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Industrial Restructuring in the US Economy: A Value Analysis

As an alternative to macro-social theories of economic restructuring, the authors provide a framework for theorising restructuring at the industry level. They analyse the uneven development and restructuring of US manufacturing industries between 1958 and 1982, using Marxian value analysis to associate restructuring with changing levels of exploitation.

● In recent years several researchers have attempted to associate crises in US capitalism with major structural changes in the US economy and the institutions within and around it. Most prominently, the French regulation school (e.g. Aglietta, 1979; DeVroey, 1984; Lipietz, 1986) and an American group including Bowles, Edwards, Gordon and Reich (see, for example, Gordon, *et al.,* 1982) have theorised structural change within US capitalism in terms of successive 'regimes of accumulation' or 'social structures of accumulation' (SSAs) which develop, flourish and finally crumble during periods of critical upheaval.

These theories of economic and social transition touch on many of the processes associated with the concept of 'industrial restructuring' including changes in the labour process and in industrial organisation, but they are ultimately concerned with the macro-process of economic regulation. Their goal is to delineate phases of development within capitalist social formations—particularly the US—and analyse structural transition at the level of the national economy and society as a whole.

This paper, by contrast, aims to present an analysis of structural change at the level of the industry. Compared to that of the regulation and SSA schools, the analysis is less focused on the identification of hegemonic regimes and more on the dynamics of particular industries as they contribute unevenly to phases of economic and social development. We thus offer a narrower, but more detailed, perspective on capitalist development than that provided by the regulationists and SSA theorists. In addition, this study attempts to theorise restructuring within the framework of Marx's labour theory of value. We recognise that value theory has come under widespread attack (e.g. Steedman, 1977; Roemer, 1988), but we believe that most attacks are based on an essentialist reading of Marx's theory as a theory of price determination (see Wolff, *et al.*, 1984, and Amariglio and Callari, 1989, for different readings). From our perspective, values provide an alternative metric to market prices, highlighting the capitalist class process of appropriating and distributing surplus labour that goes on simultaneously with price formation (Roberts, 1987).[1] Rather than attempting to explain prices in a reductive and mechanical fashion, value categories offer a quantitative language for the analysis of capitalist exploitation.

In the following discussion, we first put forward a framework for conceptualising restructuring at the industry level. This involves specifying structural variants of capitalism. We then report on an empirical analysis of structural transition in US manufacturing sectors between the years 1958 and 1982, chosen for reasons of data availability and comparability. Using value magnitudes calculated from input-output and labour force data, we associate structural change at the industry level with movements in sectoral rates of surplus value, organic compositions of capital, and value rates of profit. Finally, we offer an interpretation of the association between structural transition and changes in value magnitudes which attempts to avoid the determinism characteristic of many versions of Marxian value and crisis theory.

Capitalist Variants and Industrial Restructuring

Capitalist industries are the sites of a wide variety of social processes. Most important for this study is the fundamental capitalist class process of exploitation which involves the production and appropriation of surplus labour in value form.[2]

This process is complexly constituted by relations occurring within and outside the industrial sector. Most directly, the production and appropriation of surplus value is affected by the nature of *technology* and the *labour process* in a particular industrial setting. Exploitation is also influenced by those not directly employed, and especially by the *reserve army of labour* within the wider labour market.

At the industry level other processes create specific conditions for the maintenance of exploitation in production. The *centralisation* of capital ownership affects the scale and capitalisation of production, influencing patterns of surplus value production and distribution within and between firms. The *internationalisation* of different forms of capital likewise creates important preconditions for surplus value appropriation.

Many other social processes also determine class relations in capitalist industries. Racism, sexism, or government intervention, for example, might be just as important in constituting exploitation within a particular sector as the processes mentioned above. In this paper we have limited our analysis to the conditions of exploitation listed in *Table 1.*

These five conditions of exploitation can be used to define distinctive variants of capitalist production. A variant is characterised by a set of historically specific conditions of exploitation that stabilise in an industry over a period of decades. In our work we have identified three variants (each named for a salient feature) that have arisen over the history of capitalist industry in the US. In the *competitive variant* neither

Table 1
Capitalist Variants

Condition of Exploitation	Capitalist Variant		
	Competitive	**Monopoly**	**Global**
Technology	Machinofacture	Semi-automation/ mass-production	Full automation/ robotics
Labour process	Modern industry	Fordism/scientific management	Neo-Fordism
Reserve army	Unemployed labour	Segmented labour	Peripheralised labour
Centralisation	Regional horizontal	National horizontal and vertical	Global horizontal vertical and diversified
Internationalisation of circuits of capital	Commodity capital	Money capital	Productive capital

labour nor capital benefits from monopoly power in the marketplace and capitalist exploitation is locally organised in a dispersed and fragmentary fashion. In the *monopoly variant* a segment of the work force occupies a monopoly over 'good jobs' in a national labour market and capitalist exploitation is structured by labour segmentation and strong national and regional cleavages. In the *global variant* capitalist exploitation is integrated at the international scale, minimising regional and national barriers to surplus value appropriation. These three stylised models of capitalist industry are summarised in *Table 1.*

While production and competition in any industry may be organised by a number of different variants, and a variety of contradictory characteristics may coexist within an industry dominated by a single variant, we are assuming that at any one time a particular variant is hegemonic. Industrial restructuring involves a reshaping of hegemony as an established and dominant variant is challenged by new conditions and social processes affecting exploitation. In the process of transition, an industry may experience a range of contradictory movements before a new combination of conditions establishes its dominance.

If we view the economy as an aggregation of industries connected by physical input-output relations, ownership networks and competitive market dynamics, it is also possible to consider a particular variant of capitalist production as hegemonic in the economy as a whole. The dominance of one variant of production in a number of different industries may produce an influential coalescence of social processes which from hindsight can be viewed as a stage of capitalist development. In the discussion that follows, we briefly trace the historical development of the competitive, monopoly and global variants. Though we see them as coexisting, these variants of capitalism have emerged unevenly and each has possessed in the course of its history the potential to define the economic character of an era.

In the early days of capitalist industrialisation the competitive variant involved the subsumption of craft or independent labour to industrial technologies and the emergence of the collective worker (Marx, 1977). Then as now, exploitation within the competitive variant was fostered by the existence of a surplus labouring population that put

pressure on workers to undercut established subsistence wages, subsidising capital in the attempt to gain or retain employment (see, for example, Keyssar, 1986). In the initial period of capitalist dominance and in countless subsequent instances of market penetration into traditional economies, the retrenchment of labour from non-capitalist sites of productive employment such as the rural household, cottage industry and artisan's shop thrust large populations onto the capitalist labour market (Laurie, 1989). Throughout the history of capitalist industrialisation, mechanisation has continued to replenish the surplus labouring population.

Historically, the competitive variant has been associated with limited centralisation of ownership and firms that operate in a narrow geographical compass (Aglietta, 1979). While this decentralised ownership structure was often mirrored in the commercial and financial fractions of capital in the early days of the industrial revolution, in subsequent periods the competitive variant of production has been seen to coexist with highly centralised ownership in retail and money markets. The local organisation of production is not inconsistent with an internationalised circuit of commodity capital and in many historical and contemporary instances competitive commodities are explicitly produced for a world market.

The hegemony of a competitive variant of capitalist production was challenged around the turn of the century when the concentration and centralisation of capital led to a major growth in fixed capital and industrial agglomeration, and to a more militant working class (Harvey, 1982). In the face of growing output levels, subsistence wages placed limits on effective demand and the basis of competitive exploitation was transformed into an obstacle to profit making. At the same time, unions began to regulate the pressure exerted by a surplus labouring population via wage setting procedures, erection of entry barriers to the labour market for certain jobs, and political agitation for greater public responsibility for the welfare of the unemployed (Aglietta, 1979). Aspects of a new variant in the making offered resolutions to the limits of the competitive variant by combining major innovations in mass production technology, scientific management of the capitalist labour process, and segmentation of the labour force (Gordon, *et al.*, 1982).

A crucial condition for changes in the operation of national labour markets was the increased centralisation of capital ownership and the formation of vertically and horizontally integrated enterprises with substantial power in national markets (Markusen, 1985). Yet during the period of unparalleled national dominance of the monopoly variant, company ownership displayed a distinctive international dimension. Direct foreign investment was focused upon the establishment of 'cloned' branch plants (Massey, 1984) which operated in host national markets very much as the parent companies did at home. Meanwhile, the competitive variant of production was by no means eliminated but continued to dominate certain industrial sectors and survived in others in a subordinate market position (e.g. Graham, 1992).

In the heyday of monopoly capitalism, institutionalised relations between capital and labour often permitted viable capitalist production to coexist with intense labour militancy (Clark, 1989). More recently, however, an emergent global variant of production has ushered in new forms of competition and exploitation that radically undermine the position of monopoly capital. New technologies and labour processes involving automation, computerisation and robotics offer the potential for greater flexibility to both high and low volume producers, resolving problems of rigidity and over-capacity associated with mass production (Piore and Sabel, 1984). Smaller and more disintegrated institutional structures assume greater viability *vis-à-vis* large vertically integrated firms (Scott, 1988). The centralisation of capital ownership continues, but as the mobility of capital investment accelerates on a global scale, rapid changes in 'ownership' are associated with unpredictable and devastating consequences at the level of production.

The international mobility of productive investment and the accompanying global integration of national economies have become important conditions of exploitation within the global variant of production (Bluestone and Harrison, 1982). An expanding range of spatial, technical and institutional options has freed capital from reliance upon a dedicated labour force. New labour, unencumbered by unions, is being tapped in greenfield sites in the developing and developed worlds (Howes, 1992). In established industrial regions 'primary' labour is seeing working conditions erode and is forced to relinquish its monopoly hold on certain labour markets.

Global capitalism has coalesced in certain sectors to such a degree that the monopoly variant has been eliminated or subordinated. In other sectors the challenge of a global variant is still being met, and in yet others such a variant may never emerge. In this paper we propose to explore the extent to which these three variants were present in the US manufacturing sectors in 1982 and to examine the transitions between variants that took place over the interval 1958-1982.

Industrial Restructuring and Marxian Value Theory

Marx (1981b, p.263) notes that different 'spheres' or 'branches' of production are characterised by different organic compositions of capital, turnover times, and rates of surplus value.[3] Building upon this conception of the disaggregated economy, we examine the connections between restructuring, defined as transition between capitalist variants at the level of the individual sector,[4] and exploitation, defined as the production and appropriation of surplus labour in value form. In order to assess changes in exploitation, we use certain categories of Marxian value theory.

These categories have been integral to theories of capitalist development since the origins of the Marxian tradition. Perhaps the best known example derives from Marx, who theorised capitalist development as a process involving contradictory movements in value ratios. As capital accumulates economy-wide, the organic composition of capital advanced, Q, and the rate of surplus value, s', show a tendency to rise. Reference to the identity

$$r = (1/t)\,(s'/(1+Q)) \qquad (1)$$

indicates that if turnover time, t, is constant,[5] the rate of profit, r, depends on the relative dominance of the rises in Q and s'. Though Marx specifies a range of countertendencies that render the direction of change in the rate of profit indeterminate, his formulation in Volume III of *Capital* presents the tendency in Q as dominant; thus the profit rate has a tendency to fall. Some later Marxists have claimed that this set of dynamics lies behind the major restructuring episodes that have punctuated the history of capitalist development (e.g. Mandel, 1975).

Our approach diverges from this formulation in a number of key respects. We do not accept the theory of the formation of a general rate of profit, since we reject both the behavioral assumptions underlying this concept and the associated conception of value theory as a theory of price determination. As a consequence, we treat the profit rate in question as the aggregate value rate of profit. This category is an index of the production of surplus labour—in value form—taking place in the capitalist economy as a whole.

Our primary focus, however, is capitalist industry and movements in value ratios on the sectoral level. It is our hypothesis that industrial restructuring in manufacturing is associated with changes in sectoral Q and s' and resulting changes in r. The sectoral transition from competitive to monopoly capitalism, for example, historically involved such developments as the introduction of mass production and assembly line techniques as well as 'scientifically managed' labour processes. As these developments became generalised throughout a sector, they would very likely be associated with a rising sectoral organic composition and with productivity increases that engendered a rising rate of surplus value.

A sectoral transition from the monopoly to the global variant involving the introduction of automated labour processes through computerisation and robotics and the undermining of unions through increased capital mobility might well be accompanied by a simultaneous rise in the sectoral rate of surplus value and organic composition of capital. Conversely, episodes of industrial decline involving transition from the monopoly to the competitive variant would appear to involve devalorisation of fixed capital and a weakening of labour's bargaining strength. We would expect these developments to be associated with lower sectoral organic compositions and increased rates of surplus value. Given these many considerations, movements in organic compositions and rates of surplus value as well as value rates of profit cannot be determined, a priori, but must be the focus of empirical investigation (Cullenberg, 1988).

An Empirical Study of Restructuring and Value Ratios in US Manufacturing Sectors

Data and methods

Investigation of the relationship between restructuring and value ratios involves two distinct operations. The first is the classification of each of 51 manufacturing sectors associated with the 85-order 'input-output' industrial disaggregation into one of three categories—competitive, monopoly, or global—for the years 1958 and 1982. These years were chosen for reasons of data availability and because they both represent troughs in the business cycle.

The second operation involves computing organic compositions of capital, rates of surplus value, turnover times, and value rates of profit for each sector in 1958 and 1982. The bases for these calculations are interindustry transactions tables as well as data on capital stocks and flows, inventories, and the labour force, transformed through the application of the well-known methods of Morishima and Seton (1961).[6]

The calculation of value ratios requires in addition

(1) a computation of commodity values consistent with the definition in Marx's *Capital*, Volume I (1977) excluding unproductive labour;
(2) the disaggregation of values into four major components (fixed constant capital, circulating constant capital, variable capital and surplus value); and
(3) the calculation of capital advanced (the stock form of capital). Given the definitions of r, s', t, and Q above, these operations suffice to generate the necessary ratios.

In recent years the computation of Marxian value ratios has been the object of considerable attention (see, for example, Amsden, 1981; Moseley, 1985; Ochoa, 1984; Wolff, 1987). These writers and others have addressed certain issues not taken up here, such as the possibility of computing rates of surplus value without resort to interindustry data, the merits of abstracting from the skill and intensity of labour, and the inclusion of circulatory and supervisory labour in the calculation of productive labour (Gouverneur, 1990). An overview of recent work is provided in Dunne (1991).

Value Computations

For each of the two years 1958 and 1982, unit values (commodity values per dollar of output), λ, were computed as the solution to the equation

$$\lambda = \lambda' A_f + \lambda' A_m + l' \qquad (2)$$

where λ' is the (row) vector of unit values, l' is a vector of direct productive labour coefficients and A_f and A_m are direct requirements matrices reflecting fixed and circulating constant capital expended per unit output. The vectors of fixed and circulating constant capital expended per unit output were computed as $\lambda' A_f$ and $\lambda' A_m$ respectively.

While the data for A_m was readily available in published form (US Department of Commerce, 1965; 1988a), the construction of A_f from existing data involved an elaborate series of calculations. An interindustry transactions matrix in new structures and equipment[7] was normalised to produce a matrix of investment coefficients reflecting the amount of investment good i in the investment bundle of sector j. This matrix was then multiplied by a vector of replacement investment[8] (US Department of Commerce, 1986) for the appropriate year, yielding a matrix of replacement investment flows. Normalising this matrix by total output, we generated A_f, reflecting the direct requirements of fixed constant capital per unit output. (This latter step is analogous to the normalisation of interindustry transactions tables in the construction of a direct requirements matrix for intermediate inputs).

Prior to the calculation of commodity values it was necessary to excise unproductive sectors (Shaikh, *et al.*, 1985). This process reduced the matrices from 85 to 71 sectors, eliminating trade, finance, insurance, real estate and government, among others.[9]

The vector of direct labour inputs, l', was based on Bureau of Labour Statistics data on hours worked by input-output sector (US Department of Labor, 1979) augmented, for 1982, by data reported in SIC categories (US Department of Labor, 1986) which we transformed into I-O categories using the classification code provided in Ritz, *et al.* (1979). These data were reduced to productive labour inputs using the ratio of production workers to total workers for each of the 71 productive sectors (US Department of Labor, 1986).

In order to calculate value ratios, it was necessary in addition

(1) to disaggregate direct labour into variable capital expended and surplus value and
(2) to compute stocks of constant and variable capital advanced.

Variable capital expended was calculated using the consumption vector from the I-O tables. The valorised magnitude of total consumption (technically, the inner product of the value vector and the consumption vector) was assumed equal to aggregate variable capital plus consumption by capitalists, unproductive workers, and others. In order to compute variable capital by sector (confined to the consumption of productive workers), total valorised consumption was multiplied by the ratio of each sector's production worker earnings (US Department of Labor, 1986) to total dollar consumption.[10] Surplus value was then calculated as the difference between total direct productive labour and variable capital expended.

Flows of circulating constant and variable capital expended were converted into stocks of capital advanced, multiplying each sectoral flow by its respective turnover time. Turnover times were estimated as inventory-output ratios, computed as an annual series from data available in Ritz and Roberts (1973), the Annual Survey of Manufactures, and interindustry transactions tables.

Finally, computation of the stock of fixed constant capital advanced involved multiplying the investment coefficients matrix (see the discussion of Af above) by the vector of net capital stock,[11] yielding an interindustry matrix of capital stocks. Total fixed constant capital advanced by sector is associated with the valorised magnitude of sectoral capital stock (i.e. the inner product of the capital stock matrix and the vector of unit values).

Given these preliminary computations, sectoral rates of surplus value were calculated as the ratio of surplus value to variable capital expended; sectoral organic compositions of capital advanced as the ratio of fixed and circulating constant capital to variable capital advanced; and sectoral value rates of profit as the ratio of surplus value to constant and variable capital advanced.

The Classification of Sectors

In order to classify sectors by variant we employed a series of statistical techniques associated with the method of discriminant analysis. Using the indicator profiles shown in *Table 2* and the variables shown in *Table 3,* we first selected 21 sectors (7 per variant) for which classification was, in our view, unambiguous.[12] The 21 sectors were selected based on the 'match' between our idealised profiles and the corresponding set of variable magnitudes for each sector. This allowed the estimation of three group classification functions[13] which were then used to classify all 51 sectors for 1958 and 1982. A change in classification for a particular sector between the two years was interpreted as evidence of restructuring.

The variables and sources of all data used in performing the discriminant analysis are recorded in *Table 3. Table 4* lists the sectors included in the subset of 21 industries, while *Tables 5* and *6* record the actual profile of indicator means and analyses of variance (ANOVA) validating the hypothesis that the profiles are significantly different from one another. The results of the ANOVA justify our use of the subset as the basis for a general classification procedure.

Table 2
Hypothesised Profiles of Indicator-Variant Relationships

Indicator	Variant		
	Competitive	**Monopoly**	**Global**
Computerisation	Low	Medium or low	High
Unionisation	Low	High	Medium or low
Militancy	Low	High	Medium or low
Sectional centralisation	Low	High	Medium or low
Competing imports	Low	Medium or low	High
Foreign subsidiaries	Low	Medium or low	High
Direct foreign investment	Low	Low	Medium or high

Table 3
Variable Definitions and Sources

Indicator	Variable	Source
Computerisation	Purchases of computers and peripheral data processing equipment.	US Department of Commerce, *Census of Manufactures,* Table 3d.
Unionisation	Distribution of national and international unions by industry and affiliation (per cent).	US Department of Labor, *Handbook of Labor Statistics,* Table 162.
Militancy	Work stoppages involving 1,000 workers or more; per cent of estimated total working time.	US Department of Labor, *Handbook of Labor Statistics,* Table 140.
Centralisation	Per cent of value of shipments accounted for by the four largest companies.	US Department of Commerce. *Census of Manufactures,* Table 5.
Competing imports	Imports of goods produced by US-based sectors.	US Department of Commerce, Bureau of Economic Analysis interindustry transactions tables.
Foreign subsidiaries	Number of countries in which the top four firms in each industry have production facilities.	*Ward's Directory of 49,000 Private US Corporations (1984)* was employed to select the top four firms; *Moody's Industrial Manual* (1958; 1977; 1982) was used to determine production facilities.
Direct foreign investment	Direct investment (in excess of $100M) by foreign countries in US industries.	US Department of Commerce, International Trade Administration (1988c).

Table 4
Unambiguously Classifiable Sectors, by Variant, 1977

Competitive	Monopoly	Global
Textiles	Apparel	Food
Floor coverings	Steel	Printing
Wooden containers	Non-ferrous metals	Chemicals
Household furniture	Metal cans	Drugs
Office furniture	Engines and turbines	Oil refining
Leather	Household appliances	Office machinery
Footwear	Aircraft	Instruments

Table 5
Profile of 1977 Sample Means*, by Variant

Indicator	Variable	Competitive	Monopoly	Global
Computerisation	Purchases of computers and peripheral data processing equipment.	4.514	10.371	56.229
Unionisation	Distribution of national and international unions by industry and affiliation (per cent).	0.403	0.718	0.511
Militancy	Work stoppages involving 1,000 workers or more; per cent of estimated total working time.	0.196	0.516	0.394
Centralisation	Per cent of value of shipments accounted for by the four largest companies.	27.744	51.543	36.857
Competing imports	Imports of goods produced by US-based sectors.	704.143	2873.714	6513.571
Foreign subsidiaries	Number of countries in which the top four firms in each industry have production facilities.	1.643	6.088	22.404
Direct foreign investment	Direct investment (in excess of $100M) by foreign countries in US industries.	0.000	0.000	132.286

* Values shown in *Table 5* indicate means of variables for competitive, monopoly, and global sectors shown in *Table 4*

Table 6
Summary of Statistical Selection Criteria for 1977 Discriminant Analysis Sample

One-way Univariate Analysis of Variance

Indicator	'F' statistic	Probability
Computerisation	3.555	0.050
Unionisation	6.863	0.006
Militancy	2.866	0.083
Centralisation	6.389	0.008
Competing imports	3.430	0.055
Foreign subsidiaries	23.546	0.000
Direct foreign investment	3.975	0.037

Multivariate Analysis of Variance

Hotelling-Lawley Trace[1]	=	16.258
F-statistic	=	12.774
Probability[2]	=	0.000

Notes: 1. See Anderson (1984 p.324)

2. Probability that the difference among profiles shown in Table 5 would have arisen in our sample at random. We observe that this probability is less than 1 in 1,000 which indicates that these differences are, in all likelihood, due to structural rather than purely random factors.

Results and Discussion

Restructuring in Manufacturing Sectors

A schematic representation of restructuring for manufacturing sectors over the interval 1958-1982 is shown in *Figure 1* (see over). The number of transitions of each type is shown in *Table 7*.

Table 7
Summary of Transitions

Transition from:	Transition to: Competitive	Monopoly	Global	1958 Total
Competitive	9	4	3	16
Monopoly	9	11	14	34
Global	0	0	1	1
1982 Total	18	15	18	51

Notes:

McNemar symmetry chi-square	=	19.971
DF	=	4
Probability	=	0.000

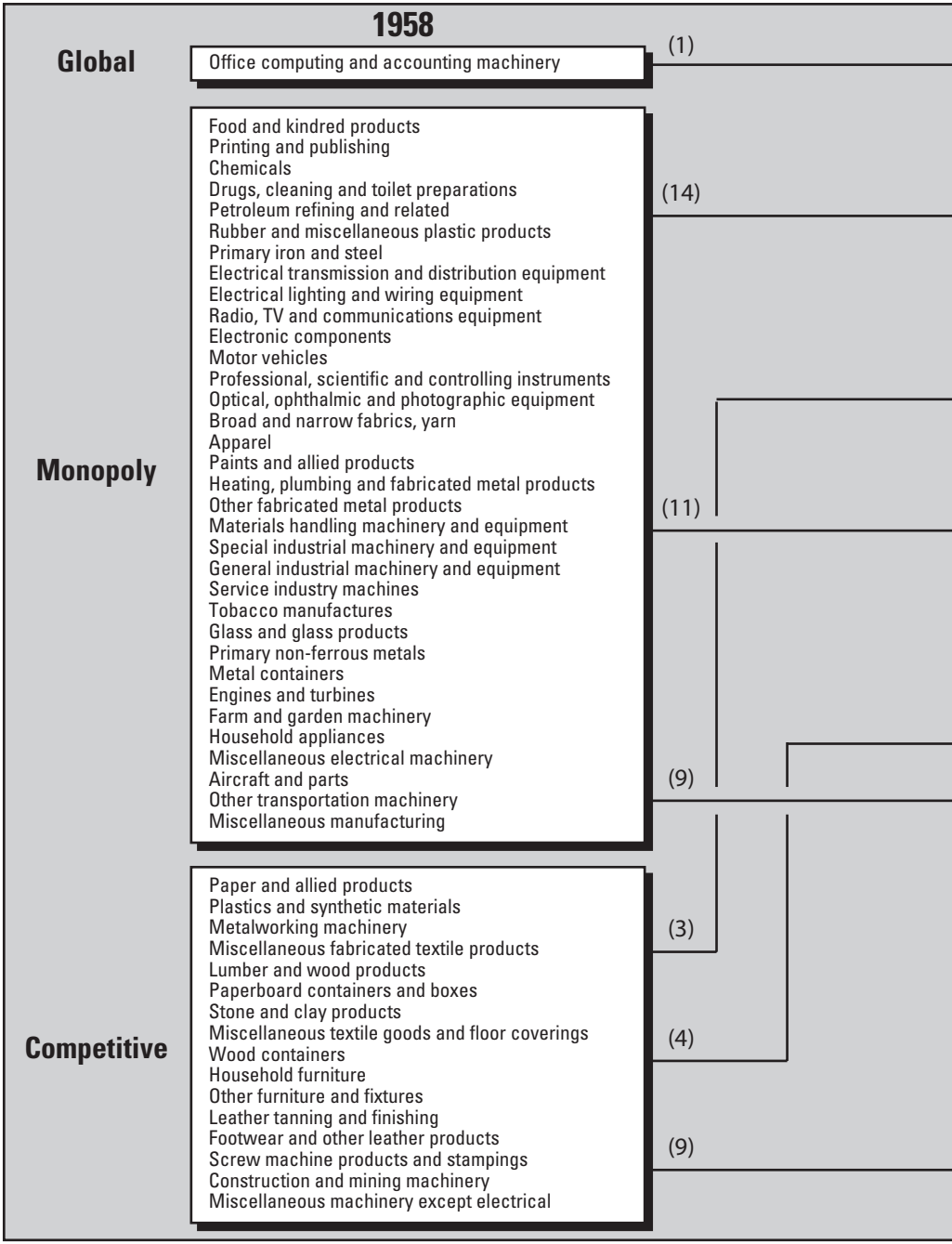
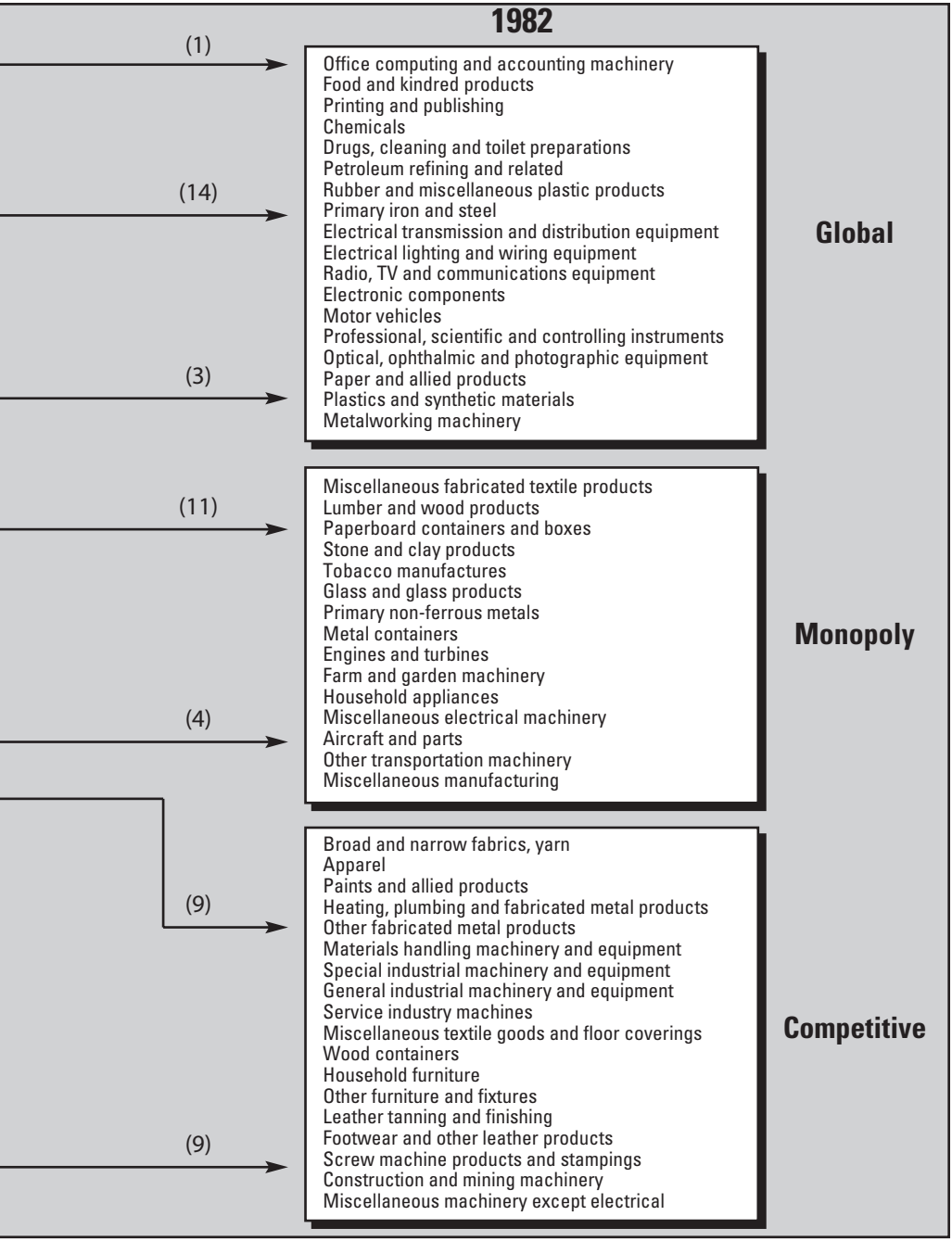


Figure 1. Structural Transitions Between Variants of Capitalist Production in 51 US



Manufacturing Sectors, 1958-82 (85 Order Input-output Industrial Disaggregation)

Transition From----------To	I-O Sector
Monopoly----------Global	Food and kindred products Printing and publishing Chemicals Drugs, cleaning and toilet preparations Petroleum refining and related Rubber and miscellaneous plastic products Primary iron and steel Electrical transmission and distribution equipment Electrical lighting and wiring equipment Radio, TV and communications equipment Electronic components Motor vehicles Professional, scientific and controlling instruments Optical, ophthalmic and photographic equipment
Competitive----------Global	Paper and allied products Plastics and synthetic materials Metalworking machinery and equipment
Competitive----------Monopoly	Miscellaneous fabricated textile products Lumber and wood products Paperboard containers and boxes Stone and clay products
Monopoly----------Competitive	Broad and narrow fabrics, yarn Apparel Paints and allied products Heating, plumbing and fabricated metal products Other fabricated metal products Materials handling machinery and equipment Special industrial machinery and equipment General industrial machinery and equipment Service industry machines
Competitive----------Competitive	Miscellaneous textile goods and floor coverings Wood containers Household furniture Other furniture and fixtures Leather tanning and finishing Footwear and other leather products Screw machine products and stampings Construction and mining machinery Miscellaneous machinery except electrical
Monopoly----------Monopoly	Tobacco manufactures Glass and glass products Primary non-ferrous metals Metal containers Engines and turbines Farm and garden machinery Household appliances Miscellaneous electrical machinery Aircraft and parts Other transportation machinery Miscellaneous manufacturing
Global----------Global	Office computing and accounting machinery

Table 8. s', Q, and R, by Sector

s′		Q		r	
1958	1982	1958	1982	1958	1982
2.795	4.513	57.629	77.776	0.56	0.457
1.957	4.081	26.392	55.736	0.773	0.824
2.215	3.726	73.189	139.701	0.243	0.156
2.215	3.9	40.741	50.176	0.441	0.392
l.697	2.358	175.536	318.816	0.103	0.074
2.362	2.675	20.097	19.537	0.83	0.559
1.789	2.02	29.828	15.98	0.289	0.253
2.346	4.404	12.88	19.168	0.948	0.847
2.718	5.854	15.214	19.097	1.157	0.981
2.229	3.849	13.548	29.076	1.058	0.505
3.113	5.3	11.668	41.308	1.723	0.507
1.887	2.235	24.497	47.106	0.479	0.333
2.424	4.392	10.667	21.14	1.075	0.756
2.424	4.392	10.667	21.14	1.075	0.756
2.506	3.964	54.269	84.531	0.466	0.315
2.201	3.697	74.023	102.35	0.287	0.225
1.887	3.423	17.257	14.706	0.735	0.763
3.908	7.499	137.42	11.873	2.216	2.329
3.113	5.216	53.655	17.756	1.452	0.698
2.756	4.301	27.236	33.959	0.851	0.775
2.473	2.601	27.092	18.616	0.627	0.518
3.941	6.408	23.185	27.316	1.041	0.99
3.781	8.54	6.305	10.335	4.969	2.588
2.44	4.206	27.544	41.854	0.573	0.405
2.187	4.461	11.127	21.783	0.935	0.891
2.272	4.016	13.133	16.919	0.951	0.714
2.106	3.149	10.675	21.141	0.894	0.763
2.346	3.804	9.517	22.279	0.864	0.612
2.16	3.633	13.767	24.622	0.733	0.598
2.346	4.328	20.254	21.88	0.583	0.569
3.331	6.676	23.916	27.805	0.876	0.659
3.908	8.257	22.121	15.727	1.071	1.79
3.356	7.144	10.479	12.378	2.153	1.756
3.136	6.739	11.682	35.615	1.504	1.298
3.719	5.547	11.189	24.258	0.528	1.184
3.719	7.955	9.499	6.965	4.283	2.222
2.201	5.055	16.374	25.399	0.852	0.796
2.106	2.764	10.319	17.957	0.528	0.386
2.243	3.777	8.03	25.503	1.732	0.848
3.63	2.776	26.744	40.383	0.519	0.267
2.473	2.571	16.316	16.530	0.698	0.550
1.789	4.336	28.238	41.834	0.396	0.319
1.91	2.574	16.787	35.732	0.641	0.435
1.843	2.646	15.269	27.363	0.535	0.333
2.173	3.406	15.571	13.233	0.652	0.433
2.229	4.5	18.068	15.516	0.773	0.738
2.362	4.858	11.774	23.33	1.423	0.84
1.945	2.621	7.312	20.219	0.805	0.374
1.933	2.797	13.202	11.739	0.704	0.777
3.113	5.736	5.775	13.339	1.662	0.931
2.068	4.455	9.378	59.201	0.853	0.406

Our results provide evidence for the thesis that the monopoly variant is in decline and that global capitalism is in the ascendant. Four transitions to monopoly capitalism occurred during this period, while 23 instances of restructuring away from monopoly were recorded; 17 cases of transition to global capitalism were noted, while no industries showed restructuring away from the global variant. Chi-square values under the null hypothesis of symmetrical restructuring to and from monopoly capitalism are significant at the 99.9 per cent level. The null hypothesis is thus rejected.

The analysis also indicates that restructuring is unpredictable and occasionally perverse. The usual and expected restructuring pattern proceeds from competitive to monopoly and, ultimately, to global capitalism. Yet in the results reported in *Table 7* and *Figure 1*, nine sectors show transition from a monopoly to a competitive structure. These results suggest that a 'stage theory' of restructuring oversimplifies an historical process that is often roundabout.

Restructuring and Value Ratios

In *Table 8* (above) we record organic compositions advanced, Q, rates of surplus value, s, and rates of profit, r, by sector. Sectors are grouped by their pattern of restructuring.

All manufacturing sectors, with the exception of tobacco, show significant increases in the rate of surplus value over the period 1958-82. 40 of 51 sectors exhibit increases in the organic composition of capital advanced; 45 of 51 sectors reveal declines in the rate of profit.

The profile of sectoral value ratios for 1982, as shown in *Table 9*, differs markedly from variant to variant. For global industries in 1982, organic compositions are higher while value rates of profit are lower than those for monopoly and competitive sectors. The average rate of surplus value for global sectors is also slightly lower than that of monopoly sectors and substantially lower than that of competitive sectors.

A multivariate analysis of variance (MANOVA) for our 1982 sample of 51 manufacturing sectors highlights differences in value ratios between variants. The MANOVA tests the null hypothesis that the profile of value ratio means is the same for competitive, monopoly and global sectors. Results summarised in *Table 10* show significance levels in excess of 99 percent, supporting the claim that variants differ significantly in their value ratio profiles.

Table 9
Means of Sectoral Value Ratios, by Variant, 1958 and 1982

Ratio	Variant	Mean 1958	Mean 1982
Organic composition	Competitive	24.43	22.21
	Monopoly	25.28	22.76
	Global	‡	72.56
Rate of surplus value	Competitive	2.91	5.36
	Monopoly	2.39	3.90
	Global	‡	3.82
Value rate of profit	Competitive	1.26	1.06
	Monopoly	0.91	0.69
	Global	‡	0.49
Turnover time	Competitive	0.17	0.27
	Monopoly	0.17	0.30
	Global	‡	0.22

‡ Insufficient sample

Table 10
Multivariate Analysis of Variance, by Variant, on Value Ratios, 1982

Variable	SS	DF	MS	F	P
Organic composition	19031.148	2	9515.574	4.951	0.011
Error, Organic Composition	92260.854	48	1922.102		
Rate of surplus value	26.427	2	13.213	59.790	0.005
Error, Rate of surplus value	106.075	48	2.210		
Value rate of profit	2.983	2	1.492	6.252	0.004
Error, Value rate of profit	11.452	48	0.239		
Hotelling-Lawley Trace[1] = 0.458					
F-statistic = 3.433					
Probability[2] = 0.004					

Notes: 1. See Anderson (1984 p.323)

2. This describes the probability that the differences in mean value ratios for sectors within given variants arise at random. The probability of 1 in 250 indicates that these differences derive from structural rather than purely random factors.

From our perspective, the identification of a significantly lower average value rate of profit in global sectors as compared to monopoly and competitive sectors is one of the most interesting results of this analysis.[14] The comparatively high organic composition in global sectors suggests that capitalists in those sectors have made massive investments in constant capital. It appears, however, that such investments have not produced an increased capacity to extract surplus value per unit of capital advanced. While global sectors are likely to operate at the cutting edge of modern technology, industrial organisation and labour relations, these may contribute more to the social or market hegemony of global capitalism than to its exploitative potential.

Restructuring to the global variant of capitalist production implies a higher proportion of sectors with low rates of value profitability. There is also an association between low 1958 profitability in competitive and monopoly sectors and restructuring to the global variant. *Table 11* reports aggregate profitability for 1958 within classes of sectors defined by a particular mode of transition over the subsequent 24 years. Regardless of whether transition occurred from the competitive or monopoly variant, high profitability was an indicator of a likely transition to competitive, intermediate profitability an indicator of transition to monopoly, while low profitability appeared to foreshadow a subsequent transition to global capitalism. We note too that seven out of eight sectors with 1958 value profit rates below 0.5 experienced global restructuring by 1982.

Table 11
Mean Profit Rates for Sectors Classified by Type of Transition, 1958 (1982)

Transition from:	Transition to: Competitive	Monopoly	Global
Competitive	1.28 (0.92)	0.98 (0.72)	0.47 (0.35)
Monopoly	1.38 (1.06)	0.73 (0.51)	0.47 (0.38)
Global			0.85 (0.41)‡

Notes: ‡ only one observation in this class

The strong statistical association between low levels of value profitability in 1958 and the subsequent transition to global capitalism over the period 1958-82 should not necessarily be construed as evidence of a causal relationship between depressed or declining profitability (as cause) and restructuring (as effect).[15] A low sectoral level of value profitability might also be viewed as an indicator of a 'proto-global structure' which will later be manifest through other structural indicators—declining unionisation, greater global competitiveness, multinational operations, foreign ownership and capitalisation, etc. In other words, those monopoly and competitive sectors which are soon to restructure to global capitalism already display the lower exploitative capacity which is one of the features of global capitalism.

A related issue is the relationship between sectoral and aggregate rates of value profitability (the latter displayed in *Table 12*). Specifically, can a fall in the aggregate value profit rate be attributed, at least in part, to restructuring? This question is not easily disposed of. As indicated by *Table 11*, percentage declines in profitability are uniform regardless of the nature of the concomitant structural transition. Nevertheless, extremely low profitability is clearly associated with the global variant (see *Table 9*). As global sectors become hegemonic in the US economy, they will tend to pull the aggregate value rate of profit down.

Table 12
Aggregate Value Ratios, 1958 and 1982

Manufacturing only

Ratio	1958	1982
Organic composition of capital	23.58	28.18
Rate of surplus value	2.50	3.96
Rate of profit	0.69	0.52

All Productive Sectors

Ratio	1958	1982
Organic composition of capital	38.11	78.85
Rate of surplus value	2.77	4.32
Rate of profit	0.53	0.35

Sectoral Transition and Value Analysis: Qualitative Aspects

It is clear from the analysis of sectoral transition that monopoly capitalism is in decline. It is clear from the value analysis that the newly hegemonic global variant of capitalism has less exploitative potential than the monopoly or competitive variants. But these general findings, like the other findings reported above, conceal a wealth of complexity and difference. Not only are sectors undergoing similar transitions characterised by very different experiences of restructuring, but sectors which are experiencing different restructuring paths are subject to similar conditions. The two largest movements in US manufacturing over the period 1958-82, for example, were the transitions from monopoly to global and from monopoly to competitive. From our perspective these divergent movements are both linked to the emergence of global capitalism on the world stage. We would hypothesise, for the nine sectors being restructured to the competitive variant, that US firms have given up on domestic production or been driven out or provincialised by foreign firms pursuing a global production strategy. As a consequence, these sectors (e.g. textiles, apparel and paints) have fragmented into a set of relatively weak companies recording a major erosion of market share (US Department of Commerce, 1989).

Yet it is these sectors and the others which have remained in the competitive variant over the period 1958-82 that have the highest rates of surplus value and value rates of profit in the 1982 manufacturing economy. For the consumer goods sectors included in this group, it is likely that surplus value is being distributed in large measure to the highly centralised retail capital that controls final price levels. As supermarkets and department stores have become more international in their organisation and orientation, complex economic transactions have locked old and new competitive variant firms into subordinate relationships with global capital (Waldinger, 1986, pp.74-5). In the apparel industry, for example, there has been a resurgence of small immigrant enterprises under the pressure of international competition (Waldinger, 1986).

In the group restructuring to the global variant, we find sectors in which US based capital has been aggressively reshaping the contours of global production and maintaining its dominance in world markets (including food, chemicals,

drugs. petroleum, instruments, and optical equipment). But we also find sectors where US capital has been challenged both in global and domestic markets by international capital. In the motor vehicles, radio and TV, and electronics industries, US producers have restructured their domestic production in response to significant threats from Pacific Rim imports (US Department of Commerce, 1986). Major investments in fixed capital, as indicated by increases in the organic composition of capital in these sectors over the period 1958-82, represent corporate attempts to maintain a role in supplying the domestic market. Some of this investment has taken the form of joint venture agreements with those foreign companies who provided the competitive impetus to restructure production and labour relations (see, for example, Howes, 1992).

At the same time, three sectors that made the transition to the global variant (rubber, iron and steel, and metalworking machinery) showed a decline in sectoral organic composition over the period 1958 to 1982. The latter two suffered significant devalorisation of capital over this period. as they underwent major bouts of plant closure and business failure. Simultaneously, however they made the transition to global capitalism, largely by becoming targets for foreign investors attempting to circumvent government restrictions on imports and minimise the effect of currency fluctuations (D'Costa, 1992; Graham, 1992).

In summary, the disaggregated sectoral analysis highlights the persistence of sectors in the economy in which rampant exploitation is the norm. These exist alongside other sectors in which new equipment, new labour processes and new forms of labour relations contribute to a benign image of the post-industrial or 'post-Fordist' economy. What we see here is not a unidirectional trend in capitalist industrial development but a complex mosaic of industrial change.

Conclusions

The picture painted in our results is one of a complexly structured national economy in which the dynamic of restructuring is unevenly felt across sectors. While value theory may not offer a general explanation of sectoral transition, it provides an accounting system for analysing the ways in which the terrain of exploitation is being reshaped by changes in technology, the erosion of established work

practices, international flows of capital, and government intervention, among other processes. A value analysis offers a glimpse of the class implications of industrial change and, more particularly, of the new patterns of exploitation being forged as industries undergo technological, organisational and geographic transformation.

Though the research reported in this paper is still quite preliminary, its implications are potentially far-reaching. Our results clearly identify restructuring as a significant phenomenon for American manufacturing. More specifically, they indicate that what we call 'monopoly capitalism' is no longer hegemonic—providing an empirical counterpart to the many theoretical accounts of transition from Fordist to post-Fordist forms of industrial development (e.g. Harvey, 1989; Leborgne and Lipietz, 1988).

The transition from monopoly to global capitalism has significant consequences for industrial workers. In particular. under global capitalism the issue of firm location is often thrust into the forefront of labour-management struggle. Subsequent to financial reorganisation by global firms, industrial management demands givebacks as the price of staying put in a given location. In the face of the enhanced geographic and sectoral mobility of capital, conventional union strategies are often ineffectual (Clark, 1989).

The shift in hegemony from monopoly to global capitalism is also associated with a reduction in value profitability. This means that exploitative labour relations combined with technologically-induced productivity increases have not been able to increase surplus value per unit of capital advanced in global sectors. Restructuring, then, has greatly altered the capitalist class process of performing and appropriating surplus labour, but it has not made it more efficient.

Finally, our results indicate that the aggregate decline in value profit rates for the US is due, at least in part, to restructuring. Some Marxists might infer from this observation that restructuring is a factor in an economy-wide 'tendency for the value rate of profit to fall'.[16] From our perspective, the association of global restructuring with falling value profit rates helps to penetrate the logic of Marx's theory of the falling rate of profit. It appears that value profit rates cannot be construed as an indicator of competitive viability or systemic well-being. Indeed, Marx puts great emphasis on the

conjunction of technical innovation under capitalism with falling value profit rates, while rising profit rates are associated with devalorisation and decline. Though we might want to use such reasoning only in the context of a concrete historical instance, Marx's insight has a general implication—namely, that the exploitative capability of a given technology, system of labour relations, or form of industrial organisation is only indirectly and often contradictorily related to its competitiveness and its social hegemony. We must examine the capitalist class process empirically as it takes place in firms, industries, and economies rather than assuming that the competitive characteristics of such entities adequately reflect their exploitative potential.

Notes

1. We obviously reject Roemer's (1988, p.51) characterisation of value theory as the view that 'embodied labour values determine equilibrium prices'.
2. Resnick and Wolff (1987) describe, in addition to the fundamental class process of exploitation, what they call 'subsumed' class processes of distributing surplus labour.
3. See also Marx (1981b, p.275).
4. We define a sector as comprising all branches of industry in which the same use value is produced and assume that sectors are characterised by distinctive labour processes and forms of industrial organisation.
5. Marx's discussion of the impact of turnover time on circulating constant capital highlights such factors as selling time, distance from markets, the diversion of funds into speculative capital, and the means of transport and communication. His discussion elicits no clear tendency in this variable. See Marx (1981a, pp.326-33).
6. The use of interindustry data as the basis for value calculations is the subject of numerous critiques including those of Steedman (1977). The most formidable of these in our view is the 'embodied labour' critique (Himmelweit and Mohun, 1981). A good summary and literature review is available in Fine (1986).

7. The 1958 and 1982 computations are based on matrices employing 1963 and 1967 data respectively (US Department of Commerce, 1975).
8. Data obtained from the OBA Capital Stocks Data Base, supplied by Ken Rogers of the US Department of Commerce, Bureau of Economic Analysis.
9. Sectors excised include 69-71 (trade, finance and insurance, real estate), 73-74 (business services, eating and drinking places) and 77-85 (health, educational and social services; government 'enterprises'; and dummy and special industries). Some of these industries were omitted for reasons of data availability rather than on theoretical grounds. The latter two reflect I-O accounting procedures rather than actual industries.
10. The implicit assumption here is that the savings rate among productive wage earners is zero. Since the current US savings rate ranges from 2 to 4 per cent (US Council of Economic Advisors, 1989, p.338) and this rate is biased upward by the savings of the wealthy, our assumption cannot be too far off the mark.
11. See note 8 for data source.
12. Since the characterisation of capitalist variants is consistent over time, a classification function derived for any one year could be employed to classify observations for other years. We used a third year (i.e. in addition to 1958 and 1982) so that none of the classified observations would duplicate sample points classified a priori. 1977 was employed as the basis for classification in this study because a full array of data had already been developed by the authors for this year in connection with the analysis reported in Graham, *et al.* (1988). The problem remains, however, that industry definitions change over time, so that the sector being classified in any one of these three years may not be defined in exactly the way it was in the other years.
13. Discriminant function coefficients are reported below:

Variable	Competitive	Monopoly	Global
Constant	-19.290	-57.975	-76.928
Computerisation	0.092	0.186	0.380
Unionisation	0.063	0.106	0.090
Militancy	-16.372	-23.962	-22.734
Centralisation	0.482	0.871	0.847
Competing imports	-0.001	-0.001	-0.000
Foreign subsidiaries	0.562	1.170	2.157
Direct foreign investment	0.033	0.062	0.106

14. One factor mitigating the reduction in value profit rates for global sectors is the lower turnover time associated with global as compared to monopoly sectors (see *Table 9*). This may be due in part to more efficient use of working capital characteristic of global industries. exemplified by just-in time inventory control.

15. At the same time, it is intriguing to speculate on the existence of a 'positive feedback loop' in which a low value rate of profit makes global restructuring more likely, which in turn further lowers the sectoral value rate of profit.
16. Since we regard values as independent of rather than directly varying with prices, the implications of our results for the debate over the Okishio Theorem (see, for example, Van Parijs, 1979) are marginal. It is interesting, nonetheless, to observe an argument for a falling profit tendency which is clearly 'structural' in nature and independent of the micro-behaviors of individual capitalists.

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