THE ORGANIZATION OF WORK IN A SEGMENTED ECONOMY

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Stratification researchers have increasingly embraced segmentation perspectives, dividing industries into groups believed to exhibit different work arrangement and opportunity structures. Previous research, however, indicates only limited support for those predictions. This paper assesses the utility of segmentation approaches by conceptualizing and measuring sectors organizationally, rather than among industries. Center and periphery enterprises are distinguished along two interrelated dimensions: the complexity of their organizational forms (size, structure, and technology) and the degree of market power or environmental dominance. These dimensions are operationalized and tested in analyses of more than 400 work organizations. Our formulation captures predicted organizational differences in work and opportunity. For example, as hypothesized, establishments that are high on these dimensions rely more on internal career ladders and the proliferation of job titles. While coarse taxonomies of economic segmentation may accurately represent the economic extremes, however, they obscure the diversity of enterprises between those extremes. Stratification and work arrangements can be better understood by analyzing their specific organizational and environmental determinants.

Students of stratification have increasingly emphasized organizational and industrial factors that affect life chances. The "new structuralists" have relied largely on "dual" or "segmented" economy perspectives drawn from institutional and Marxist economics. These theories claim that the U.S. economy is dominated by a small group of corporate Goliaths who command staggering resources. Certain firms and industries, it is argued, continue to dominate the economy, constituting its center or core, while others remain isolated at the periphery.

These economic divisions are believed to affect labor market outcomes because firms in each sector face different constraints on managerial behavior. Many dualists argue that large

firms are insulated from competitive pressures, allowing management considerable freedom in structuring work and employment (Averitt, 1968; Galbraith, 1973). Technical efficiency and market forces may govern work arrangements and reward structures in the competitive periphery, where workers and firms are largely alike. Among center firms, however, hierarchical controls, such as internal career ladders and the proliferation of administrative job titles, are purportedly used. While the labor force of any center firm is admittedly diverse, the average level of skill is hypothesized to be higher among the privileged workers employed in core firms, which use sophisticated technologies, than in the periphery. Higher wages are paid in the core in response to these skills, and hierarchical work arrangements promote upward mobility, reducing the likelihood of turnover by workers who are costly to train. Marxists claim that this organization of work also makes workers easier to control by dividing and conquering them (Goldberg, 1980). The assumption of a parallelism between the dualism of firms and of labor markets, however, has been increasingly questioned (Hodson and Kaufman, 1982).

In short, empirical research in this tradition typically incorporates three assumptions or hypotheses: (1) two or more distinct economic sectors are posited to exist in the U. S. economic structure; (2) these sectors are delineated *industrially*; and (3) these industrial sectors vary not only with respect to market structure, but also in their work arrangements,

employment patterns, and opportunity structures. Recent research has called these assumptions into question on at least two counts. First, industry-level variables presumed to index sectoral distinctions do not cohere neatly (Kaufman et al., 1981; Wallace and Kalleberg, 1981; Hodson and Kaufman, 1982). Second, taxonomies of industrial segmentation do not consistently account for differences in work arrangements and attainment patterns (Baron and Bielby, 1980; Zucker and Rosenstein, 1981; Jacobs, 1983; Cohen and Pfeffer, 1984). The utility of segmentation perspectives has been hotly debated, but we believe that debate has been premature. Most empirical "tests" of these perspectives have been misspecified because the *organizational* content of segmentation has been overlooked. In our view, the principal message of dual economy theory has been ignored: that organizational forms and environments cohere, yielding groups of enterprises with distinctive structures of work and opportunity.

This paper attempts to remedy that limitation of previous research by directly examining each of the three assumptions cited above. The body of contradictory evidence about industry effects on attainment suggests it is unlikely that all three of these hypotheses are true, but there may be greater support for a segmentation perspective when firms are examined. Therefore, we examine the utility of an organizational formulation of segmentation, recasting Averitt's (1968) portrait of economic dualism in terms of the congruence between organizational forms and environments.

We formalize the concept of segmentation and suggest how to measure it below, but one good example is often worth a thousand formalisms. The following two accounts illustrate the organizational differences that segmentation perspectives seek to capture.[1]

> Like many smaller companies engaged in the manufacture of Mexican foods, this is a family business. The owners, husband and wife, handle plant and business management and their son handles sales and shares management responsibility. The distribution of tortillas is a highly competitive enterprise and the unit price of the product is extremely low; as a result, even a small company must deal in considerable volume to prosper . . . [Moreover,] a number of factors, but especially weather conditions, influence activity in this industry . . . Advancement opportu-

nity is extremely limited here; . . . the one possible promotional job, that of foreman, has not been open in some time. However, the picture is brighter for entry level applicants, since almost all positions can be filled by persons without training, specific skills, or educational qualifications. (Narrative report #1650, tortilla company, 1969)

> By the early 1950's, [management saw the need for diversification, including space and weapons technology] . . . Most space and weapon systems are too large and complex to be built by a single company. Because of this many firms must work together . . . To manage the over-all program and coordinate the efforts of the team of companies, the government names one large, capable firm as a central management organization. XXX is this kind of over-all organization, a weapon systems manager, one of several in the country. The work of XXX is coordinated with that of many other companies so that all parts of this system come together— compatibly and on time. [The company] also carries on basic research, not only to support current system management programs, but to create new ones by keeping abreast of world science and weapon technology. The company tries constantly to integrate product conception, development, and manufacture . . . Among problems facing management . . . is how to find skilled people for demanding jobs. One good solution is to train people already employed, which XXX does. If an employee wants additional formal education, the company will pay half the tuition for approved job-related courses . . . XXX [also] offers excellent benefits to employees . . . (Narrative report #413, aerospace company, 1959)

Our goal, of course, is to be analytical rather than anecdotal. The following sections identify and operationalize key dimensions underlying economic segmentation. We then examine whether distinct economic sectors exist and, if so, whether they exhibit different work arrangements and labor market structures.

AN ORGANIZATIONAL PERSPECTIVE ON ECONOMIC SEGMENTATION

Averitt's *The Dual Economy* (1968) is among the most influential road maps to American economic structure. Accordingly, we briefly review it here as an exemplar of this line of institutionalist thought. Averitt overlays two dimensions of segmentation: organizational form and industrial hierarchy. He notes an empirical tendency for large center firms to be clustered in key, manufacturing industries,

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[1] These accounts are from narrative reports written by government analysts studying work arrangements for the U.S. Employment Service (see Baron, 1982: Ch. 2).

while small periphery establishments abound in more competitive, marginal industries. However, Averitt clearly regards organizational scale and structure as the crucial aspect of economic segmentation: "it is economic size, not industrial location, that defines firms in the center economy" (1968:66). Relative to periphery firms, center organizations are larger, more complex, differentiated, technically sophisticated, diversified, concerned with long-range goals, varied in their skill mix, reliant on management (versus technology) in dictating internal arrangements, globally oriented, and less restricted in obtaining financing and other crucial resources.

Averitt (1968:38–43) presents a related discussion of hierarchy among industries, focusing primarily (but not exclusively) on key versus marginal industries within manufacturing.[2] Key industries furnish some measure of market power to their incumbents, helping them dominate their environments. These industries diffuse technological innovations, produce capital stock for industrial production, have input or output linkages with other industries, fuel economic growth, dominate research and development, influence wage negotiations in other industries, and can potentially bottleneck employment expansion. Yet in applying Averitt's ideas to studies of segmentation, especially in relation to income inequality, many analysts have overlooked the question of whether industries are relevant units of analysis in the first place. In Averitt's formulation, "industry" only serves as a convenient shorthand to summarize behavior across organizations. Indeed, industries typically reflect product distinctions, and, as Averitt notes, large center firms are increasingly diversified industrially. Thus, at least among core firms, industries may become less relevant units of economic activity.

The empirical correspondence between key industries and center firms reflects a convergence between organizations' environments and their internal forms, which is also a primary focus of open-systems perspectives on complex organizations. Population ecologists, for instance, typically define *organization* in terms of three characteristics: goals; activity systems (technologies and structures); and boundaries (Hannan and Freeman, 1977:935; Aldrich, 1979:4–6). An organizational *form*, according to this perspective, is the specific constellation of goals, activity systems, and boundary definitions that emerges in response

to the resource constraints imposed by the organization's environment. According to the ecologists' law of requisite variety, organizations confronting complex environments are favored when they adapt through internal complexity (Thompson, 1967; Ashby, 1968).

Averitt thus distinguishes center from periphery in terms of the very same criteria by which ecologists delineate organizational forms. Key industries are the most complex organizational environments and accordingly are composed of firms that are most internally complex. Averitt differentiates center from periphery firms in terms of organizational goals and strategies, procedures for structuring work, and definitions of economic, political, and normative boundaries, the same criteria ecologists use to demarcate forms. He also offers specific hypotheses about how these dimensions cohere empirically—for example, in linking technology to organizational strategy and structure—that are compatible with orthodox approaches to complex organizations (see Scott, 1981). By stressing the relationship between organizational forms and environmental constraints (though not in such terms), Averitt joins with population ecologists in cautioning against simplistic approaches to organizational structure. Accordingly, efforts to describe segmentation that ignore the organization–environment link are likely to err in accounting for specific facets of work organization, and even more likely to fail in predicting organizational responses to change.

In short, recast in organizational terms, Averitt views segmentation as involving the relationship between two dimensions: an internal one, concerning the complexity of organizational forms; and an external one, pertaining to market power or environmental dominance. Key industries, by this construction, exhibit what network analysts term *centrality*, that is, crucial locations within exchange networks. Segmentation theory suggests that larger, more dominant organizations populate key segments of the economy, while smaller, more vulnerable ones occupy its margins.

Organizations thus acquire opportunities to control uncertainty in two interrelated ways: by being situated in strategic and central niches that facilitate proactive maneuvers; and/or by possessing the scale, structure, and technology that make such tactics feasible and necessary. Indeed, the two ways of reducing uncertainty are complementary. We attach the labels of *classical core* and *classical periphery* to situations in which these bases of control correspond closely. Compare the tortillaria to the aerospace enterprise described above. Not only does a simple dichotomy between organizational forms discriminate between them, but

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[2] Numerous empirical applications of Averitt's perspective have divided industries into center versus periphery. However, Averitt clearly regards the dichotomy as having meaning only within industrial niches (1968:66–72, 155–72).

the establishments can also be differentiated in terms of the vulnerability implicit in their respective environments. The aerospace enterprise occupies a strategic position within a network of other dominant firms and thus has opportunities for coordinating with other organizations and helping to shape its economic and political environment. The fact that it is so large and technically complex makes it both necessary and possible to reduce uncertainty in those ways.

Various theoretical perspectives offer explanations for the association between internal organizational complexity and environmental dominance. As noted above, organizational ecologists argue that natural selection favors the retention of forms best suited to their resource environments, and firms become internally complex in response to the complexity of their environments. Edwards (1979:83) exemplifies Marxist notions about industrial concentration and centralization in asserting "that the categories of 'large firm-competitive industry' and 'small firm-monopoly industry' are in fact transitional situations." Stinchcombe (1965) provides another argument for the congruence of forms and environments: organizational forms (structures and technologies) reflect the historical conditions that prevailed in the environment when an industry first emerged. Consequently, variations in modernity across industrial environments should be reflected in the complexity of organizations in each industry.

Finally, institutionalization perspectives provide yet another account of why forms and environments cohere, namely, that firms within a particular niche become isomorphic in how they are organized (e.g., Meyer and Rowan, 1977; DiMaggio and Powell, 1983). Organizations confronting the same environmental constraints develop similar technical and structural arrangements, not necessarily because this reflects the most rational means of organizing, but rather because following prescribed organizational models ensures legitimacy from constituents. Political and legal coercion, imitative responses to uncertainty, and the spread of professionalization result in common organizational responses to environmental dilemmas. Indeed, powerful, older, and larger organizations often seek to transform their environments around their existing goals, structures, and technical activities (Pfeffer and Salancik, 1977; Freeman, 1982).

The fact that so many theoretical explanations exist for the coherence between environments and organizational forms may indicate why segmentation perspectives are so popular, but it also emphasizes that the approaches are more descriptive than explanatory. This paper does not attempt to reconcile or test among these different accounts of environment–form isomorphism; doing so would require historical studies of how firms and environments evolve and how structures, technologies, and work arrangements diffuse across enterprises. Rather, our aim is to provide a more meaningful appraisal of segmentation approaches to stratification than previous industry-based specifications. We do so by first examining empirically whether the hypothesized congruence between organizational forms and environments obtains, yielding distinct sectors of economic activity. Even if dualism or segmentation provides an accurate description of the organizational world, however, it need not prove useful in understanding stratification and work. Consequently, we then examine whether our representation captures sectoral differences in work arrangements and labor market structures that have often been posited but infrequently demonstrated.

It should be noted that while our scheme represents center (periphery) in terms of the presence (absence) of environmental dominance and complex organizational forms, it also allows for departures from such a caricature. Small periphery satellites that produce for large center firms may achieve some market power because interdependence is always to some extent reciprocal: the center firm may need satellites as much as they need it. Here, decreased vulnerability implies little difference in organizational form. Some small high-technology manufacturers and construction firms, for instance, might also occupy this location. They often dominate their environments, which are complex and interdependent, but without internal organizational complexity. On the other hand, some huge, bureaucratic, and technically interdependent organizations operate in settings furnishing little protection against the market—for example, many local hospitals, newspapers, and hotels. Indeed, recent deregulation of certain highly concentrated industries, such as airlines and telecommunications, has left old bureaucratic forms intact, while sharply curtailing opportunities for exercising organizational control through market power and interorganizational relations.

Consequently, it may be dangerous to try to capture so many complex interrelationships with two simple continua. Efforts to reduce organizational structure to a single dimension, such as "bureaucratization," have often been disappointing (see Hall, 1963), as is true of recent attempts to dimensionalize industrial structure (see Kaufman et al., 1981; Wallace

and Kalleberg, 1981). Furthermore, population ecologists emphasize the diversity of organizational species and would view center and periphery as overly stylized ideal types (McKelvey and Aldrich, 1983). Nonetheless, ranking organizations on internal complexity not only simplifies matters, but also corresponds to earlier theoretical and empirical practice (Stinchcombe, 1959; Blauner, 1964; Woodward, 1965; Perrow, 1967; Thompson, 1967). Similarly, numerous analysts have characterized organizational environments along a dimension resembling market power or dominance (Dill, 1958; Emery and Trist, 1965; Thompson, 1967; Duncan, 1972; Benson, 1975).

Moreover, our representation has the virtue of being falsifiable and of reflecting segmentation's *organizational* bases. It implies several specific empirical predictions. Large, unionized, multiproduct, differentiated, and technically sophisticated establishments are presumed to possess greater internal resources and capacity, thus diminishing their vulnerability, while organizations at the other end of the spectrum are expected to be more susceptible to the dictates of their environments. Thus, these attributes should cohere, forming an underlying dimension that captures the range of organizational forms. Similarly, environments are presumed to vary in terms of how much market power they afford incumbents, ranging from complex, global milieux, where firms exhibit dominance and interdependence, to situations resembling the competitive and atomized markets of economic orthodoxy. The former involve key economic activities, particularly heavy manufacturing, where organizations are expected to command greater market power and to operate within more global and heterogeneous environments.

Segmentation theory, as we have noted, also predicts a strong correspondence between these two dimensions, and dualist formulations imply clearly identifiable groupings of core and periphery organizations at the opposite poles. Most importantly, establishments in each sector are expected to display different work arrangements and stratification regimes.. After describing our data and methods, we report multivariate analyses testing this conceptualization of organizational dualism. We then summarize sectoral differences in work arrangements and mobility structures.

DATA AND METHODS

We analyze data on work arrangements within 415 California establishments studied between 1959 and 1979 by the U.S. Employment Service. These data are used primarily in preparing the *Dictionary of Occupational Titles*; procedures for collecting them are described in U.S. Department of Labor (1972) and Miller et al. (1980). Industrial characteristics, obtained from *County Business Patterns* and *Census* (or *Annual Survey*) *of Manufactures* volumes for California, were ascribed to each enterprise, while suborganizational information (about workers and jobs) was aggregated to characterize each organization.

The Sample

There is no well-defined sampling frame guiding the Employment Service in selecting enterprises to study, but they try to represent the diversity of activities carried out within any industry. Each regional office tends to study industries that are concentrated in its area, so our sample of California establishments includes, for example, firms in agriculture, aerospace, and real estate, but not automobile manufacturing or logging. Our sample accurately represents the composition of establishments *within* industries,[3] but the industries studied do not fully represent economic activities within California. In particular, manufacturing is overrepresented, while several major California industries (apparel and general merchandise retail trade, construction, insurance, and trucking) are inadequately represented. While these data do not characterize a distinct population, they reflect work arrangements across a broad range of industrial and organizational contexts. In our view, they provide invaluable comparative evidence of how organizational and environmental contingencies affect the structuring of work and opportunity.

Our unit of analysis is the establishment: "a single physical location where business is conducted or where services or industrial operations are performed" (U.S. Bureau of the Census, 1980:v).[4] Theories of economic segmentation typically emphasize the behavior of firms, and large core corporations sometimes control thousands of establishments. However, more than 60 percent of our observations *are* firms (independent organizations), about 3 percent are subsidiaries, about a quarter are franchises or production sites within larger entities, and roughly 10 percent are administrative divisions, regions, or branches of larger enter-

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[3] We tried reweighting each observation according to published data on the size distribution of California establishments in its industry the year it was studied. This had virtually no effect on the distribution of organizational attributes within our sample.

[4] To ensure comparability, analyses restricted to the firm's productive component or some other subset of jobs or departments were omitted, since they do not accurately characterize an entire work site.

prises. Furthermore, the relationship between segmentation and work organization is manifested largely at the establishment level. The fate of most workers, especially those who actually produce goods or deliver services, is probably linked more closely to the establishment than to the corporation. Evidence about segmentation among establishments can only understate the balkanization of economic activity and its impact on work arrangements, since larger center corporations that own some core enterprises in our sample would differ even more from small autonomous companies in the periphery.

Operationalization

Employment Service documents were used to measure various facets of organizations, their environments, and work arrangements (see Baron, 1982:48–56). Table 1 presents operationalizations and descriptive statistics for variables representing aspects of organizational forms and environments. Each establishment's environment was characterized by whether the enterprise is linked to a larger organization, the scope of the company's product market,[5] and whether the organization operates in more than one four-digit industry.[6] For each enterprise, we also measured the average size of California establishments in its industry the year it was studied. We assume that organizations are least dominant and most passive vis-a-vis their environment when their coactors are also small. The enterprise's share of employment in its industry in California was used as an indirect measure of market power; enterprises dominating an industry's labor market are likely to control other resources in the environment as well.[7] Drawing on Averitt (1968),

organizations were also classified into major industrial categories representing distinct environments: agriculture; manufacturing, mining, and construction; wholesale and retail trade; services; the state sector; and what Averitt terms "social overhead capital industries" (see Table 1). These industry categories are not entirely exclusive, since a few enterprises operate in more than one sector or belong to both the state and social overhead capital sectors as we have operationalized them (e.g., public hospitals). Table 1 also describes variables used to characterize organizational forms: product diversity;[8] departmentalization;[9] employment size; a dummy indexing the presence of unions or formal bidding arrangements; and scales and dummies describing organizational technology (for details, see Baron, 1982:94–105).

RESULTS

Environmental Dominance

Table 2 reports a principal-axis factor analysis of the variables described in panel A of Table 1 that were used to operationalize an establishment's operative environment. The analysis asks: what underlying factors account for the observed commonalities among these nine indicators?[10] According to Table 2, only one factor is required to account for the common variation among these measures, and the factor loadings indicate that this dimension corresponds closely to our expectations outlined above.[11] High scores on this composite denote

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[5] Narrative reports sometimes indicated that an establishment operated on at least a national level, but were unclear whether the market was also international. Consequently, we collapsed the two categories. Cases lacking data on their product markets were assigned missing values.

[6] For enterprises belonging to more than one industry, it was not possible to weight their involvement in each sphere. Therefore, variables characterizing these establishments' environments are unweighted averages of components pertaining to (up to four) specific industry categories.

[7] In certain cases, industry data were unavailable at the four-digit (SIC) level due to confidentiality restrictions. Thus, an enterprise's share of industry employment might be understated in these cases, since the denominator pertains to a larger industrial aggregate. Descriptive statistics and patterns of covariation differ somewhat depending on how detailed the published industry data ascribed to establishments were. However, these variations do not materially affect our results (see below).

[8] Since product distinctions were difficult to discern from Employment Service documents, we settled for a coarse dichotomy distinguishing enterprises that produce more than one class of good or service from those that do not.

[9] Departmentalization was coded as missing in cases when analysts did not enumerate jobs by departments. For instance, in a few large firms they listed jobs by occupational families.

[10] Squared multiple correlations of each item with the others were used as initial communality estimates. Missing data were deleted listwise in all factor analyses.

[11] The second eigenvalue of the reduced correlation matrix equals .59 before rotation, and the factor is virtually orthogonal to the first one ($r = -.05$) in a two-factor solution. In a principal-axis factor analysis with communalities on the diagonal of the correlation matrix, some eigenvalues will be negative, since the trace of the correlation matrix is less than the number of variables factor analyzed (see Harman, 1976). In Table 2, the eigenvalue associated with the one factor retained accounts for 85.5 percent of the "common variance" (the sum of the communalities), 68.4 percent of the sum of the positive eigenvalues in the reduced correlation matrix, and 29.2 percent of the total covariation among the nine variables.

Table 1. Variable Definitions and Descriptive Statistics

Variables	Definition	N	$\overline{X}$	s.d.[a]	min, max
A. Environments					
Linked to larger organizational entity	Whether establishment is an autonomous firm (1 = no)	415	0.417	—	(0, 1)
Industrial diversity	Whether establishment is in more than one four-digit SIC industry (1 = yes)	415	0.051	—	(0, 1)
Average establishment size in industry	Natural log of average establishment size in industry that year in California	381	3.323	1.078	(.888, 7.359)
Industry employment share	Natural log of establishment's proportion of employment in industry that year in California	326	−4.788	1.941	(−9.378, −.218)
Manufacturing/mining/construction sector	In any manufacturing, mining, or construction industry (1 = yes)	415	0.619	—	(0, 1)
Wholesale/retail trade sector	In any trade industry (1 = yes)	415	0.053	—	(0, 1)
Public sector	Government establishment (1 = yes)	415	0.024	—	(0, 1)
Agricultural sector	In any farming industry (1 = yes)	415	0.036	—	(0, 1)
Service sector	In any business, personal, or domestic service industry (1 = yes)	415	0.123	—	(0, 1)
Social overhead capital sector	In any transportation, communication, finance, insurance, real estate, education, health, cultural or nonprofit industry (1 = yes)	415	0.178	—	(0, 1)
Scope of product market	1 = serves local market (city, county, SMSA); 2 = serves entire state; 3 = serves regional market (e.g., Pacific states); 4 = national or international clientele.	244	2.389	1.408	(1, 4)
B. Forms					
Product diversity	Establishment produces more than one good or service (1 = yes)	415	0.361	—	(0, 1)
Departmentalization	Natural log of number of departmental units	345	1.124	0.972	(.000, 3.584)
Scale	Natural log of employment size	414	3.684	1.487	(.693, 8.965)
Unionization and bidding arrangements	1 = union or formal bidding arrangements covering at least some employees engaged in the enterprise's principal activities	415	0.246	—	(0, 1)
Unit/craft technology	2 = unit or craft technologies exclusively; 1 = unit or craft technologies used in conjunction with other technology; 0 = no unit or craft technology	339	0.168	0.440	(0; 2)
Process technology	2 = continuous process technology; 1 = automated process used in conjunction with other technology; 0 = no automation	339	0.316	0.609	(0, 2)
Small-batch technology	1 = present; 0 = not present	339	0.127	—	(0, 1)
Large-batch technology	1 = present; 0 = not present	339	0.227	—	(0, 1)
Mass production/assembly technology	1 = present; 0 = not present	339	0.086	—	(0, 1)
Service: people/things	1 = present; 0 = not present	339	0.457	—	(0, 1)
Service: data	1 = present; 0 = not present	339	0.206	—	(0, 1)

[a] Standard deviations not shown for binary variables.

Table 2. Principal Axis Factor Analysis of Variables Pertaining to Environmental Dominance (N = 189)[a]

Variable	Loading
Linked to larger organizational entity	.45
Industrial diversity	.27
Log average establishment size in industry	.68
Log establishment employment share in industry	.72
Manufacturing/mining/construction sector	.79
Wholesale/retail trade sector	−.28
Public sector	.06
Social overhead capital sector	−.42
Scope of product market	.70
Eigenvalue	2.63

[a] Prior estimates of communalities are squared multiple correlations.

Table 3. Principal Axis Factor Analysis of Variables Pertaining to Organizational Forms (N = 291)[a]

	Promax Rotated Loading	
Variable	(1)	(2)
Product diversity	.23	−.03
Log departments	.80	.19
Log size	.74	.33
Union or bidding arrangements	.55	.14
Craft technology scale	−.02	−.42
Process technology scale	.53	−.03
Small-batch technology	−.07	−.52
Large-batch technology	.47	−.07
Mass production/assembly line technology	.25	−.08
Service: people or things	−.66	.54
Service: data	−.42	.46
Eigenvalue	2.68	1.13

[a] Prior estimates of communalities are squared multiple correlations. The eigenvalues reported are virtually unchanged after oblique rotation; the correlation between factors is .075.

manufacturing enterprises that command a larger share of employment within their industries, demonstrating at least one basis of market power.[12] These establishments operate in global environments and tend to have larger coactors (i.e., the average enterprise in the industry employs many workers). These organizations also tend to be linked to larger entities and to operate in multiple industrial environments. Not surprisingly, wholesale and retail trade establishments score low on this factor, reflecting their relatively atomized and vulnerable situations. The few state sector enterprises in our sample do not seem particularly distinctive with respect to this dimension, although perhaps a more extensive and representative sample of public organizations would resemble manufacturing more.

Like trade organizations, social overhead capital organizations appear relatively localized and vulnerable to market forces. Again, some reservations are warranted in generalizing from this finding: our sample includes an abundance of small schools, real estate offices, and the like, whereas certain financial institutions, utilities, communication firms, and similar social overhead capital organizations—represented by only a few cases in the sample—may resemble enterprises at the other end of this scale. Supplemental analyses indicated that variables denoting service and agricultural industries also load negatively on this factor, reflecting the competitive environments characteristic of small entrepreneurial firms in those industries. The distinctiveness of agriculture is also re-

flected by variables indicating seasonality of output and employment and nonurban location if those are included in the factor analysis. In sum, a single dimension parsimoniously summarizes hypothesized differences in environmental dominance: it distinguishes global, heterogeneous, central environments, in which firms control uncertainty and exercise discretion, from competitive settings, in which organizational fate is more closely tied to inescapable market forces.

Internal Forms

Table 3 reports results from a comparable factor analysis which examined whether organizational forms—constellations of scale, structure, and technology—can by arrayed along the dimension proposed earlier. Variables described in panel B of Table 1 were used to operationalize organizational forms. Two statistical factors are required to characterize the common variation among the indicators employed. However, the first factor is more important statistically and also corresponds closely to our expectations.[13] High scores on this factor denote large, structurally differentiated establishments. They are more

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[12] Deleting enterprises whose industry data were not available at the four-digit level has no effect on the results.

[13] The first factor explains 51.9 percent of the "common variance" (the sum of the communalities), 46.5 percent of the sum of the positive eigenvalues, and 24.4 percent of the total variance. For the second factor, the corresponding percentages are 21.9 percent, 19.6 percent, and 10.4 percent, respectively. The correlation between factors is .075.

likely to be unionized or have formal bidding arrangements and to rely on large-scale, automated technologies (large batch, mass, and/or process), often to produce multiple products. Thus, consistent with Table 2, organizations scoring high on this composite dimension are likely to be engaged (at least partly) in heavy manufacturing. The second factor in Table 3 differentiates large service bureaucracies from other organizations using craft and small-batch technologies, but is considerably less decisive than the first (statistically). The first factor alone seems adequate to capture variations in organizational forms and is consistent with our formulation of organizational segmentation.

The Contours of Segmentation

To determine whether these dimensions cohere as hypothesized, factor scores were computed for 144 observations having complete data for all variables in Tables 2 and 3.[14] The results of Tables 2 and 3 were also used to allocate scores on the external and internal dimensions to the remaining observations lacking complete data. Certain recurring patterns of missing data were encountered. Among observations having complete data, the external and internal dimensions were regressed on relevant subsets of variables to obtain scoring coefficients. These were used to impute factor scores on each dimension to the remaining cases.[15]

Figure 1 presents a scattergram of the two dimensions, with each factor score expressed in standard deviation units. The scattergram seems generally consistent with our expectations about the relationship between environments and forms. Establishments are concentrated in the regions where both environmental and internal complexity are either present or absent, corresponding to what we have called the center and periphery economies (respectively). The bivariate correlation between these two dimensions of segmentation is .67, underscoring the strength of the form–environment isomorphism proposed by organizational theorists.[16]

Nonetheless, as expected, there are some establishments dispersed throughout the two ambiguous quadrants of Figure 1, or between center and periphery, indicating a diversity of form–environment combinations. In fact, if each observation is reweighted to reflect its industry's share of establishments in California, the correlation between dimensions is lowered slightly (r=.49), since some of the cases displaying low congruence represent numerous establishments in the state. In particular, a number of large trade and social overhead capital organizations in our sample are relatively high on the internal dimension but near the bottom of the external dimension, and they represent a large segment of California's economy. In other words, organizations apparently do adhere generally to a principle of "requisite variety," adopting internal complexity appropriate to complexities outside the firm (Ashby, 1968). But neither an organization's milieu nor its anatomy is destiny with respect to the other.

To verify this interpretation, we cluster analyzed the observations in Figure 1, in search of groupings representing organizational classes. We examined two- and three-cluster solutions to allow for the possibility of a transitional category between center and periphery. Whereas we identified a relatively stable division of enterprises into two groupings (denoted by "C" and "P" in Figure 1), three-cluster solutions were highly unstable.[17] The

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[14] Applying the factor models in Tables 2 and 3 to this subset of 144 observations produces identical results.

[15] On average, these regressions explained 95 percent of the observed variance in the external dimension factor scores and 85 percent on the internal dimension. Stochastic terms were added to each case for which factor scores were estimated, so the error variance was the same as among observations having complete data.

[16] The strong empirical association between the two dimensions of segmentation is also revealed by factor analyzing the two sets of variables in Table 1 simultaneously. In doing so, a dominant first factor

emerges (eigenvalue = 5.17) that captures 44.7 percent of the common variance, 40.6 percent of the sum of the positive eigenvalues, and 24.6 percent of the total variation. The variables that load highly on the factor in Table 2 or the first factor in Table 3 also load highly on this composite and vice versa. A weaker second factor (eigenvalue = 2.00) emerges that is the same as the second factor in Table 3 and is virtually orthogonal to the first (r = −.10). Consequently, the first factor in this analysis can be viewed as a principal component plotted through Figure 1, capturing environment-form congruence. The existence of this second factor suggests that some large nonmanufacturing organizations are in the lower, right quadrant of Figure 1, with little market power, while some small-scale manufacturing enterprises lack internal complexity but display environmental dominance.

[17] We used "FASTCLUS" (SAS Institute Inc., 1982:433–47). This algorithm groups observations so distances among cases within clusters are smaller than distances between members of different clusters. It processes observations sequentially, forming provisional cluster centers, and determines the most appropriate cluster assignment for each case. Cluster centers are then recomputed and the next observation processed. Consequently, if distinct clusters do not really exist, results can vary depending on the order in which observations were processed, particularly if one of the first cases encountered is an outlier. Therefore, random sortings of the observations in
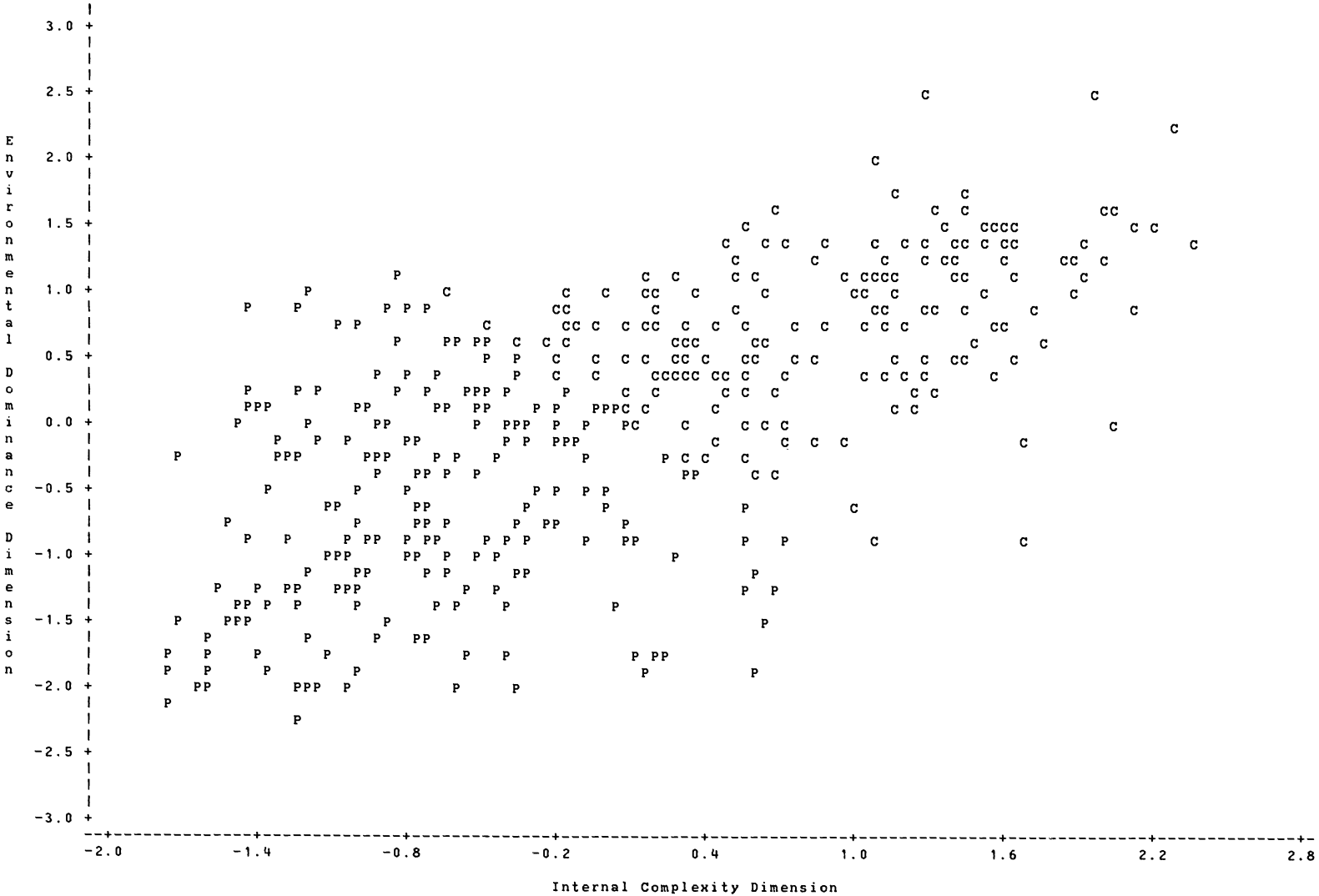
Figure 1. Scattergram Showing Core and Periphery Clusters within Space Defined by Environmental Dominance and Internal Complexity Dimensions[a]

[a] 50 observations hidden.

Environmental Dominance Dimension

Internal Complexity Dimension

greatest instability in the cluster analysis oc-
curred at the boundary between center and
periphery, suggesting that it is easier empiri-
cally to identify the most central and periperal
establishments than it is to determine a precise
boundary between sectors.

There has recently been considerable debate
about whether economic segmentation should
be conceived and measured in terms of discrete
sectors or continuous dimensions (Tolbert et
al., 1980; Kaufman et al., 1981; Wallace and
Kalleberg, 1981; Hodson and Kaufman, 1982).
Figure 1 and the two-cluster solution suggest
there is some validity to both approaches. On
the one hand, while a precise boundary be-
tween sectors is difficult to locate, there is a
fairly clear division between those organi-
zations below the mean on both dimensions
and those enterprises above the mean on both.
A simple sectoral dichotomy based on the
clusters depicted in Figure 1 captures 64 per-
cent and 52 percent of the variance on the
internal and external dimensions, respectively.
The notion of an organizational center and pe-
riphery has some empirical validity as well as
heuristic value.

There are also some clear and predictable
industrial differences in enterprises' locations
within Figure 1. Few periphery enterprises are
engaged in manufacturing, while most core
establishments are. The periphery contains a
disproportionate share of agricultural estab-
lishments; domestic, business, and consumer
services; real estate offices; small educational
institutions; and membership organizations.
The center includes enterprises in oil and gas,
mining, and the majority of those in paper,
fabricated metal products, electronic equip-
ment, and scientific and measuring apparatus.
Establishments in apparel, stone and glass,
miscellaneous (typically small-scale) man-
ufacturing, water transportation, and eating
and drinking tended to be closest to the bound-
ary between clusters.

However, most detailed industries were repre-
sented by enterprises in both sectors, underscor-
ing the limitations of trying to demarcate eco-
nomic segments strictly along industrial lines. For
example: a tiny coffee shop, compared to a
restaurant that is part of a unionized hotel em-
ploying several thousand workers; a boat-

building company that employs six to twelve
workers (depending on demand), versus a U.S.
Naval Shipyard employing over 7800 work-
ers; a new women's bank with 16 employees,
versus a division of several thousand people
within a massive international banking corpo-
ration. Moreover, as noted above, Figure 1
demonstrates a diversity of form-environment
combinations within discrete sectors. For in-
stance, the upper left and lower right portions
of the figure reveal organizations quite high on
one dimension of segmentation but relatively
low on the other.

In short, our results cast doubt on the utility
of conceiving of business activity as clearly
divided between center and periphery econ-
omies, especially at the industrial level. To
be sure, the organizational (and industrial)
differences between the tortillaria and aero-
space plant we described earlier would be re-
flected in virtually any sectoral taxonomy. In
our scheme, the tortillaria would be located
toward the lower left of Figure 1, along with
myriad real estate offices, small service firms,
driving schools, and the like. In contrast, the
aerospace plant would be almost three stan-
dard deviations above the mean on the envi-
ronmental dominance dimension and roughly
3.25 standard deviations above average on the
internal complexity factor. As Figure 1 shows,
however, most organizations are intermediate
between these sectoral extremes, and there is
no clear dividing point between center and pe-
riphery economies.[18] Economist Richard
Caves has made the same point more
eloquently:

> The gleaming glass and metal home of Union
> Carbide Corporation on New York's Park
> Avenue enfolds one kind of business impor-
> tant in the American economy; the elderly
> gentleman standing before it, selling roasted
> chestnuts from his puschcart, typifies an-
> other. Between the Davids and Goliaths of
> American private enterprise lie five million
> incredibly diverse individual business units.
> (quoted in Mason, 1976:23)

Reducing the diversity of organizational
form-environment combinations to overly
stylized ideal types therefore seems likely to
obscure more than it informs. Rather, con-
straints on work arrangements and opportunity
structures can be represented more faithfully in
terms of organizations' locations along the
factor-analytic dimensions discussed above

Figure 1 were also cluster analyzed. In the two-clus-
ter solution, sectoral assignments remained stable
for more than 97 percent of the cases; only the sec-
toral location of a few cases near the grand mean on
both dimensions varied across replications. In the
three-cluster specification, the "periphery" re-
mained stable across replications; however, the
boundary between the "core" and the intermediate
group fluctuated considerably.

[18] Of course, rescaling the factor scores plotted in
Figure 1 could affect the clustering results. How-
ever, we fail to see how any linear transformation of
the scores plotted in the figure would yield discrete
sectors.

rather than their discrete sectoral member-
ship.[19] Therefore, in the next section, which
analyzes the link between segmentation and
work organization, we focus on the continuous
measures of sectoral location.

Segmentation, Work and Opportunity

Sectoral perspectives hypothesize that dif-
ferences in forms and environments affect how
work and opportunity are organized across
segments. The sophisticated technologies and
complex structures of core firms, for instance,
supposedly increase their reliance on firm-
specific skills and bureaucratic controls, in-
cluding an internal labor market. Large center
bureaucracies are posited to have higher levels
and wider ranges of skill, more capital-inten-
sive production, more differentiated work ar-
rangements, a smaller percentage of minority
workers, and greater opportunities for internal
advancement through job ladders (see Baron
and Bielby, 1980). Table 4 summarizes some
evidence regarding these hypothesized dif-
ferences. The table shows relationships be-
tween various organizational attributes—
occupational composition, technology and skill
distributions, division of labor, gender com-
position, and labor market structure—and
sectoral location.[20] The table compares the ex-
planatory power of our organization-level
scheme against a continuous industry-level
version proposed by Tolbert et al. (1980),[21] as
well as the major industrial groups described in
Table 1.

Columns 2–4 of the table report regression
coefficients from models predicting each orga-
nizational variable from the environmental
dominance and internal complexity factors.[22]
The table also reports (in parentheses) zero-
order correlations between each work organi-
zation variable and the two dimensions of seg-
mentation. The fifth through seventh columns
report coefficients of determination (adjusted
for degrees of freedom) for each organizational
variable based on our typology and the indus-
trial-sector schemes.

The two organizational dimensions of seg-
mentation display significant and consistent
relationships with attributes hypothesized by
Marxists and institutionalists to differ across
sectors. Within our sample, the tendency for
large manufacturing establishments to domi-
nate the economic core is demonstrated by the
fact that enterprises that are high on both di-
mensions contain higher percentages of pro-
duction workers, rather than administrative,
service, or other support personnel. Not sur-
prisingly, core enterprises in manufacturing are
also in industries exhibiting higher capital in-
tensiveness and productivity.[23] According to
Table 4, those enterprises are also slightly
more labor intensive. However, our meas-
ure—the natural log of the ratio between
production payrolls and the value of shipments
in the industry—may reflect higher levels of
pay for production workers in the manufac-
turing industries where our core enterprises are
located, rather than greater reliance on labor
per se.

As expected, center enterprises (that is,
those high in both dimensions) hire more man-
ually skilled labor, but also a more balanced
mix, involving tasks at all levels of complex-
ity.[24] Indeed, the typical center establishment
is more diverse with respect to all types of skill
and training, while periphery enterprises have
more homogeneous workforces. However,
workers outside the core do not lack training or
skills. On average, informational and interper-

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[19] That is, analyses relating segmentation to work
organization (summarized below) yielded much
stronger relationships based on the two continuous
dimensions than on any organizational dichotomy.

[20] If observations are reweighted to represent their
industry's share of enterprises in the California
economy, enormous weights are attached to a few
very small nonmanufacturing establishments (at the
bottom of Figure 1), each of which represents thou-
sands of similar enterprises in the state (e.g., real
estate offices, restaurants, and hospitals). Conse-
quently, reweighting has the effect of essentially
limiting statistical analyses to small nonmanufactur-
ing organizations, thereby changing the pattern of
relationships reported in Table 4. Segmentation
theories, however, concern variation across the en-
tire spectrum of organizations in the economy, not
within this set of tiny enterprises. Accordingly, we
report the unweighted results, which characterize a
wide range of employment settings, rather than leave
the (false) impression of having accurately repre-
sented the population of California work organi-
zations.

[21] This continuous measure was consistently re-
lated to the work organization variables in Table 4
more strongly than the dichotomous industrial tax-
onomy of Beck et al. (1978).

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[22] Intercepts are reported only for variables mea-
sured in a percentage metric; all other variables are
measured in standard deviation units.

[23] The former variable is measured by the natural
log of industrial capital expenditures per production
worker. The latter variable is defined as value added
(in dollars) per production hour worked, also
transformed into a log metric. Both refer to an estab-
lishment's industry in California during the period of
study by the Employment Service.

[24] The level and dispersion of manual, informa-
tional, and interpersonal skills are measured by the
mean and standard deviation of workers' involve-
ments with things, data, and people (respectively),
based on procedures developed by the U.S. Em-
ployment Service (see Baron, 1982: Ch. 5).

Table 4. Models of Sectoral Variation in Work Organization

Variable[b]	N (1)	Intercept (2)	External Dimension (3)	Internal Dimension (4)	Variance Explained[a] By			
					External & Internal Dimensions (5)	Tolbert et al. Continuum[c] (6)	Major Industry Categories[d] (7)	Organizational Variables[e] (8)
Occupational Composition								
Percent professional, technical, managerial workers	391	.16	−.03 (−.26)	−.03 (−.26)	.08	.00[n]	.30	.11 (.22)
Percent clerical and sales workers	391	.20	−.06 (−.29)	−.01[n] (−.23)	.08	.01	.18	.22 (.04)
Percent production workers	392	.56	.18 (.56)	−.00[n] (.37)	.31	.17	.57	.51 (.11)
Percent service workers	391	.07	−.09 (−.32)	.04 (−.09[n])	.12	.31	.37	.19 (.10)
Technology and Skills								
Industrial capital intensity[f]	202	—	.25 (.37)	.20 (.35)	.16	.43	—	— (.45)
Industrial labor intensity[f]	194	—	.02[n] (−.14[n])	−.25 (−.24)	.05	.07	—	— (.57)
Industrial productivity[f]	214	—	.17 (.34)	.28 (.39)	.16	.31	—	— (.50)
Manual skills: level	392	—	.23 (.22)	−.01[n] (.14)	.05	.03	.08	.21 (.25)
Manual skills: dispersion	392	—	.14 (.37)	.35 (.44)	.20	.05	.11	.25 (.20)
Informational skills: level	349	—	−.23 (−.26)	−.04[n] (−.19)	.06	.00[n]	.28	.22 (.20)
Informational skills: dispersion	349	—	.28 (.46)	.28 (.46)	.25	.06	.25	.27 (.15)
Interpersonal skills: level	349	—	−.33 (−.42)	−.14 (−.36)	.18	.01	.27	.21 (.05)
Interpersonal skills: dispersion	349	—	.15 (.16)	.01[a] (.11)	.02	.08	.08	.08 (.10)
Specific vocational preparation: level	315	—	−.06[n] (−.22)	−.24 (−.28)	.08	.01[n]	.23	.38 (.47)
Specific vocational preparation: dispersion	315	—	.13[n] (.22)	.14 (.23)	.05	.01[n]	.03	.05 (.01[n])
Division of labor								
Number of unique job titles (log)	408	—	−.01[n] (.53)	.81 (.80)	.63	.07	.08	.87 (.89)
Positional specialization[g]	381	—	−.12 (.18)	.48 (.39)	.16	.00[n]	.01[n]	.59 (.62)
Distributive differentiation	381	—	.12[n] (−.17)	−.45 (−.36)	.14	.00[n]	.01[n]	.54 (.55)
Fragmentation/proliferation of job titles	372	—	−.19 (.10)	.44 (.31)	.11	.00[n]	.04	.30 (.39)
Gender Composition								
Percent women workers	388	.33	−.02[n] (−.17)	−.04 (−.21)	.04	.06	.03	.09 (.12)
Labor Market Structure[h]								
Percent of all jobs on bottom of organization	99	.63	−.02[n] (−.21)	−.05 (−.23)	.04	.11	.05	.30
Percent of all jobs that are entry portals	99	.80	−.03[n] (−.32)	−.06 (−.36)	.12	.11	.07	.32
Percent of all jobs in a promotion ladder	99	.63	.05[n] (.26)	.05[n] (.26)	.06	.14	.08	.21
Percent of all jobs with future mobility prospects	99	.60	.02[n] (.33)	.10 (.40)	.15	.13	.13	.30
Length of promotion ladder for average job (log)	99	—	.07[n] (.30)	.30 (.36)	.11	.13	.10	.27

[a] Adjusted for degrees of freedom.

[b] All dependent variables are standardized, except those in a percentage metric (for which intercepts are reported). Coefficients for external and internal dimensions are standardized, with zero-order correlations between each dimension and dependent variables shown in parentheses.

[c] See Tolbert et al. (1980). Enterprises producing in multiple industries were assigned a score equaling the unweighted average of the factor indices for the industries in which they produce. Domestic service enterprises in our sample were assigned the factor score for "other personal services."

[d] See Table 1 for a description of industry categories.

[e] Model predicting work organization from variables in Table 1 (except occupational and industry variables). See text for explanation. Coefficients of determination for manufacturing only shown in parentheses.

[f] Manufacturing enterprises only.

[g] Low values correspond to a specialized division of labor.

[h] The variable measuring market scope is omitted in models for these outcomes, due to missing data. Results are not reported separately for manufacturing, due to the small sample size in these analyses.

[n] $p > .05$ (two-tailed test); otherwise, $p \leq .05$. However, for analyses of the labor market structure outcomes (based on small samples), the "n" superscript signifies $p > .10$.

sonal tasks are significantly more complex in the smaller organizations of the periphery, where professional and kindred workers comprise a larger share of the workforce. Those workers also typically possess educational credentials representing general human capital. Consequently, average vocational training (measured by the mean of workers' "specific vocational preparation") is higher in the periphery. Within the core, in contrast, experi-

ence typically accumulates as workers progress among successively more demanding jobs, producing a more fine-grained (highly dispersed) distribution of training and skills.

Neo-Marxists argue that core bureaucracies proliferate job titles, fragmenting work and differentiating tasks to divide and conquer workers. This logic of bureaucratic control supposedly coopts employees by creating opportunities for advancement through career

ladders that result from a detailed and hierarchical division of labor. Table 4 reports some evidence consistent with that characterization. Not surprisingly, large core bureaucracies have many more detailed job titles. They also proliferate administrative job titles relative to actual tasks, based on our fragmentation index. It measures, in a logarithmic metric, the ratio of job titles used by the firm to the number of distinct (six-digit) occupational tasks identified by the government expert who studied each enterprise.

Table 4 reports relationships between sectoral location and two other dimensions of the division of labor. We measured "positional specialization" as the size of the job category in which the median worker was employed, transformed logarithmically. For instance, in an organization having 10 jobs staffed by one worker each, 5 jobs staffed by two persons each, a job with 3 incumbents, one with 7 incumbents, and another with 15, our measure of specialization equals the natural log of 3.0.[25] Obviously, only large enterprises can have massified job classifications that would tilt this measure toward high values. (Note that low values on the index signify *more* specialization, since a highly specialized organization would have most of its workers in job classifications with few incumbents.) Consequently, larger organizations tend to be less specialized, according to this measure. Controlling for our internal complexity dimension (which includes size), however, Table 4 shows that environmental dominance does tend to be associated with a more specialized division of labor, as expected.

In addition to the proliferation of functions or jobs, organizational analysts regard an even distribution of effort across roles as indicating a highly developed division of labor. For each enterprise, we computed a measure of "distributive differentiation," that is, the evenness of the distribution of people across job classifications (see Gibbs and Poston, 1975).[26] Like the specialization measure, this organi-

zational attribute is strongly constrained by size; smaller enterprises tend to have a more even division of labor according to this index, since none of their job classifications employs a large number of people. Thus, the results for differentiation are the mirror image of those for specialization: larger center enterprises tend to be less evenly differentiated, but, controlling for their size, the environmental dominance associated with core membership is associated with a more even division of labor, as hypothesized.[27]

Small periphery organizations rely on a slightly larger *proportion* of female workers. However, the vast majority of women covered by our sample of establishments were employed outside the periphery as we have defined it, even after reweighting establishments to reflect their employment shares in California (cf. Bridges, 1980; Hodson and Kaufman, 1982: 734). As expected, many small marginal organizations tend to exclude women altogether or concentrate them within routine clerical positions. Other peripheral establishments hire men and women within certain occupations, such as real estate sales, that conform to human capital notions about entry and exit costs: skills do not decay quickly from disuse, and rewards are sufficient to attract males as well as females. In contrast, large core firms tend to segregate men from women even within detailed job classifications. Institutionalized personnel practices (e.g., formal bidding arrangements), positional specialization, the proliferation of job titles, and reliance on skilled manual labor all typify the manufacturing core, and each, in turn, fosters gender segregation (see Bielby and Baron, forthcoming).

The final set of variables examined in Table 4 characterizes the labor market structure of each enterprise, allowing us to assess the relationship between economic segmentation and organizational mobility. For a subsample of the enterprises analyzed above, we reconstructed promotion ladders based on information contained in job analyses and narrative reports.[28]

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[25] That is, there are 10 workers in jobs of size one, 10 workers in jobs of size two, and 3 workers in the job of size three, equalling 23, which is the median value in this hypothetical organization employing 45 people.

[26] The formula is $1 - \dfrac{\left(\sum\limits_{i=1}^{N} |x_i - \bar{x}|\right)}{2N\bar{x}}$, where x_i is the number of workers in the ith position, N is the number of organizational positions, and $\bar{x}$ is the average number of workers per position. The measure is not affected by the sheer number of job titles, which is correlated .92 with size in our sample when both variables are measured logarithmically.

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[27] The effect of the dominance dimension on distributive differentiation is significant at the .03 level, based on a one-tailed test.

[28] This subsample did not differ significantly from the sample as a whole, except that these observations had more extensive coverage of promotion information: on average, promotion information was available for virtually all line jobs and workers in these establishments, as well as for 67 percent of the jobs and 75 percent of the workers overall in each enterprise. Regression models for the labor market variables controlled for the percentage of jobs covered in each organization.

For each establishment, we measured the percentage of all jobs on the bottom organizational level and the proportion of all jobs that are entry portals (at the bottom level or otherwise); the larger these percentages are, the less likely an organization is to resemble the ideal-typical "vacancy chain," with entry restricted to the bottom of the ladder. We also measured the percentage of jobs in promotion ladders, the percentage of jobs with upward mobility prospects (i.e., not "dead end" jobs), and the length of the promotion ladder for the average job in the organization (in a log metric).[29] High values on these outcomes are assumed to represent organizations with well-developed internal labor markets.

Table 4 indicates that these variables are associated with our sectoral dimensions as expected, although there is no net effect of environmental dominance on labor market structure once internal complexity is statistically controlled.[30] Firms that dominate their environments or which are internally complex are more "top-heavy," more closed off to external entrants, and have more of their jobs in career ladders. These results provide some evidence of an association between organizational segmentation and labor market segmentation, although the link is weak. The relationships between labor market structure and the industry-based sectoral schemes in Table 4 suggest that differences in industrial market power are also related to organizational mobility chances.

Another major implication of Table 4 is that our organization-level scheme typically accounts for differences in how work is organized better than industry taxonomies that have been popular in the segmentation literature, though there are exceptions to this pattern.[31] Not surprisingly, our organizational dichotomy and dimensions are less strongly related to industry-level attributes of manufacturing (capitalization, labor intensiveness, and productivity) than is the industrial typology of Tolbert et al. (1980), which explicitly incorpo-

rates those variables. For several aspects of labor market structure, their market power continuum also captures more variation in the data. This reflects the strong inverse relationship between scores on that continuum and being located in the service, agricultural, or trade sectors. On all of the dimensions of labor market structure, enterprises in trade, service, and agricultural industries are least likely to manifest internal labor markets.

Only two other variables in Table 4 exhibit substantially stronger associations with their industry sectoral scheme than with our organizational dimensions: the percentage of personal and business service workers and the dispersion of interpersonal skills. Again, these variables concern the distinctiveness of service and trade industries. Service and trade organizations employ a larger percentage of service employees. They also typically have a more homogeneous distribution of interpersonal skills, since: (a) firms are smaller and therefore have narrower authority hierarchies; and (b) clients are the major focus of activities, so most workers have relatively complex interpersonal tasks, compared to other industries. Because our specification of segmentation is not rigidly circumscribed by industry categories, it does not reflect these distinctive attributes of service and trade enterprises as faithfully. On the other hand, our specification is more sensitive to organizational differences in technology, skills, and the division of labor.

Table 4 also demonstrates that some dimensions of work organization vary much more within major industry categories than others, underscoring the danger of assuming that industry is always an appropriate basis for delineating organizational forms. Attributes relating to the technical organization of production (occupational mix and skill levels) do vary substantially across major industry categories. Thus, there is some justification for claiming that industrial categories reflect technical arrangements typically used to produce a commodity or service. However, less than 24 percent of the variance in our internal dimension is captured by the broad industry categories, highlighting the diversity of organizational forms within industrial niches. Furthermore, several key variables in Table 4 seem to be related more strongly to our organizational dimensions than to industrial location. For example, the degree of homogeneity or heterogeneity among manual skills in an organization varies considerably within industry groups. Differences in gender composition and the division of labor are also not captured by industrial categories or the market power continuum, whereas our internal dimension—

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[29] The results are unchanged if these measures are computed over workers rather than jobs.

[30] Because of the smaller sample size in these analyses, the superscript "n" indicates $p > .10$ (two-tailed test); otherwise, $p \leq .10$.

[31] To be sure, the industry sectoral schemes capture some of the same variation as our organizational dimensions do. However, they are more strongly associated with our environmental dominance dimension, which is based in part on industrial location, than they are with internal organizational forms. For instance, the external and internal dimensions correlate .63 and .41, respectively, with the Tolbert market power continuum.

reflecting scale, structure, technology, and formal bargaining agreements—is significantly related to those outcomes. If industry schemes faithfully reflected differences in organizational forms, then the major industry categories should have also accounted for variation in those outcomes.

These aspects of work organization that vary so much within industrial sectors are likely to be particularly important for stratification. For instance, the proliferation of specialized job titles, gradients of firm-specific skills, and a predominance of male workers are typically associated with higher wages and the existence of internal labor markets (Doeringer and Piore, 1971), and they affect the criteria used to match workers, jobs, and wages (e.g., Stolzenberg, 1978). All of these variables are strongly related to organizational size. This may explain why analyses of industry effects on attainment have yielded limited returns and why size bears such a strong relationship to labor market outcomes (Baron, 1984).

The fact that some aspects of work organization vary more across major industry categories than across our organizational dimensions might be viewed as evidence demonstrating the propriety of industry-level analyses of attainment, which we have criticized elsewhere (Baron and Bielby, 1980). Stinchcombe (1979), for instance, classified industries along a craft–bureaucracy continuum in terms of their characteristic labor market dynamics, demonstrating systematic differences in mobility patterns and wage attainment across those industrial sectors. He suggests (in personal communication) that such a taxonomy would show stronger relationships to work organization and attainment than the coarse industrial categories in Table 4. We agree. In our view, however, this proposal seeks to salvage industry-level analyses by imbuing industrial taxonomies with organizational content. We believe a more productive approach is to examine the organizational factors that affect work arrangements and labor market structure directly.

In fact, given that our analyses above failed to uncover the existence of discrete sectors, perhaps notions of segmentation, whether organizational or industrial, discrete or continuous, should be abandoned altogether. Greater insight into work arrangements and stratification processes may be gained by studying how specific facets of an organization's form and environment affect the way work and rewards are structured. By assuming that different sources of complexity and dominance push organizations in the same direction in organizing work and opportunity, segmentation

taxonomies (even our organizational one) obscure reality.[32] For example, some firms or industries may maintain dominance through technical superiority and entry barriers, passing on higher wages to employees. Other firms may use that dominance to keep wages at or below market rates, for instance, by threatening to transplant production overseas (Bridges, personal communication).

The final column in Table 4 provides some evidence of how much information is lost in the process of imposing segmentation frameworks on the organizational world. It reports the explanatory power of models predicting work arrangements from the variables in Table 1 that we originally used to characterize organizational forms and environments, except for industry.[33] (Results for manufacturing enterprises are reported in parentheses.) The coefficients of determination in the final column of the table (adjusted to degrees of freedom) are much higher here compared to those reported for the other segmentation schemes, even our organizational dimensions. Moreover, supplemental analyses revealed that the variation in skills and labor market structure across major industry categories documented in Table 4 is due almost entirely to organizational and occupational differences among industries. Controlling for the latter, there are only trivial net differences in work organization and labor market structure across major industry groups. For instance, if variables describing the occupational mix of each enterprise are added to the model reported in column eight of Table 4, our ability to predict the mix of skills improves substantially. Major industry categories, however, capture little that is unique about work arrangements apart from these differences in

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[32] Similarly, Kalleberg et al. (1981) have shown that the effects of industrial structure on stratification outcomes are far from systematic. Different facets of "market power" affect different outcomes, and the effects vary by sex.

[33] The model adds a binary variable denoting multilocational enterprises and a quadratic term for log size, but omits the departmentalization and industrial employment share variables, which are highly collinear with size. The categories of small- and large-batch technology were combined, and the service technology variables were omitted to guard against multicollinearity. Craft and process technologies were each measured by two dummy variables—one denoting exclusive use of the technology, and the other indicating its use in conjunction with another technology. The technology measures used in this analysis differed slightly from those in Table 1 since a few manufacturing enterprises were recoded after detailed reanalyses of their workflow processes. These later recodes did not affect, however, the factor analysis results reported in Table 3.

occupational and organizational charac-teristics.

Away from a Theory of Segmentation: An Example

In ongoing work, we have not only abandoned the notion of discrete sectors, but of segmen-tation altogether. Rather, we are developing and testing hypotheses from diverse organi-zational perspectives regarding variation in work arrangements and labor market structures across enterprises (see Baron and Bielby, 1984a, 1984b; Baron et al., 1984). The advantages of doing so are illustrated by con-sidering the fragmentation variable discussed above.[34] Marxists view "bureaucratic control" as a concomitant of economic dominance and core-sector membership. They argue that "[core] employers probably find it increasingly useful to create constantly and perpetually differentiated job categories—if for no other reason—in order to provide new and relatively compelling fodder for the fetishistic craving [of workers for status]" (Gordon, 1972:77).

Regression analyses of our fragmentation measure provide some evidence consistent with this hypothesis, but they also suggest that not every aspect of environmental dominance and internal complexity works in the same di-rection of favoring more fragmented work. Not surprisingly, size is the strongest determinant of fragmentation: a 10 percent increase in em-ployment implies an increase of about 1.2 per-cent in the ratio of job titles to work roles among all enterprises, and an increase of roughly 1.47 percent within manufacturing.[35] There is also a positive effect of market scope on fragmentation. As predicted by open-systems perspectives on organizations, one way to compartmentalize a complex environ-ment is by segmenting and labelling boundary-spanning jobs in terms of their specific sub-environments, such as Cost Accountant versus Tax Accountant (Dill, 1958; Ashby, 1968). As expected, such differentiations are utilized most in professional, technical, and managerial work, whereas clerical and sales jobs are sig-nificantly less likely to be subdivided in this way.

In contrast, organizations in industries with large enterprises are significantly *less* frag-mented, even though having large coactors is supposedly one of the characteristics of core location. A small part of this effect is mediated by industry; enterprises in our sample that are in industries with large coactors are dispropor-tionately in manufacturing, where work is less fragmented than in other industrial sectors, particularly in comparison to the public sector. State organizations often adopt highly bureau-cratic control systems because this enhances their legitimacy in the eyes of constituents (Meyer and Rowan, 1977) and because spe-cialized job titles serve as "hedonic wages" in the public sector, where civil service regu-lations tightly regulate compensation. How-ever, there is also a modest (and significant) negative net effect of having large coactors on the tendency to proliferate job titles. DiMaggio and Powell (1983) have developed hypotheses about when structural arrangements are most likely to diffuse and become isomorphic across organizations, and it seems reasonable that environments composed predominantly of large actors would exhibit greater tendencies toward isomorphism. In this context, we ob-serve one manifestation of that isomorphism: use of a shared lexicon of job titles that meshes closely with those developed by the Employ-ment Service.[36]

In short, not every characteristic associated with environmental dominance or internal complexity has the same effect in shaping work arrangements. These results underscore the fact that organizational reality, as usual, is greyer than our theories about it. Based on the regressions summarized in Table 4, if there is any single "imperative" shaping the organiza-tion of work, it is that of size. Segmentation accounts are therefore correct in claiming that work and opportunity are organized differently in very large enterprises than in very small ones. However, there are many reasons this could be so, and our findings with regard to fragmentation indicate that some empirical evidence can be marshalled in support of any of several diverse theoretical accounts of why large firms proliferate job titles. In our opinion, students of inequality will learn more by specifying and studying how particular aspects of environments and organizations impinge on work and opportunity than by embracing coarse typologies that are merely descriptive and, based on our results, not very descriptive at that.

SUMMARY AND CONCLUSIONS

Recent attempts to "test" segmentation per-spectives have been misspecified, overlooking

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[34] Detailed analyses of this aspect of the division of labor are reported in Baron and Bielby (1984b).

[35] The standardized effect is .60 for all enterprises and .71 for manufacturing.

[36] Networks of large organizations are also more likely to rely on professional experts of all sorts, including job analysts who have catalogued their firm's roles using procedures similar to those of the Employment Service.

the organizational content of those perspectives. This paper has demonstrated the utility of conceiving and measuring segmentation in organizational terms. Our analyses show that work arrangements and labor market structures are indeed related to environmental dominance and organizational complexity. However, there is little evidence of discrete sectors of economic activity, particularly along industrial lines.[37] While organizational forms and environments exhibit the hypothesized isomorphism, there are no immutable laws at work. Rather, organizations with a specific structure, technology, and scale occupy diverse niches, and varied organizational types populate the same environment.

We believe the formulation of segmentation presented here has several advantages over previous industrial schemes. The dimensions we have used to characterize organizational milieux and forms parsimoniously summarize differences posited by segmentation perspectives. These dimensions, in turn, are significantly related to various aspects of work organization and opportunity. No doubt our results show more consistent relationships between segmentation and work arrangements than

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[37] Unfortunately, we did not learn of Hodson's (1984) recent analysis, which examines many of the same issues as this paper, until our manuscript had already gone to press. In general, his results, based on a sample of Wisconsin high school graduates with company and industry data merged to individual records, seem quite similar to ours, which we find encouraging. For instance, size appears to be the most important organizational characteristic affecting labor market outcomes. He also finds, as we did, that there is substantial heterogeneity of organizational arrangements within industrial sectors, and that specific facets of organizational and industrial structure that are usually associated with monopoly power do not all affect labor market outcomes in the same way or identically across gender groups. These results bolster our confidence in the conclusions we have drawn from our own organization-level analyses. Hodson argues that "there is no *ultimately correct* level at which economic segmentation must be operationalized (cf. Baron and Bielby, 1980)" (1984:346, emphasis in original). We agree. This paper has merely sought to conceptualize and measure the determinants and consequences of segmentation at the organizational level. These organizational bases and effects of segmentation have been emphasized by researchers in the past, including those studying segmentation at the industrial level, but they have rarely been examined empirically. If the existence of segmentation (and its consequences) is to be *tested*, rather than merely assumed, then the type of conceptualization and measurement effort reported here is essential. Of course, the fact that we found limited evidence of organizational dualism need not imply that other forms of segmentation are irrelevant.

previous research because our specification is not based exclusively on industry membership. Our approach also provides a way of conceptualizing and measuring paths of sectoral mobility. Our results did not reveal a pronounced division between organizational segments; a considerable number of enterprises occupied ambiguous sectoral locations, perhaps in transit to or from the center economy. However, if some small firms persist over time alongside giants within key industries, or, conversely, some very large firms fail to dominate their niches, there may be cause to reevaluate policies claiming that bigness is inevitably either a virtue or liability.

At the same time, we have illustrated the limits of trying to reduce the diversity of organizations and work arrangements to a small number of ideal-typical categories or dimensions. There was empirical support for our formulation of segmentation and for most of our hypotheses about how work arrangements vary across sectors. However, the case of fragmentation illustrated that the attributes of an organization and its environment supposedly associated with core membership do not necessarily all affect work arrangements similarly. The organizational world simply appears far more complex than dual or segmented economy approaches imply.

It is possible that we have understated the evidence that supports dualism in the economy and its bearing on work arrangements. For instance, we acknowledge the relativity of our sectoral scheme. In absolute terms, some enterprises classified here as "core" might not warrant inclusion in the same sector as, for instance, a huge steel company or banking corporation. The sectoral classification employed here simply summarizes conspicuous differences among establishments *in our sample*. Studies extending our conceptualization to corporations (rather than establishments) might unearth even more striking sectoral differences in work and opportunity than this paper did. Sectoral differences would presumably be greater if characteristics of massive core corporations were juxtaposed against attributes of small periphery firms, and the number of ambiguous or intermediate cases might also be reduced considerably. However, we have argued that most organizations are situated somewhere between the extremes of segmentation's "periphery" and "core," resembling each to some degree. While tortillarias and aerospace manufacturers, the two examples from our sample, may approximate those extremes quite well, most people work in organizations that are not so easily pigeonholed.

The empirical analyses reported here by no

means resolve debates about whether a dual economy exists, but they do document how stratification among organizations—in terms of internal complexity and environmental dominance—is a key source of stratification among workers. Consequently, researchers should turn their attention to the interdependence of organizational and individual fates. Those interested in work and inequality need to examine not only the organizational and environmental attributes that differentiate tortillarias from aerospace plants, but also those that distinguish one tortillaria from another. These include size, structure, founding conditions, technology, control systems, market situations, normative and regulatory environments, locale, and demographic mix. There is a wealth of organizational theory suggesting how these attributes might affect life chances (Baron, 1984). Cumulative progress in stratification research will require developing and testing that body of theory.

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