, and production engineering could be adjusted to improve product quality and reduce scrap rates. Yet another was rapid, incremental innovation as shop floor experience generated a stream of very small, process-specific technical changes. These OCs worked together to foster high quality, low costs, and strong competitive performance (Lazonick 1994). They were all tightly connected to the features of the 1960s-1980s Japanese SSA described by Lippit (2005). These are the elements of the "customary labor process" that encouraged firm-specific

learning and effort by employees in the context of big-firm lifetime employment within the Keiretsu and its associated institutions.

Many U.S. firms experimented with these approaches in the 1980s and 1990s (Bushnell 1994). But the extent to which these experiments created durable change was limited. The basic capabilities entailed by the Japanese system were at odds with those deeply ingrained in U.S. companies. More common was a kind of hybrid, in which selected aspects of the Japanese approach to quality were grafted on to emerging U.S. corporate downsizing and deskilling campaigns (Osterman 1994, Biewener 1997). It is true that the Japanese-inspired practices were incompatible with the surrounding institutions of the post-war SSA, and that this would have inhibited their adoption and dissemination. But the crucial point is that these institutions were already under siege as the SSA decayed. What needs to be explained is why these seemingly promising labor-process and related experiments at the firm level did not eventuate in compatible, reconfigured institutional arrangements. The answer, from an OC theoretic perspective, is that path dependency had wired quasi-Taylorist capabilities too deeply into the makeup of too many U.S. firms. Far more compatible was the kind of hybridization mentioned above, alongside other firm level innovations compatible with institutional reconfiguration in a very different direction: neoliberalism.

The preceding material suggests that ex post, OC theory can deepen our understanding of the dynamics of SSA breakdown and reconstruction. A further question is whether the OC approach might help us anticipate the likely direction of change ex ante during a period of SSA decay. Whether OC theory can bring predictive power to the SSA approach can be explored through an examination of the implications of climate change in the current conjuncture.

Climate change and the U.S. SSA

The current period is seen by many authors as witnessing the breakdown of a neoliberal globalized SSA (Kotz 2009). It has also been argued that climate change induced by economic activity poses a profound challenge to the ability of the capitalist system to construct a viable successor (Li 2008, 2009). Li (2008) points out that emissions are a function of output, the energy intensity of output, and the carbon intensity of the energy used. He argues that even very optimistic scenarios with respect to changes in the last two factors will result in catastrophic atmospheric carbon concentrations, given capitalism's need for growth. On these bases, Li constructs a powerful argument for socialism.

Other than Li's work, however, I am not aware of research touching upon the SSA framework that examines the role of environmental problems in the changing trajectory of capital accumulation. (Zuindeau 2007 is one among at least a few authors looking at this issue within the Regulation school.) The key point in terms of SSA transition is that it is unknown how rapidly climate change will impose severe constraints on the profit-making

and reinvestment activities of capitalists in various sectors. Whether this will occur within a time frame relevant for the coming efforts to reconstruct the U.S. SSA will depend on how scientific evidence, public perceptions of that evidence, and policy responses continue to evolve in the coming years.

To the extent that these phenomena contribute to rapidly escalating market and regulatory pressures, firms in key sectors will face acceleration in already-rising demands for new, carbon-reducing product and process technologies. Even the U.S. is now moving quickly to put a price on carbon emissions, and this will impose costs especially on the majority of firms that have been slow to shift toward lower-carbon products and processes. Insurance, credit market, and litigation risks related to excessive greenhouse gas emissions may also become important factors in particular industries.

Bringing OC theory to bear suggests three questions with respect to the implications of climate change for SSA reconstruction. First, what experiments are going on in the critical technological capabilities required to sharply reduce carbon emissions for a given amount of output? Second, what kinds of changes in the institutional environment would be required for those experiments to become generalized and provide the foundation for a new SSA? And third, how would customary labor processes within U.S. capitalism need to evolve in conjunction with new technological capabilities and institutional arrangements?

Unlike in Li's analysis (2008, 2009), carbon producing technologies and patterns of economic activity are not simple functions of macroeconomic output and growth. The fossil fuel-based technology in place within advanced capitalism coevolved with a wide-ranging set of complementary managerial and work system capabilities (Hart 1995, Hoffman 2003). These capabilities developed over more than a century's time when environmental concerns were unknown (and then ignored or resisted), and fossil fuel energy sources were plentiful, cheap, and subsidized in many ways (Goldstein 2002). They lie at the heart of our economy's transportation, habitation, agricultural, and industrial products, processes, and systems.

A recent Citigroup and World Resources Institute report (Suozzo 2006) analyzes new technologies with carbon emission-reducing potential, using categories that closely mirror Li's account (2008). They are as follows: increased energy conversion efficiency (especially energy efficiency in buildings and appliances, industrial processes, and vehicles); reduced carbon intensity of energy (especially non-fossil fuel power sources in electricity generation and transportation); and carbon sequestration and storage (e.g., enhanced oil recovery CO₂ injection and integrated gasification combined-cycle coal-fired power plants). The Citigroup focuses on profit opportunities for a handful of companies that are already investing heavily in the requisite OCs for developing and exploiting these technologies: General Electric (wind turbines, efficient diesel and diesel-hybrid locomotives, gasification), Magna International (lightweight, composite and new-alloy metal vehicle body and drive-train parts), Johnson Controls (architectural energy technologies and management

systems, new vehicle battery technologies), and others. A 2007 follow-up report (Keschner and Gerachty 2007) expands that list to 74 firms.

Options for change in the institutional framework will be shaped by these scattered firm and industry level responses already emerging. Some key companies and sectors will see it in their interest to combine new capability building, in low-carbon technologies, with a political stance favoring the kind of aggressive regulation that would reward those investments. (DuPont is widely recognized as having profited from such a combined strategy around chlorofluorocarbon substitutes and the Montreal Protocol.) This strategic combination is likely to provide the basis for efforts at capitalist-led coalition building toward new, climate and capital accumulation related institutions. Regulation, education and training, public infrastructure investment, R&D subsidies, capital market standards and incentives – all will be up for grabs. (I will return below to the implications for labor processes.)

On the other hand, the time path and distribution of relevant OCs throughout the U.S. economy may make it extremely difficult for such a coalition to garner the support required for corresponding types of institutional reconfiguration. The old capabilities are interpenetrated with the corresponding scientific, financial, and regulatory institutional environment, and the dynamics of institutional change will be constrained by those capabilities. Consider, for example, the U.S. auto industry. The recent collapse of the U.S. auto firms is in no small part a function of their long term reliance on OCs required for delivering large, powerful, fuel inefficient vehicles. With the survival of at least General Motors and Chrysler in the hands of the U.S. government as of this writing, it seems likely that a continued major role for Detroit will be predicated on a commitment to move away from those historic but long-dysfunctional capabilities. But these firms have lagged badly behind other countries' producers, especially Toyota and Honda, in learning how to make more energy-efficient and cleaner-running cars.

There is a related political dimension to the problem as well. In recent decades, many U.S. manufacturers have expended more resources fighting public action on climate change than on building the technological capabilities required to cope with and even profit from a carbon-constrained accumulation process. For example, half-hearted fuel-efficiency innovation efforts by U.S. automakers were accompanied by whole-hearted lobbying in opposition to tighter fuel efficiency standards (Goldstein 2002). This kind of political response is also a product of routinized organizational capability. Because of the pivotal direct and indirect role of auto in the U.S. economy, sluggish climate-capability response in that sector may be an ongoing drag on capital accumulation nationwide and an impediment to SSA renewal. And the pattern exists in other industries as well.

This prognosis is strengthened by the fact that even rather fundamental changes in the technology of individual motor cars and trucks will almost certainly not solve the climate change problem. Even very efficient, very low carbon vehicles will be incompatible with

acceptable atmospheric carbon levels if their proliferation continues in the advanced and emerging economies. This problem is mirrored when looking at energy and carbon efficiency changes in other sectors of the economy as well. Thus qualitatively relaxing climate change constraints on accumulation will require, at some foreseeable future point, institutional changes capable of supporting fundamental changes in transportation, habitation, agricultural, and industrial systems. Dispersed living and producing patterns knit together by individual cars and trucks, with global food and other commodity chains, will have to give way to new patterns. Effecting this kind of fundamental change in conjunction with fostering the requisite, corresponding OCs at the firm level will be a tall order indeed for SSA reconstruction – now or in the future.

I return here briefly to the role of “customary labor processes” in these dynamics. The two illustrations chosen for this study are perhaps related, in that the kinds of internal and external integration that are thought to have enhanced dynamic capability within many Japanese firms will be critical to the development in the U.S. of new, lower-carbon products and processes and the needed OCs. I argued above that this source of dynamic capability has historically been at odds with customary U.S. labor processes. Although OC theory has not emphasized it, there is a class power dimension to productive OCs (Appelbaum and Batt 1994). Firms’ long-standing ways of competing successfully in products and processes entail deeply ingrained balances of power and prerogative. In any country and SSA period, these balances must be consistent with firm level OCs on the one hand and institutional arrangements on the other. Many OC theoretic authors in environmental innovation research have argued that more fully mobilizing the workforce at all levels will be necessary in identifying and transcending companies’ myriad sources of carbon-intensity (Hoffman 2003). OC theory would also suggest that along with greater worker participation must come increased job security and improved labor relations generally (Pfeffer 2007). Both firm and institution level changes in this direction would require, of course, a sharp about-face with respect to critical aspects of the neoliberal regime.

A related strategic issue has to do with capital-trade union relations vis-à-vis climate change. Traditionally, many U.S. trade unions have allied themselves politically with “their” capitalists in seeking political protection for firms and industries, on issues ranging from trade to the environment. Firms’ cultivation and pursuit of, and unions’ use of, this kind of alliance have been based upon mutually reinforcing OCs for each. Nevertheless, labor’s approach to the environment is complex, with a great deal of variation and flux in specific union organizations’ capacities to redefine their interests and relationships. Unions like firms undergo organizational learning in response to major changes in their surroundings (Obach 2004). A number of recent initiatives point to the potential for organized labor to play a role in pushing for increased capitalist commitment to the kinds of product and process changes that would relax or even reverse the purported “jobs vs the environment” tradeoff that has so animated these debates in the past.

But U.S. corporations' history of Taylorist labor processes, and the harsh anti-union tenor of the neoliberal stage in particular, will impose significant obstacles to U.S. capital acquiescing in a new SSA constructed around institutions, labor processes, and productive OCs capable of relaxing for long the constraints on capital accumulation created by climate change. From the perspective of the working class and its allies, however, OC theory can help point toward the kinds of technological, labor-capital, and institutional changes that are consistent with human well-being in the face of climate change. Demands for climate-related "radical reforms" – those whose achievement strengthens the working class, and whose denial exposes the need for revolutionary transformation – will be especially important during the transitional phase sure to follow the present financial and economic crises.

Conclusion

Both of the above illustrations will require in-depth treatment for the analytical power of the arguments being proposed to be assessed. What I have tried to accomplish here is simply to point out the potential for OC theory to add to our understanding of how SSAs are constructed, function, break down and change. Capability theory has arisen as a full blown research approach only in the decades since the breakdown of the post-war SSA during the 1970s. We can better understand the current crisis if we bring this rich and varied body of knowledge to bear in assessing the roots of decay and possible future developments.

This paper has argued that OC theory offers a powerful set of ideas for analyzing labor processes at the firm level, and how those processes are connected to the broader institutional environment. It has also attempted to demonstrate that the OC approach provides explicit tools for understanding how firms and the institutional environment interact during periods of major SSA change. There are two additional, attractive dimensions to OC theory in relation to the SSA approach that I will mention in concluding.

One is that OC theory is in certain respects methodologically akin to many radical political economy approaches, and similarly hostile to mainstream economic orthodoxy, in its focus on social processes rather than atomistic choice. The contrast with orthodoxy was brought out especially in the 1990s, when OC researchers had to respond to mainstream cooptation efforts (Milgrom and Roberts 1990, Williamson 1999). Capabilities evolve through human interaction within organizational contexts that matter to both the character of the interaction and the outcome (Aoki 1990, Chandler 1992, Hodgson 1998). This methodological commitment is further similar to radical Keynesian notions of uncertainty (Crotty 1993) versus optimal choice from probabilistically known alternatives: "(T)he orthodox canon...abstracted from the uncertainty...the uneven, groping character of

technical advance, and the diversity of firm characteristics and strategies – that is, from the key features of the capitalist dynamic.... There is no reason to believe that...the ‘habitual reactions’ of extant firms include the reaction patterns that are the best in a broader set of possibilities” (Nelson and Winter 1982; 28, 142).

OC theory also can have a strongly democratic bias due to its emphasis on the role of workers in building capabilities. Organizational learning is seen as enhanced by accessing tacit knowledge at the shop floor level (or its equivalent in a non-manufacturing setting) and combining it cross-functionally with constructed information from within and without the firm. Internal integration matters to capability formation and especially the operation of strong dynamic capability. But internal integration is often thought to require participatory work practices and commitment by the firm to stable and rewarding employment (Pfeffer 2007). U.S. companies’ retrograde performance in this regard has been widely noted by practitioners, as for example in this quote from one of the leaders of the “quality” movement so heavily studied by OC researchers: “(T)he collective worker education, experience, and creativity is the major underemployed asset in the economy of the U.S.” (Juran 1978, 16, emphasis in the original).

In neither of these respects, regarding methodology or class, has the OC approach adequately incorporated issues of class and power. It thus has much to learn from Marxian approaches like SSA theory. Most OC research takes place within the strategic management and related disciplines, where capitalist control is unchallenged and capitalism is presumed to be the only interesting or even conceivable form of society. Nevertheless, the potential is there – at both the methodological and applied levels – for insights from OC theory to leaven and deepen SSA analysis by re-linking it with issues of organizational process and change.

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