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NEW DIRECTIONS IN MANAGENENT PRACTICES AND WORK ORGANIZATION

GENERAL PRINCIPLES AND NATIONAL TRAJECTORIES

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A B S T R A C T

This paper provides a synthesis of an international comparison of management practices and work organization accross five countries : United-States, France, Japon, Germany and Sweden. Five major results are put forward. First, evidence suggests that changes *away from fordism* are not transitory but delineate long run structural transformations. Second, at the end of the 80's, *tbasic principles of a new model* have seemingly emerged : based upon the recognition of skills and workers commitment, decentralisation of management, and long run contractual arrangements with suppliers. Third, the significance, generality and coherence of this post fordist model is assessed : *its superiority to previous fordist models* is established through case studies and international comparisons. Fourth, this model is not necessarily unique for all OECD countries. The paper argues for the existence of at least *three contrasted trajectories*, from toyotism to volvoism in passing by the german configuration. Finally, consequences will probably be far reaching, since changes in human resource management imply significant reorganization in industrial relations, general education and skills formation.

TENDANCES NOUVELLES DANS LA GESTION ET L'ORGANISATION DU TRAVAIL : PRINCIPES GENERAUX ET TRAJECTOIRES NATIONALES

R E S U M E

Cet article synthétise une comparaison internationale des modes de gestion des entreprises et de l'organisation du travail portant sur Etats-Unis, France, Japon, R.F.A., Suède. Il monte d'abord que les transformations intervenues sont très probablement de nature structurelle, et non pas simplement transitoires. Après une longue période d'essais et d'erreurs, à partir du milieu des années quatre-vingt ont émergé de nouveaux principes, alternatifs au fordisme typique : accent mis sur la compétence et la loyauté des salariés, rôle de la formation dans et hors de l'entreprise, plus grande décentralisation de la gestion, contractualisation longue de la relation salariale. Sont alors discutées la signification, la généralité et la cohérence de ce modèle alternatif, qualifié pour la commodité de toyotisme ou encore de volvoisme. C'est souligner la variété des configurations nationales susceptibles de mettre en oeuvre ces principes post-fordistes. En conséquence, les politiques d'éducation, de formation professionnelle, les relations du travail...et même la politique économique devraient connaître de significatives transformations, afin de permettre la diffusion de ce modèle qui apparaît d'ores et déjà supérieur à celui de l'après guerre.

Keywords : Work Organization, Management, Practices, Fordism, Toyotism, National trajectories.

Mots clés : Organisation du travail, Modèle de gestion, Fordisme, Toyotisme, Trajectoires nationales.

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NEW DIRECTIONS IN MANAGENENT PRACTICES AND WORK ORGANIZATION : GENERAL PRINCIPLES AND NATIONAL TRAJECTORIES

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S O M M A I R E

I - THE OLD MANAGEMENT STYLE HAS BEEN SEVERELY CHALLENGED.

§1. THE FORDIST PRINCIPLES AND THE POST WORLD WAR II GROWTH.

1. In retrospect, the exceptional growth since WWII seem to have been the outcome of an unprecedented set of institutions concerning capital labour relations, competition modes, public interventions, international systems which entered into synergy with the implementation of new technological process and the launching of new goods. The management has itself be transformed quite drastically, with respect to the interwar period. Let us delineate four major changes.

2. A *strong deepening of labour division* has been prominent since 1945. On one side, conventional scientific management institutes a clear distinction between conception and execution, production and maintenance, marketing and finance and so on. This launched an unprecedented technical and social division of tasks within and between firms. The changes took place massively in the manufacturing sector, but also permeated to some tertiary sectors, giving them an ideal type to be imited, even imperfectly and with qualifications. The general conception was simple indeed : the more specialized and divided the various activities, the greater productivity increases.

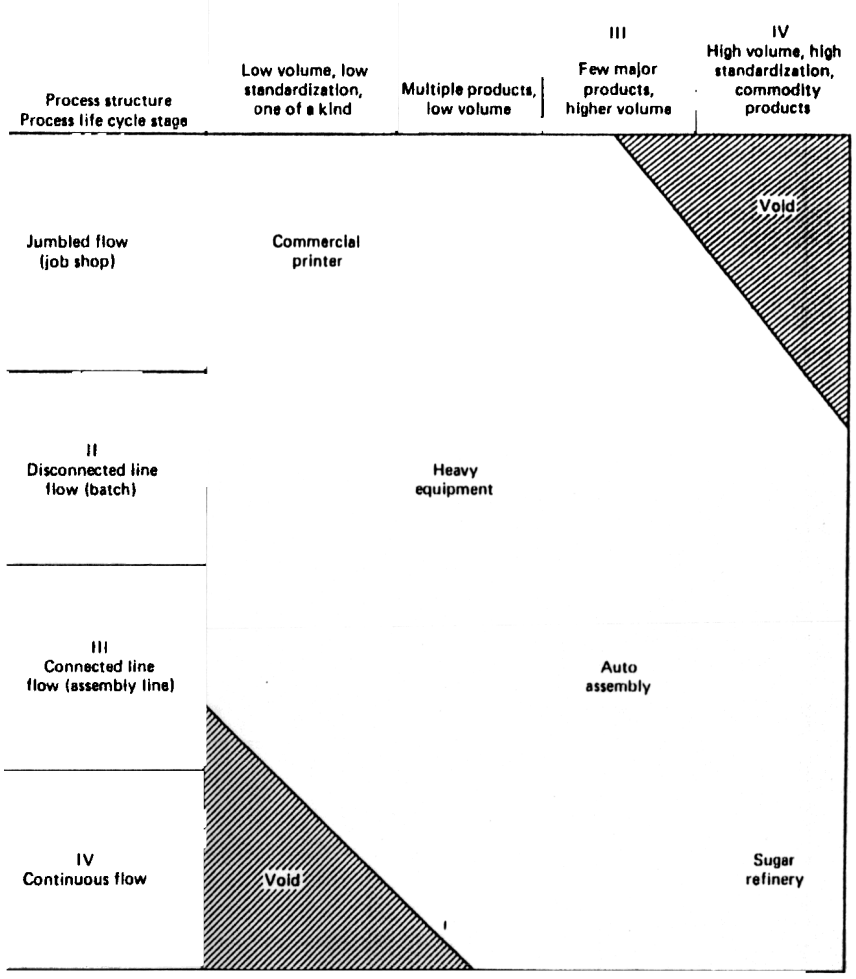
3. *Mechanisation* then took the form of *highly specialized equipments* designed in order to embody the larger part of technical knowledge avalaible for engineers and organizers. Therefore, the taylorist ideal, renewed by the invention of the assembly-line, was to mechanise so much the productive process that even workers with low or no education and skills could fulfil efficiently the very limited and specialised task he(she) was in charge of. Symmetrically, foremen, technicians and engineers would provide the technical and organizational knowledge necessary to the smooth functionning of the firm.

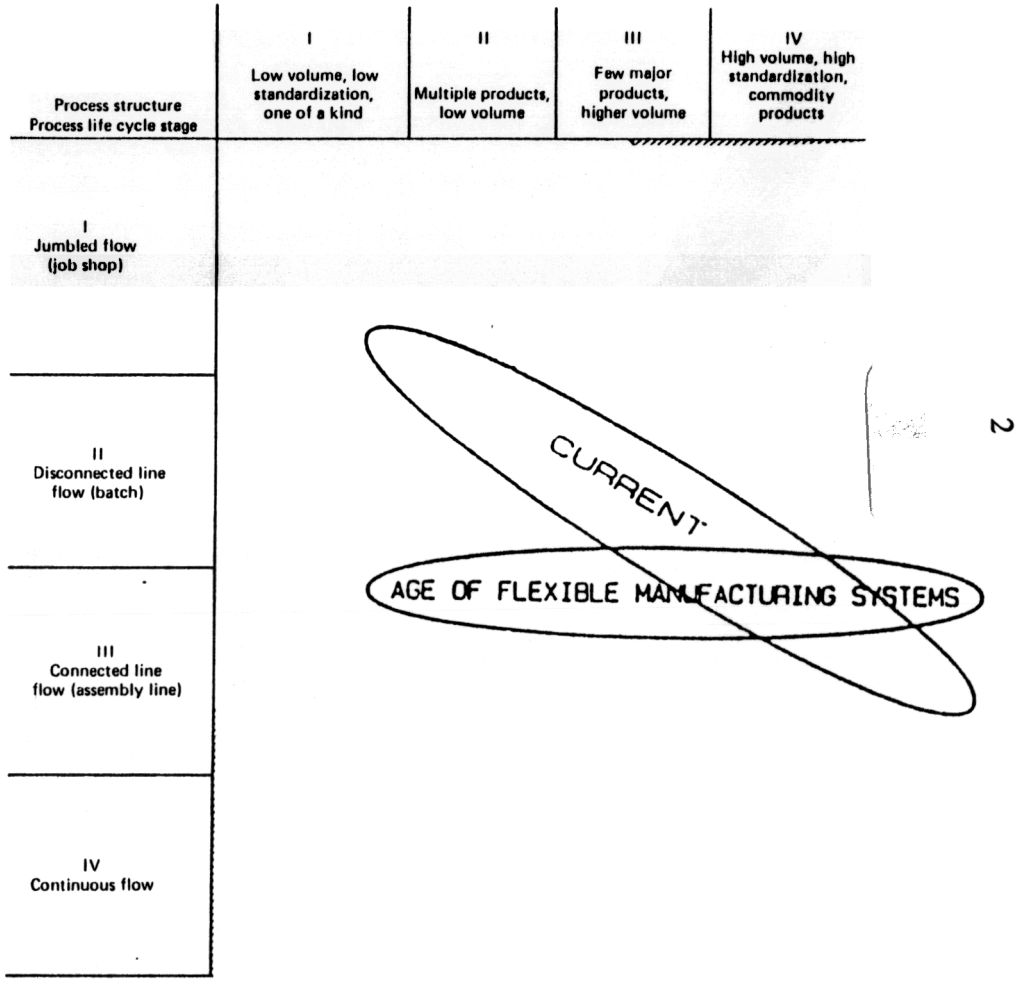
4. *Mass production of standardized goods* was the logical outcome for reaping the corresponding increasing returns to scale. First, the firm had to be sure of a large, stable and if possible increasing market, in order to reorganize assembly-line process. Second, a high capital output ratio implied a large break-even point, a feature which limited the implementation of typical fordist principles to mass production of final consumption goods. In the management literature, the well known product-process-matrix summarised this correspondance between the characteristic of the market and the choice between batch production, assembly-line and a continuous process (Figure 1). For equipment goods or very specific intermediate products, the large firm passes orders on to subcontractors, organised along batch or customized production.

5. *Good and rising wages* were the cost to be paid by firms in order to have rather repetitfve and usually boring tasks to be performed by blue-collar workers. Consequently, social peace and a low absenteeism or manpower turnover were obtained via an implicit or explicit compromise about productivity sharing. In the heyday of fordism, nominal wage was formed according to cost of living adjustment and an expectation of productivity increases, and financial position of the firm. Rather frequently in the Sixties, it turned out that large strikes initiated against taylorist and fordist methods resolved themselves into wage hikes.

FIGURE : FROM THE STANDARD PRODUCT-PROCESS MATRIX...

... TO ITS TRANSFORMATION VIA INFORMATION TECHNOLOGIES.





Source : R. HAYES, S.C. WHEELWRIGHT (1984), p. 209.

6. This fordist management style has been a key ingredient into the implementation of the very specific growth regime observed after WWII. On one side, the spread of division of labour and mechanisation enhanced productivity, therefore global disposable income. On the other side, the quasi-institutionalisation in most OECD countries of real wage increases stimulated mass consumption. Even investment was bouyant and reacted positively to a rather stable profit share and to the dynamism of home markets. Consequently, fordism as a method for organizing production process [ROOS (1989)] helped in promoting a genuine virtuous circle of growth [AGLIETTA (1982), BOYER (1988a)]. Roughly speaking, a management style ends up into a whole growth model (Figure 2), associated with new institutions about the form of competition, public interventions, monetary national regime, and of course the international trade and financial system [BOYER (1990a)].

7. This model born in the US has spread to West European countries and Japan, via the MARSHALL plan and the productivity movement according to which managers unionists and civil servants went to North America in order to grasp the major features of fordism as an organizational model for firms. Nevertheless, each country has not adopted a mere copy of the American manufacturing system but translated it and adapted its core principle to the existing social, economic and political context [CROUCH (1989)]. Therefore, the principles of scientific management took contrasted national forms. Building upon a previous comparative study [BOYER (1988a), (1990)], the following typology seems to emerge (Table 1).

8. In *France*, central state has been playing a major role in the implementation and the adaptation of this new industrial model, and very promising macroeconomic performances derived, at least partially, from the adoption of the fordist principles [BOYER (1983)]. *Japan* too converted these same principles into a genuine organization of firms given the initial small size of the market, the specific industrial relations built after WWII [CUSUMANO (1989)], the skills available and the general ideology of this society. The deskilling and the mechanisation have never been so extreme, a feature which delineates, at least and initially an hybrid fordism [WATANABE (1991)], at most and finally a genuine alternative model (see section IV.1). In *Sweden*, mass production for the home market was naturally out of reach, which implied an original implementation of a diversified quality production, in the luxury part of the car market for example [EDQUIST and GLIMELL (1991)]. Finally in former *West Germany*, a long tradition in vocational training, a good specialisation for the machine tool industries, the emphasis upon quality and servicing largely mitigated the pure fordist principle of mass-production. This could be called a flex-fordism, by opposition to the rather rigid organisation of the typical American system [PRIES and TRINCZEK (1991)].

9. Similarly within the countries, not every industry was able to implement fordist methods. In the building industries for example, the specificities of the labour process prevented the ideal of the continuous flow production to prevail [Du TERTRE (1989)]. In the process industry, as chemical and oil rafineries, most of the productivity derive from the equipment systems and its monitoring, at odds with the assembly-line typical of the car industry [VATIN (1987)]. Finally, most of the tertiary industries had special limitation in organizing along scientific management principles, even if they tried for example in the white collar work in the banking and the insurance companies [VERDIER (1985)]. Nevertheless, the fordist triad about mechanization-specialization-deskilling was nevertheless conceived as an ideal to be approached. Moreover, the organizational pattern specific to mass production turns out to be dominant in shaping the main macroeconomic

FIGURE 2 : THE FORDIST HYPOTHESIS IN A NUTSHELL

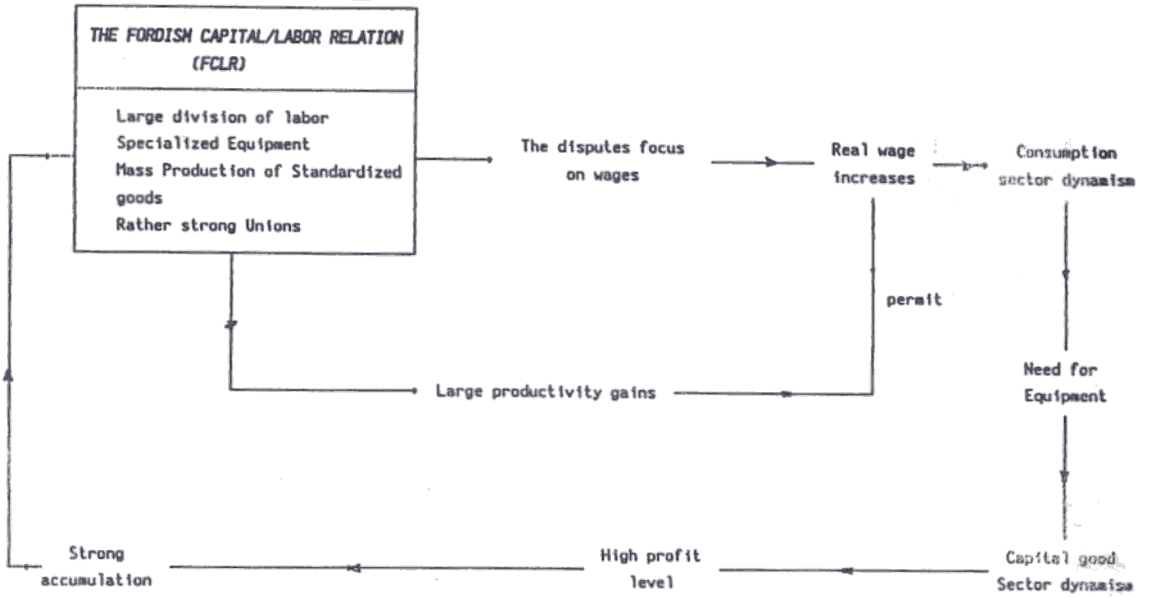


TABLE 1 : THE NATIONAL VARIANTS FOR FORDIST COMPROMISE: A TENTATIVE TYPOLOGY FOR THE GOLDEN AGE

COUNTRIES / COMPONENTS OF CAPITAL LABOR RELATION	FRANCE	JAPAN	SWEDEN	UNITED STATES	WEST-GERMANY
1. ORGANIZATION OF THE WORK PROCESS	Gap between conception and execution	More decentralized & solidaristic than in US	Genuine exceptions to Fordism	Typically Fordist	Professional & craft markets more than Fordism
2. STRATIFICATION OF SKILLS	Large & institutionnalized	Moderate	Moderate	High	Moderate
3. LABOUR MOBILITY	Low	Average	Average/ High	High	Average
4. WAGE FORMATION					
(i) Indexing with respect to . Price	Complete if not permitted	Complete	World more than consumer prices	Partial and/or slow	Slow and partial (forbidden)
. Productivity	Implicit	Explicit via bonuses	In the export sector	Implicit but existing	Rather strong
(ii) Influence of unemployment	Moderate	Surprisingly high	Significant	Average	Apparently low
(iii) Indirect wage and welfare (as proportion of direct wage)	High	Very low	High	Low	Average
5. LIFE STYLE AND CONSUMPTION NORMS	Closing gap	Fast closing gap	Modern with large welfare	Largely "commoditized"	Rapid Modernization
GLOBAL FEATURES OF FORDISM	STATE PUSHED	HYBRID FORDISM	DEMOCRATIC FORDISM	GENUINE FORDISM	FLEX-FORDISM

Sources for filling the rows of Figure 2 :
Lines 1 and 2 : Mainly M. CAMPINOS-DUBERNET and GRANDO J.M. (1988), M. AOKI (1988), B. STRAH (1988), OECD "Structural Adjustments and Economic Performance".
Line 3 : OECD (1986) "Flexibility and labor markets", p. 63, Table II.3 for 1971, or p. 66, Table II.4.
Line 4 : id, p. 17, Table I.2.
(i) and (ii) For the indexing with respect to productivity P. PORET (1986), Table 7, p. 24. for some countries J.H. CHAN-LEE & Alii (1987), p. 151, Table 6.
(iii) J.H. CHAN-LEE, D.T. COE, M. PRYWES (1987), Table 1, p. 144.
Line 5 : L. LEVY-GARBOUA (1982)

relations. In other words, even though labour organization remained quite diversified, the growth regime was typically fordist.

§2. RISING AND CONVERGING UNBALANCES.

10. Nevertheless, a series of tensions have progressively been emerging within this organizational model. One of the first evidence took place at the end of the Sixties when low skilled blue collar workers working in the car industry rebelled against the respective and boring character of assembly-line tasks. Wild or organized strikes did challenge the fordist methods, which in some country like Italy led to a new law giving some power to workers and unions in controlling labour organization and the intensity of work. Similarly in France, the same demand were converted into wage increases after the huge strikes in May 1968. In the US, the fordist malaise took a more hidden form via a rise in absenteeism, turnover or a lower quality or productivity increases [ABERNATHY, CLARK, KANTROW (1983)]. *Social unrest against taylorism and fordism*, even if rather limited, was the first warning about the limit of this model.

11. More deeply, *better educated generations* tend to reject the basic fordist axioms according to which work is only related to physical and mechanical abilities, with little initiative or intellectual creativity. Consequently, most OECD countries experienced rising difficulties in recruiting workers which would accept the more irksomemanufacturing tasks: since migration from agriculture to industry slowed down, most European countries had to rely upon migrant workers, for an increasing proportion in the manufacturing and the building industry. A second root of fordist crisis lay precisely in this discrepancy between the deskilling tendency of scientific management for a fraction of wrokers and rising expectations about the quality and initiative of work [TARENTELLI (1986)].

12. But this creeping social crisis is complemented by very strong strains affecting the core economic mechanisms of post WWII growth. As a consequence of workers'dissatisfaction, firms tried to push ahead further with mechanisation. At the end of the Sixties and early Seventies, one observes a rising capital output ratio which did not convert itself into more productivity [GLYN (1990), SCHOR Coord. (1990)]. *The puzzling decline of apparent as well as total productivity* increases for the US economy and many manufacturing industries, well before the first oil shock is an indirect but significant evidence of post WWII productive organization. Nevertheless, the productivity slowdown occurred only in the Seventies for most OECD countries with the exception of the United States. This is another evidence for the specificities of national trajectories, the hybridation of American methods with national institutions, habits and specialization.

13. With the 1974-75 recession another limit becomes apparent : the productivity undergoes more severe slowdown or even decline in the most typical fordist industries. Given the large indivisibilities associated with assembly lines -or even continuous processes-, labour can no more be varied continuously, whereas low capacity utilisation implies a slowing down of total productivity. Even corrected by the degree of utilisation, the imbalances between existing equipment and the precise composition of demand show up into a significant and general deceleration of efficiency indexes, in most OECD countries [ENGLANDER, MITTELSTADT (1989)]. Here comes a new but basic complaint about fordist organization : its *excessive rigidity* facing unexpected variation in demand. Therefore, the need for a significant revision in engineering principles come to the surface [AYRES (1990), PIORE and SABEL (1984)].

TABLE 2 INFORMATION TECHNOLOGIES PROVIDE ONE FORM OF FLEXIBILITY

	Organisation of production	Hierarchy of skills	Mobility of workers	Formation of wages	Social security coverage
Definitions:	Adjustability of equipment to variable demand in terms of volume and composition	Adaptability of workers to a variety of tasks, whether complex or not	Possibility of varying employment and hours of work according to the local or overall situation	Sensitivity of wages to the situation of the enterprises and the labour market	Elimination of tax and social transfer provisions having an unfavourable effect on employment
Components:	Multipurpose equipment Immediate responsiveness of the chain of production and optimum management of production flows Adaptation of the product to consumer demands and to instantaneous demand	Range of technical or general training Rotation of posts within a work unit Relative proximity of production and supervisory tasks Absence of barriers between supervisory and operational staff	Absence of any major constraint deriving from labour law Fluidity of inter-regional migration (housing, etc.) Non-existence of rights peculiar to a specific enterprise (social benefits, retirement) Responsiveness of employment to wage differentials	At the macro level: – average wage a reflection of unemployment, productivity and terms of trade – no restrictive minimum wage At the micro level: – constant review in the light of local circumstances – weakening of wage parity argument	No compulsory contributions that increase the cost of labour for enterprises Suppression of social and fiscal thresholds Reduction in social security contributions payable by the enterprises Private insurance/ collective coverage option
Keynote:	Flexible factory	Proudhonian worker	On-hire workers	Worker participation wage	Two-tier wage system
References:	Kundig (1984) Besson (1983) Coriat (1983)	Archier (1984) Piore and Sabel (1981, 1984) Schumacher (1977)	Gattaz (1984, 1985) Gilder (1985)	Weitzman (1984) General Motors (1985)	Harris and Seldon (1979)

Source : R. BOYER (1987) "Labour flexibilities : many forms, uncertain effects", *Labour and Society*, Vol. 12, n° 1, January, p. 107-129, (p. 108 et 112).

14. The large inertia of mass production concerns *quality and versatility of the product offered* [STREECK (1991)], and not only the quantity of standardized goods. In consumer durable goods, for example for the cars, when the market turns from prime users to a largely renewal of used cars, the quality and the differentiation appears to be a key argument in this new competition era : in a buyers market, consumers become more choosy and very sensitive to the quality, not only cosmetic but linked to servicing, durability, user costs and so on... Again, the very large lag between the perception of a new demand, the conception of alternative products and then their production at low cost impairs the adaptability of fordist organization [LORINO (1989)]. Managers and academics then rediscover that in the product-process matrix, craft production and diversified quality production become economically efficient and rational in such a context (Figure 1).

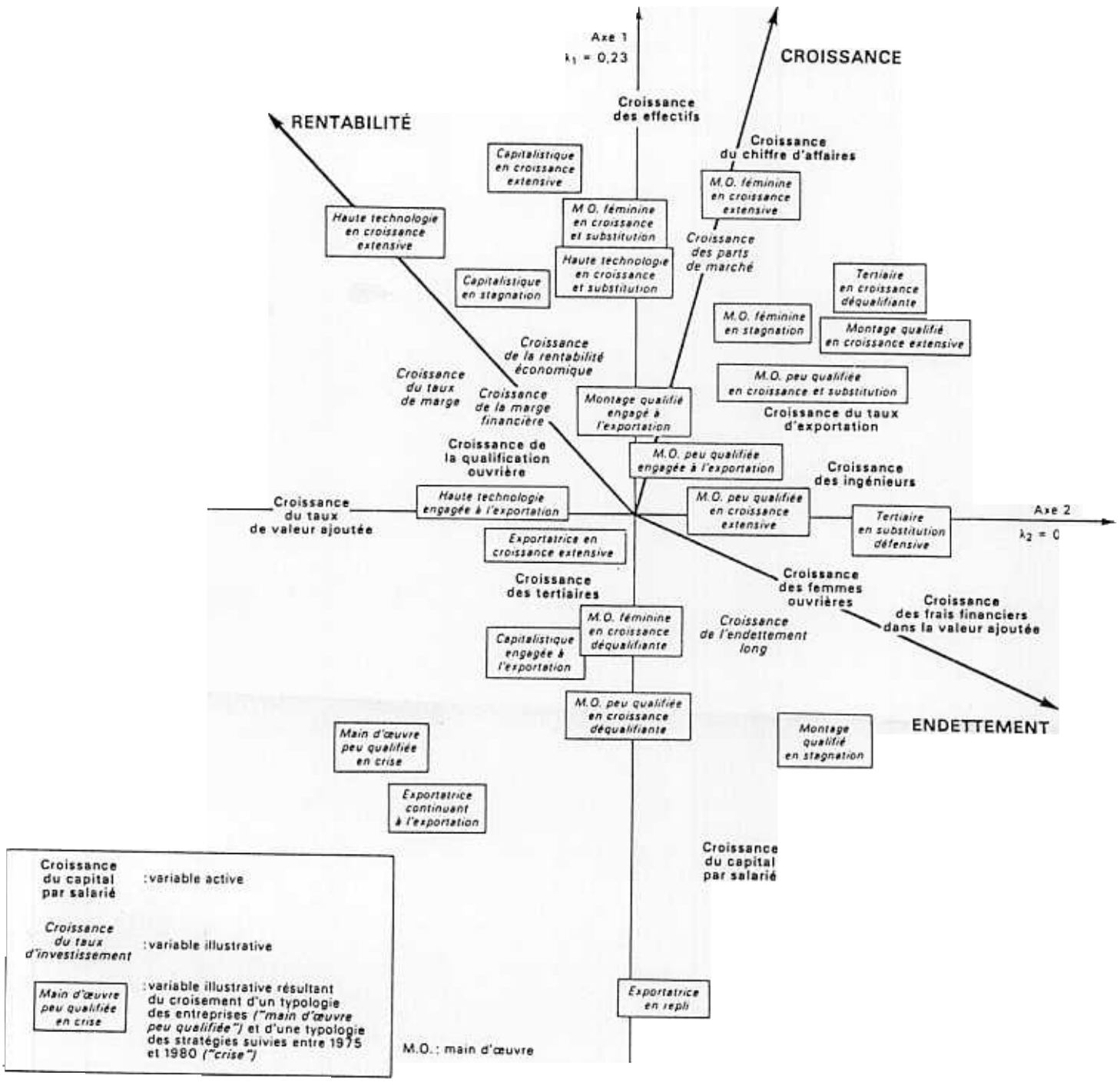
15. *World wide competition* simultaneously and progressively destabilized the fordist oligopolistic competition, which used to operate in each national market. From the mid-Sixties till the Eighties, external trade has developed faster than home market, potentially breaking down the very smooth and peace ful competition. Since capacities are generally under utilized, price wars take place, during which the speed in reacting to market opportunities plays a key role. The fordist methods are then outperformed by more flexible hybrids, such as those operating in former West Germany, Italy, Sweden and Japan. Simultaneously, the fordist macroeconomic virtuous circle is challenged by export led strategies and the rising uncertainty of the world financial and trade system. This is another pressure upon typical fordism [BOYER (1988a)]. Intuitively enough, national manufacturing industries are the more competitive, the more distant they were with respect to typical mass production organization.

16. Another root of destabilizatlon is related to the progressive *exhaustion of the very cluster of innovations* which had launched the fordist dynamics : one observes a decline of the efficiency of R & D expenditures in mature industries such as mechanical engineering, chemistry, aerospace [PATEL and SOETE (1987), PAVITT, PATEL (1988)]. But symmetrically, sunrise industries tend to appear in order to replace older ones : R & D in electronics and software is exploding and convert into a generation of new products and processes [SOETE, VERSPAGEN, PATEL, PAVITT (1989)]. All these innovations seem to delineate a possible shift in paradigmatic organization, due to the potential impact of information technologies [FREEMAN (1989), SUNDQVIST's report OECD (1988a)].

17. These innovations might have far reaching consequences about the fate of fordist methods and products. On one side, the large assembly-line used to suffer from unbalances between the various tasks and very significant costs and lags associated with the retooling of equipment due to model change. During the Fifties, some Japanese firms had already conceived alternative industrial organizations in order to cope with product differentiation [OHNO (1978)]. In the Seventies and Eighties, numerical controled machines, robots, integration of various equipments via an electronic network, the easiness of reconfiguring electronic equipment then introduce significant *technical flexibilities*. The same equipment can now be used to manufacture different products belonging to the same general type. This is a way to fight against one of the adverse trend under fordism : the decline in the output capital ratio [AYRES (1985), BOYER and CORIAT (1986), GLYN (1990)]. On the product side, the versatility of equipments and/or of workers allows faster reaction in the qualitative shifts in the final and intermediate demand. This gives a premium to more flexible organizations in the new context of a stiffening of international competition.

FIGURE 3 ***SOME EVIDENCES ABOUT THE VIABILITY OF RESKILLING STRATEGY EVEN FOR FIRMS WITH INITIAL LOW SKILLS.***

A SAMPLE OF FRENCH FIRMS (1975-1980-1983)



Source : P. CHOFFEL & Alii (1988) : Des trajectoires marquées par la structure de l'entreprise, *Economie et Statistique*, n° 213, Septembre, p. 41-50 (p. 46).

18. Even if very important, information technology [DESCHENES (1989)] is not the only factor responsible for the *general search for flexibility*. First, the kanban system used to need only a piece of paper [SHINGO (1983)] ; of course, computers and networking can still rationalize and improve a fairly efficient device. Even in Japan, this "informatisation" seems to be a rather recent [VALERY (1989)]. Moreover, experience shows that reorganization and rationalization of productive flows precedes any tentative informatisation. On the contrary, premature efforts seem to have led to large disappointments, in conformity with a permanent teaching of the history of techniques : mechanization follows prior rationalization of tasks and flows. Second, technical flexibility is only one out of a whole spectrum of *flexibility strategies* (Table 2). For example, multiskilled workers can in some cases replace heavy mechanization or even informatisation, not to speak of more traditional flexibilities. Varying the hours worked, reducing employment, adjusting wages to economic environment are alternative tools, which combine themselves into quite distinctive national management styles.

II - IN THE NINETIES, A NEW MODEL OF MANAGEMENT AND WORK ORGANIZATION HAS EMERGED.

19. All the changes previously described have initially been conceived and implemented as partial and sometimes short run reactions to the fordist productive limits. All along the Seventies and Eighties, managers, engineers and academics have been experimenting according to a trial and error process. Business fads have emerged, generated enthusiasm, and when implemented have generally delivered poor or disappointing results. Nowadays, it seems not too daring to think that some converging views have emerged, as far as management is concerned. Of course, management practices are still rather different accross OECD countries : the comparison of the five national studies specially conceived to enlighten this report does exhibit very distinct efffective strategies in US and Japan, in France and former former West Germany, the Swedish model being largely original. Before addressing to this issue (IV), let us argue that a possible follower to fordism has now a fairly coherent theoretical basis.

§1. AFTER THE TWO OIL SHOCKS, RATHER CONSERVATIVE STRATEGIES, AT THE MARGIN OF FORDISM.

20. Some firms or sectorshave exported conventional fordist methods to new geographical areas (for example, credit and direct investment to Latin American countries in the Seventies). Others have kept previous management devices, but implemented defensive flexibility, for example lowering wages in order to preserve obsolete fordist jobs or favour new tertiary jobs. Still others are using the opportunities raised by new information technologies in order to keep alive fordist principles (strong division of conception and execution, strengthening of monitoring over labour, control of labour intensity by new computerized machine tools). Finally, the rise of the service sectors and the deepening of labour market segmentation have been widely used in order to compensate the crisis within the manufacturing fordist sectors [BOYER (1988a)].

21. Nevertheless, international comparisons [HOLLINGSWORTH and al. (1989)] suggest that these four strategies do not necessarily solve the crisis of the previous management

TABLE 3 : FROM FORDISM TO A NEW MODEL : A SYNOPTIC PRESENTATION

FORDIST PRINCIPLES	THE CHALLENGES OF THE 70's AND 80's	THE PRINCIPLES OF A NEW MODEL
F1 : Rationalisation of labour is the main target, mechanisation is the means	C1 : Under-utilisation of equipment, large inventories of work in process	P1 : Global optimisation of the whole productive flows
F2 : First design and then manufacture and organize work process	C2 : Lags and large costs in passing from innovation to effective production	P2 : Tentative full integration of research, development and production
F3 : Indirect and mediated links with consumers via marketing studies and strategies	C3 : Loosing touch with choosy consumers, failures in launching new products	P3 : Close and long lasting ties between producers and users, capture learning by using effects
F4 : Low cost for standardised products is the first objective, quality the second one	C4 : Ex-post quality controls cannot prevent a rising defect rate, consumers more selective about quality	P4 : High quality at reasonable costs, via a zero defect objective at each stage of the production process
F5 : Mass production for stable and rising demands, batch production for unstable demands	C5 : Even mass consumers demand become uncertain : the fordist production process appears as rigid	P5 : Insert the market demand into the production process, in order to get fast responses
F6 : Centralisation of most decisions about production in a special division of a large firm	C6 : Sluggish and unadequate reaction of head quarters to global and local shocks	P6 : Decentralization as far as possible of production decisions within smaller and less hierarchical units
F7 : Vertical integration, mitigated by circles of subcontractors	C7 : Given radical innovations, even large firms can no more master the whole techniques needed for their core business	P7 : Net working (and joint ventures), as a method for reaping both specialisation and coordination gains
F8 : Facing cyclical demand, subcontractors are used as stabilizing device, in order to preserve large firms'employment	C8 : During the 70's, bankrupcies and/or loss of competence of subcontractors, now confronted with international competition	P8 : Long run and cooperative subcontracting as far as possible, in order to promote joint technical innovations
F9 : Divide and specialize at most productive tasks, main source of productivity increases	C9 : Excessive labour division might turn counterproductive : rising control and monitoring costs ; built-in rigidity	P9 : To recompose production, maintenance, quality control and some management tasks might be more efficient, technically and economically
F10: Minimize the required general education and on the job training of productive tasks, according to the BABBAGE's and TAYLOR's principles	C10: New techical opportunities (IT), more competition and uncertain demands challenge most of the previous very specialized tasks	P10: A new alliance between a minimal general education and effective on the job training, in order to maximize individual and collective competence
F11: Hierarchical control and purely financial incentives to manufacture an implicit consent to poor job content	C11: Young generations,better educated and with different expectations, reject authoritarian management styles. Too much control becomes counterproductive	P11: Human ressources policies have to spur workers'competence and commitment and work out positive support for firms strategy
F12: Adversarial industrial relations converge towards wage demands ; collective agreement codify a provisional armistice	C12: Firms employment might be hurt by the lack of cooperation and an exclusive concern for wage A contrario, concession bargaining does not necessarily provide any advantage for wage-earners	P12: An explicit and long term compromise between managers and wage earners is needed to reap a general support to this model : commitment versus good working conditions and/or job tenures and/or a fair sharing of modernisation dividends

model, even if they can help in passing from one regime to another. Comparing, for example, US and Japan, the rather defensive stategy adopted in North America, along very traditional fordist principles, seems to have delivered poorer results than has the more innovative management style worked out by the Japanese managers. Similarly, the very sluggish adaptation of the British manufacturing industry has given a lot of opportunities to Japanese direct investments in some key sectors such as the car and the consumer electronics. The rather defensive strategy used by English managers has been outperformed by the quite and surprisingly successful introduction of new and different principles.

22. The same result seems to emerge from systematic statistical analysis of firms trajectories during the Seventies and the Eighties. In the case of France, It has been convincingly shown that sticking to old taylorist principles of deskilling has usually led to very disappointing results [CHOFFEL, CUNEO and KRAMARZ (1988)]. First small or medium size firms with high technical knowledge and sufficient workers'skills have succeeded in getting access to new external markets, which have replaced the national ones (Figure 3). Second, between large firms, only those which have mitigated or abandoned the deskilling of blue collar workers inherent to fordism have succeeded in limiting job destruction [BOISARD, LETABLIER (1988)]. On the contrary, a large majority of firms still following their previous taylorist strategies has incurred serious troubles. Consequently, within the same country, alternative strategies have provided better performances.

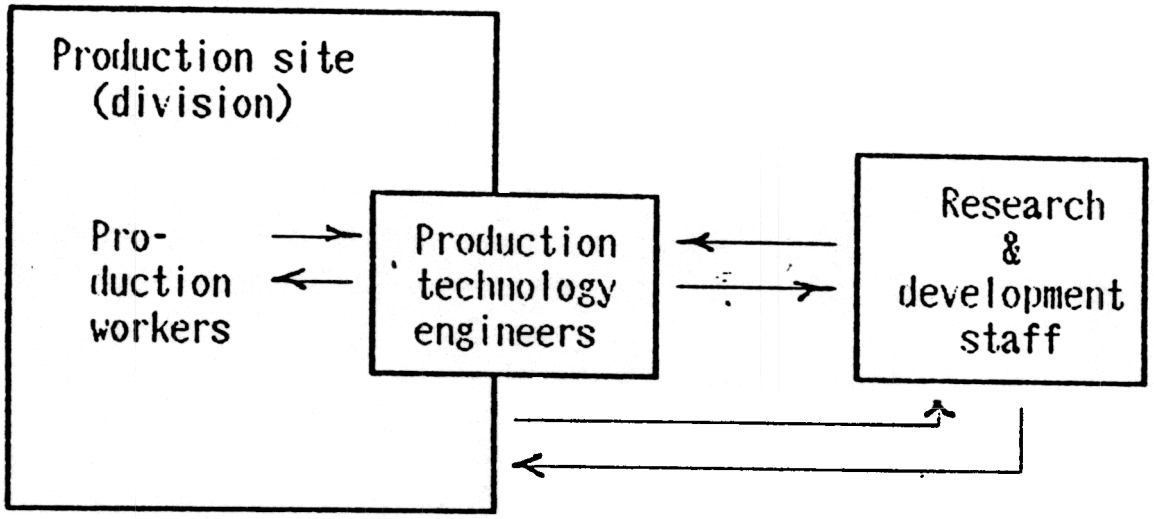
§2. THE TWELVE PRINCIPLES FOR A GENUINE AND EFFICIENT MANAGEMENT STYLE.

23. Compiling a series of researches, elaborated by specialists of management, technical change, industrial relations, political scientists comparing governance modes, one gets the feeling that some common principles have now emerged. As far as ideas and theoretical conceptions are concerned, reading the five case studies reveals a striking convergence about the main features of what should be an ideal model. Twelve principles can be elaborated into a possibly coherent new management style, able to cope with the new features of the world economy in the Nineties (Table 3).

24. *Global optimization of productive flows* (Pl), which was a traditional objective of scientific management, was progressively somehow forgotten by actual fordist management practices. Heavy mechanisation and large inventories were conceived as methods for counterbalancing equipment failures, workers'lack of discipline and possible disruption due to strikes. Consequently, during the Sixties in the car industry for example, very costly and specialized equipments were quite under-utilized, initiating a decline in the productivity of capital. The new management model takes into full account that the full optimization of the whole productive flows has to deal symmetrically with labour, intermediate products and equipments. In other words, if taylorism was fighting against workers laziness and under-utilization, the new system fights against equipement under-utilization and excessive inventories, due to idle working processes. The Just in Time has precisely this objective, very much in line indeed with original scientific management strategies. Total factor productivity including the rotation speed of circulating capital has replaced labour productivity as a major index for technical efficiency.

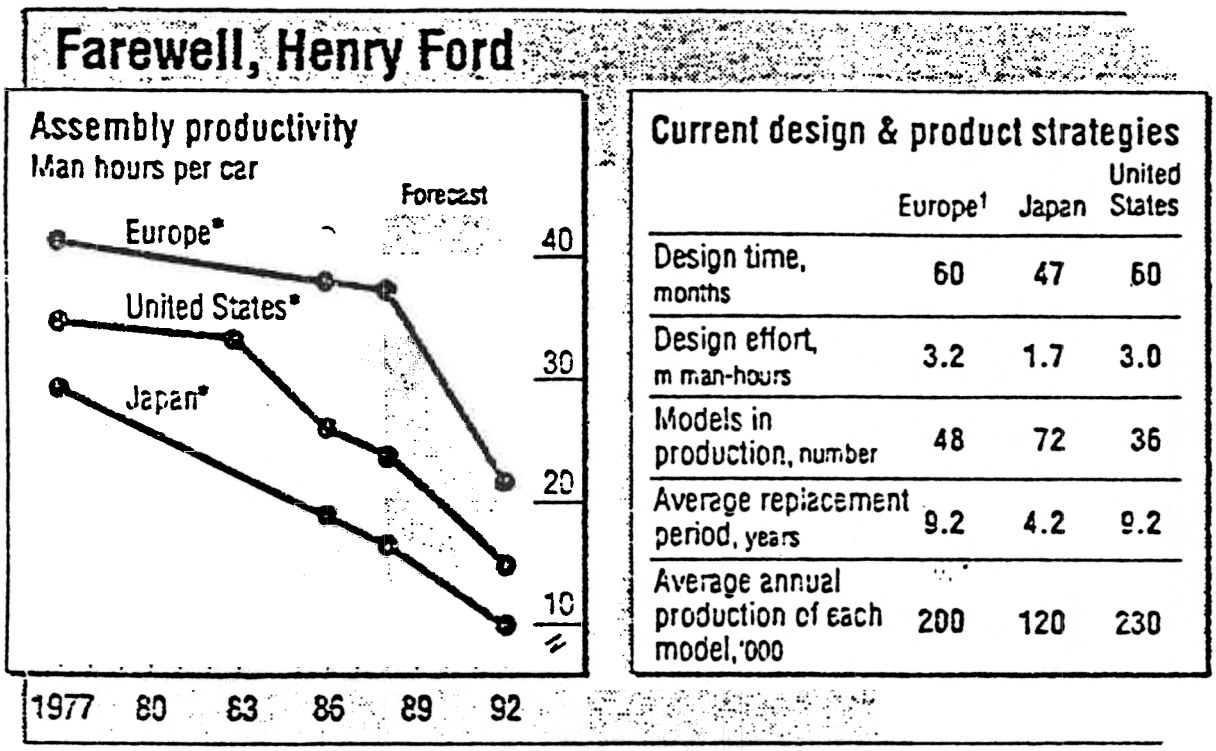
INTEGRATION BETWEEN DESIGN AND MANUFACTURING : MORE FLEXIBILITY AND PRODUCTIVITY.

FIGURE 4 : THE ROLE OF PERSONNEL MOBILITY



Source : S. WATANABE (1989) "The diffusion of new technologies, management style...", p. 3.

FIGURE 5 : A KEY IMPACT UPON ECONOMIC PERFORMANCE



The Economist, Harvard University, June 1989.

25. *Fully integrated research, development and production organization* (P2) is the second major principle. In typical fordist mass production, the sequence was clearly oriented from design, then production and ultimately to marketing. The division in charge of conceiving the new products did not really integrate any clear vision about the methods for manufacturing them, nor do they carefully assess the needs and the demands to be satisfied. Consequently, the lag between design and mass production of a new model used to be around six-seven years for the car industry. Simultaneously, the product could turn out to be a failure if in between the market trends had reversed (for example from large cars to fuel efficient ones). Moreover, in the Seventies and Eighties, the versatility of demand has shown the process of design and innovation in conventional fordist organization to be very sluggish. Therefore it is not really surprising if management theory now stresses the need for a fuller integration between these three stages. The sequential relation between design and manufacturing is replaced by pooled or reciprocal coordinating mechanisms [ADLER (1991)]. All the national studies point out many experiments of plant integration, in which macroelectronics allows closed and fast connections between design, production programmation, quality control and planning : this is for example the case for German capital good industry [SCHULTZ and WILD (1988)]. In Japan, the management style seems to rely more upon engineers and technicians mobility from research and development department to the production site, back and forth (Figure 4). Nevertheless, a process of computarization is likely to be implemented in the Nineties [N. VALERY (1989)]. Such an integration has a significant impact upon economic performances : average design time is far lower in Japan in Europe and US, design efforts are lower and consequently, more models can be launched each year (figure 5). Last but not least, the break even point is lower in Japan than elsewhere due to this saving in design and investment expenditures. Both flexibility and productivity are therefore simultaneously better off contrary to the usual trade off which was the dilemma of fordism.

26. *Closer relationship between producers and users* (P3) introduces a third break-through with respect to typical fordism. Previously, the marketing division was trying to find out how to launch and sell the product elaborated by the production department, itself inspired by scientific organization principles. Therefore, the adequacy of new products to consumers needs was an *ex post* and henceforth sometimes costly process. Now the more successful firms seem to have elaborated a two-way flow of communications between people conceiving new products and the users themselves. This is specially so for sophisticated equipment goods, as well as for consumer durables. Again, the Japanese firms give a good example of a better integration of the R & D department, production department and marketing division. It has been suggested that such a strategy reduces the risk of failures. In the car industry for example, since a sample of potential consumer have helped in designing the final product. In industries such as the computers, a large source of innovation comes from the needs and proposals of final user, for example in software. In this sector, as in the machine tool industry [WATANABE (1991)], the closeness and the cumulativeness of the links between final users and designer enhances massive effects due to learning by doing [Von HIPPEL (1988), LUNDWALL (1989)].

27. *High quality at reasonable cost* (P4) can now be reached within the new management system. In the past, mass production of cheap but low quality goods was complemented by craft and customized production of top quality luxury goods. In the old system, a clear trade off had to be made between low cost and high quality. This feature turned out to be quite detrimental to many fordist industries. In the car manufacturing for example, when the bouyant market of new buyers shifted into a mere replacement demand, more

CAN TOP QUALITY BE COMBINED WITH LOW UNIT COSTS ?

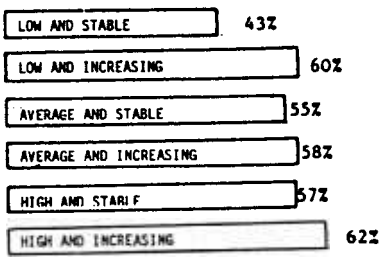
TABLE 4.A : PERFORMANCE LEVEL BY TECHNOLOGY/MANAGEMENT CATEGORIES

	Productivity (avg.hours/vehicle)	Quality (avg.assembly defects/100)
Low Tech-Robust/Buffered	**40.0**	**104.9**
High Tech-Robust/Buffered	29.6	80.4
Low Tech-Fragile/Lean	29.5	86.5
High Tech-Fragile/Lean	**21.1**	**59.8**

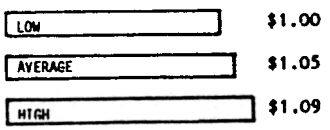
Source : ROOS (1989) "The importance of organisational Structure and Production System Design in Development of New Technology", p. 10.

4.B : QUALITY BRINGS.....

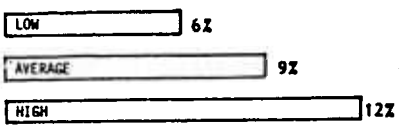
...MARKET SHARES (%)



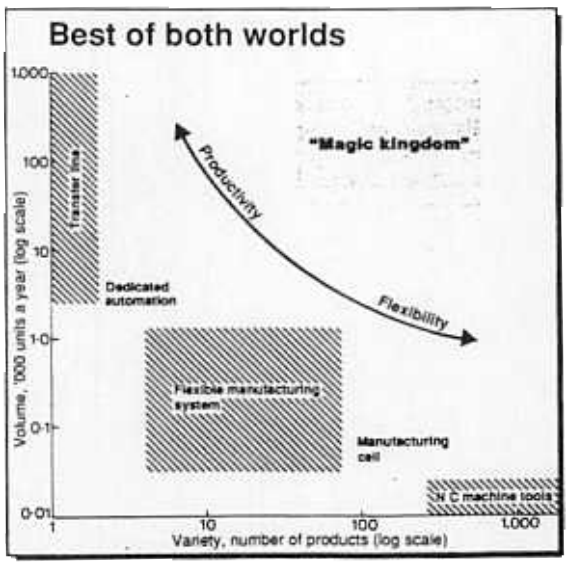
.OLIGOPOLISTIC PRICING



.AND THEREFORE HIGHER PROFITS



4.C : THE BEST OF BOTH WORLDS : FLEXIBILITY AND PRODUCTIVITY



Source : (5.B) M. AGLIETTA, R. BOYER (1982) Une industrie compétitive en France et dans le monde, in *Une politique industrielle pour la France*, La Documentation Française, Paris.
(5.C) The Economist (1987), The factory of the Future : a survey, May 30, p. 4.

sophisticated consumers became aware of quality and become much more choosy than previously. Typical american mass producers were consequently challenged by Japanese, German and Swedish models which used to integrate a larger concern for servicing, durability, fuel efficiency and so on. But traditionally high quality was associated with small or medium size runs. The electronization of equipment goods, in particular the computerization of design and manufacturing, has provided both a lower cost (since the change from one model to another can take only few minutes and no more a whole day or week) and greater precision in metal cutting, melting, assembling. The TOYOTA system [JACOT (1990)] therefore provide, via a fragile/lean system in contrast to the robust/buffered typical fordist production, both higher productivity and better quality (Table 4).

28. *Insert the market demand into the production process*(P5) defines another new principle. Again, within fordist methods, production capacities were set in order to satisfy the lower demand given the cyclical pattern which characterized the Sixties. By definition, the ideal was to immune the assembly-line from any perturbation from the environment. Subcontractors or second rank producers were precisely given the role to cope with uncertainty and variability [PIORE and SABEL (1984)]. This arrangement broke down when even mass consumer demand becomes uncertain, in volume and composition. Given a significant internationalisation of markets, the demand could now be satisfied by imported goods providing much more diversity. Here comes, the well known problem about the technical rigidity inherent to conventional fordism. This new context initiated a genuine adaptation of scientific management : given the new flexibility allowed by electronized machine tools, production can be now decided according to the effective orders, and no more for building inventories of goods to be sold afterward [OHNO (1978)]. Consequently, even fluctuating demand can be meet by flexible automated production and symmetrically, small or medium size firms can master a segment of the market. Therefore, the traditional division between large and smaller firms is blurred : both of them have to cope with more variability of demand. There is not any more any close relationship between production volume and productive organization, as used to be observed within fordism (Figure 1).

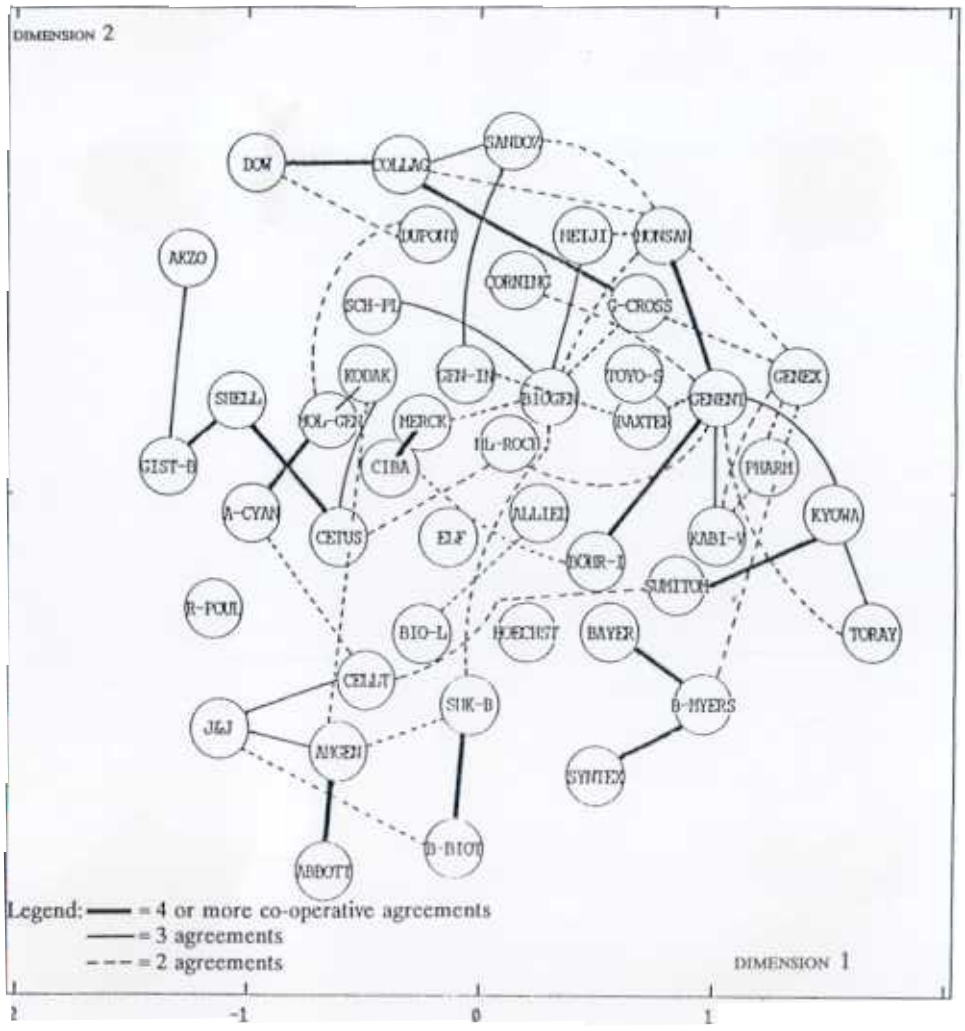
29. *More decentralization of production decisions* and lower size of plants (P6) are the direct consequences of previous principles. During the golden Sixties, labour management could be centralized within a specialized department, each plant being given a limited autonomy in order to implement the sophisticated rules associated to internal labour markets. Now, the variety of local and sectoral situations call for a larger autonomy of each plant. Even more, one observes on a large scale, a trials and errors process, in order to find out new principles for workers' commitment and pay. Theoretical models have clearly shown that when demand is uncertain and shifting from one product to another, then up to a certain limit in the degree of uncertainty decentralization might be more efficient than complete centralization [AOKI (1985]. Given the new context of the Eighties and Nineties, the same objectives of scientific management would now be fulfilled by a quite different internal organization of the large firm : the J firm (the Japanese model) would replace the Fordist or American firm, and its division by vertical departments, only integrated at the summit of the hierarchy [AOKI (1988)]. Simultaneously, international comparative datas exhibit a decline in average plant size will be used, a possible evidence for the progressive implementation of this sixth principle [SENGENBERGER and LOVEMAN (1987)].

FIGURE 6 : NETWORKING, ONE CODE WORD OF THE NEW MODEL...

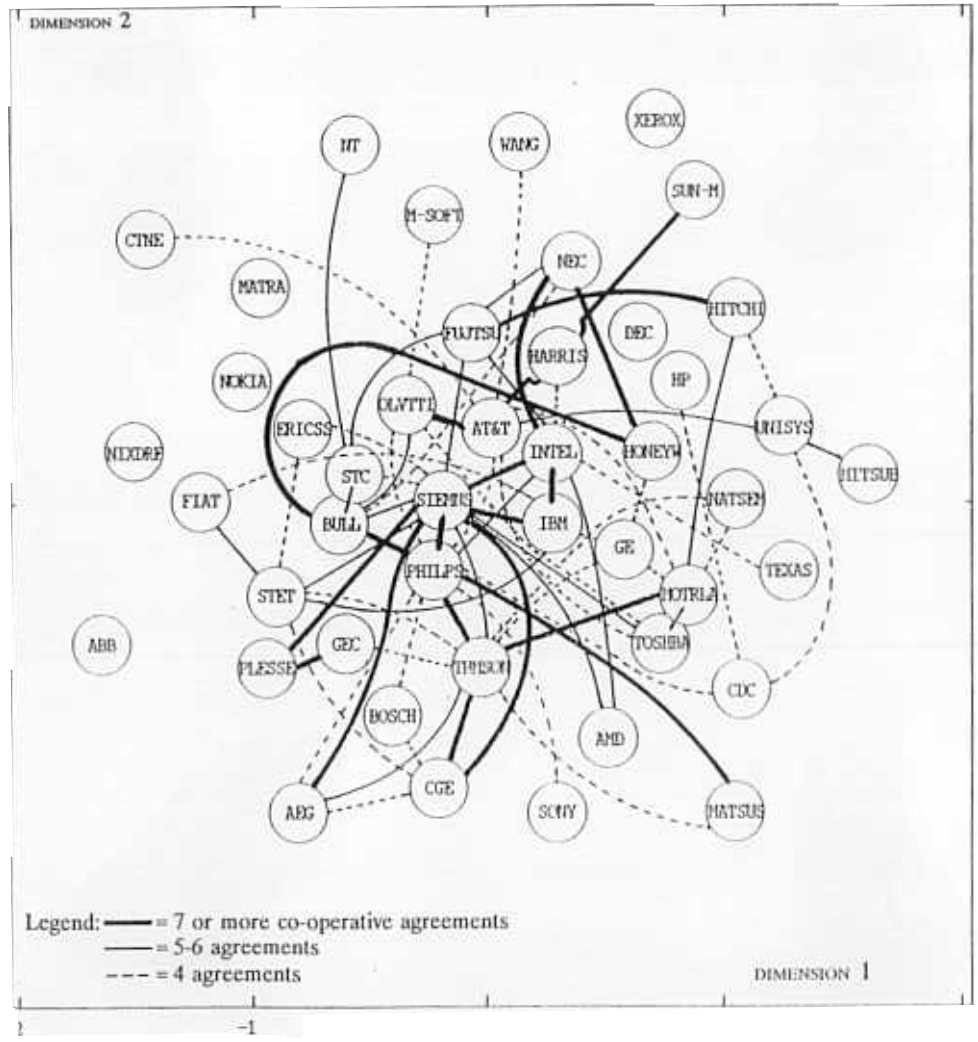
.....BUT MANY IMPLEMENTATIONS

A. A METHOD FOR SHARING R.D. EXPENDITURES AND RISKS IN HIGH TECH SECTORS.

*** IN INFORMATION TECHNOLOGIES**



*** IN BIO-TECHNOLOGY**



Source : HAGEDOORN J., SCHAKENRAAD J. (1990), p. 183 et 184.

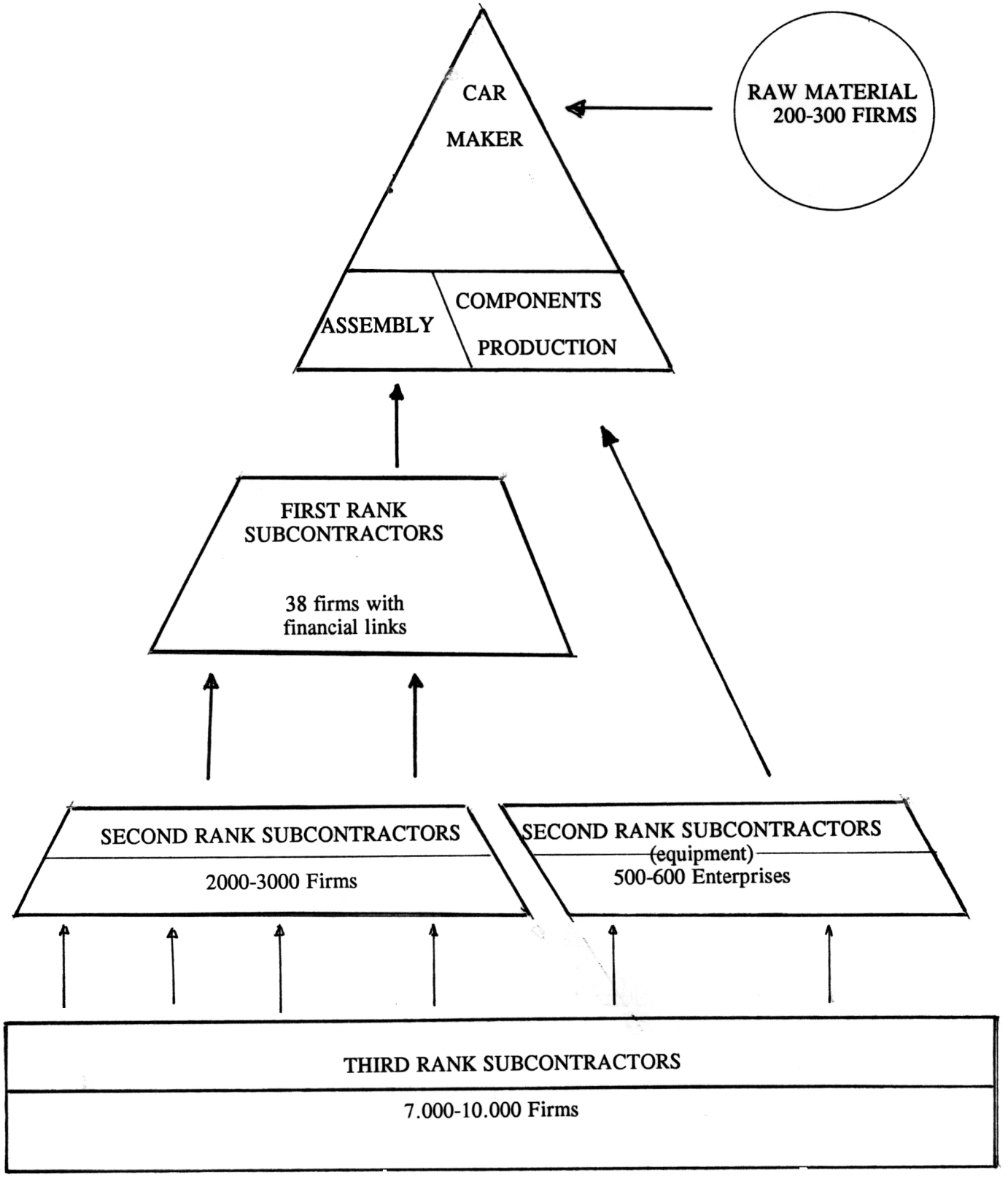
30. *Networking and joint ventures* (P7) define a seventh feature. During the Sixties, vertical integration, eventually mitigated by circles of subcontracting, was the usual way to reap dynamic increasing returns to scale associated with R & D expenditures, high fixed investment costs and learning by doing. The configuration has progressively evolved under the pressures of the rising instability and the stiffening of competition during the Seventies and Eighties. First, even large firms are no more necessarily able to master the whole set of techniques needed in order to be efficient for their core business. For example, combining information processing and telecommunication completely shifted the boundaries between these two industries, inducing new joint ventures or struggles in order to get the control of the more crucial innovations. Simultaneously, a large uncertainty prevails as concerns the main features of the emerging new socio technical system. Even in mature industries such as car manufacturing, the electronisation of final and equipment goods call for genuine competence, to be brought into the enterprises via joint ventures, or networking in order to get the benefit from future innovations [IMAI, BABA (1989)]. Therefore, networking might be the code word of the Eighties [GUILHON (1991), BRESSAN (1990)]. With various configurations, this seems to be the emerging organizational structure of the more dynamic and innovative sectors at the international level (Figure 6A), as well as most of the Japanese manufacturing sectors (Figure 6B) or even Italian firms (Figure 12). Multinational firms themselves are evolving from a centralized hub towards an integrated network : every unit, whatever its specialization, has potential linkage with any other unit belonging to the same firm (Figure 6C). From a more theoretical point of view, networking is the contemporary method *for reaping both specialization and coordination gains.*

31. *Long run and cooperative subcontracting* (P8) is another consequence of the same trends, according which institutionalizing complementarities between firms might enhance their joint productivity. In the fordist era, subcontracting was used by large firms in order to cope with fluctuations in demand, and/or in order to keep oligopolistic pricing practices. During the last two decades, this has led to numerous banckruptcies of subcontractors and therefore a loss of know-how, since large firms giving orders were aiming at reducing their own unit costs. In the US, for example, the adverse evolution of machine tools producers seem to have been the consequence of arms length relations between producers and users, large and small firms [DERTOUZOS, LESTER and SOLOW (1989)]. A similar evolution took place in France : a harsh and short sighted subcontracting policy from large car manufacturers has finally led to a loss of competence and expertise from small and medium size firms [LAFONT, LEBORGNE and LIPIETZ (1982)]. Quite on the contrary, now the need for competent and innovative subcontractors is widely recognized and a new model is emerging : the key reference is again the Japanese organization for subcontracting. The larger firm commits itself to multi-year contracting and helps the subcontractors'modernization and their buying of modern electronic equipments. Some international comparative studies suggest that this long run and cooperative strategy brings better results than the short run minded and cost minimizing fordist strategies [LEBORGNE (1987), LEVINE and D'ANDREA TYSON (1990)].

32. *Less labour division within the firm* (P9) is similarly a key feature emerging from both the limits of fordism and the new opportunities opened up by information technologies [SHAIKEN (1985), PIORE (1988), IRION (1990)]. This might be, if confirmed by subsequent evolutions, a major change in long run trend of scientific management, if not a total novelty. Contrary to the conventional taylorist methods, now managers realize that a larger scope for the tasks allocated to each worker can allow larger productivity [DALLE;

FIGURE 6 (FOLLOWS)

B. NETWORKS : A WAY FOR COORDINATING COMPLEX MANUFACTURING PROCESSES.



Source : B. GUILHON (1990), p. 21

BOUNINE (1987)]. Production work is therefore combined with initiative in management at the shop floor level, for example in maintenance, repair, inventories and orders. Therefore, quality is improved, break-downs are more easily diagnosed and repaired, where some shop floor level management is now done by skilled workers and not by outside controllers or special maintenance workers. Larger global productivity, which results from better utilization of human abilities, is the best response to uncertainty and a major source of innovation. Consequently, one observes in many OECD countries a redefinition of the hierarchy of skills towards a reduction of the layers of middle management. This process is taking place within the most modern manufacturing system. In Japan, flexible manufacturing systems seem compatible with an upgrading of the skills of direct production workers, even if the movement is far from automatic [PRIES, TRINCZEK (1991)]. In former West Germany, with the introduction of numerical control and CAD, the task of programming has sometimes been shifted to production personnel : for sure it is a major novelty with respect to fordist principles, but the case does fit in the conventional conception of training in former West German manufacturing. In France too, numerical control machines bring a significant upward recomposition of the skills, which indirectly probably implies a wider job contents [d'IRIBARNE (1991)].

33. *On the job training and general education are experiencing a new alliance* (P10). The fordist system used to oppose on one side highly skilled technicians, engineers and managers with a high degree of general education, to a larger fraction of the labour force, mainly trained on the job, and with poor general education standards. The shift of manufacturing tasks from purely physical to preeminently intellectual and control activities calls for a fluent literacy and numeracy, even for typical blue collar workers. Similarly in many tertiary sectors, the computarization calls for fairly good abilities to master abstraction, routines and procedures...which use to be the logical outcome of a successful general education system. A converging set of evidence suggests that this balance is now shifting towards the need of an higher level of general education, for the larger part of blue and white collar workers [CERI-OCDE (1989)]. A larger polyvalence calls for initiative, commitment and a problem solving orientation, including blue collar workers in assembly-line [DANKBAAR (1988)]. Simultaneously, the performance of firms is more and more related to adequate behaviours and initiatives in order to bring an efficient decentralisation/centralisation of management and production [AOKI (1990)]. Therefore, learning by doing, learning by communicating with other workers or departments becomes a key factor. This feature fits into the general trends in the decline of low skilled jobs, quite evident for US in the long run (Figure 7). Microelectronics will probably support this tendency : in former West Germany, computer integrated manufacturing (CIM) has systematically decreased unskilled or semi-skilled work, and on the contrary, increased craftmen, technicians and engineers jobs [PRIES, TRINCZEK (1991)]. More generally the success of CIM turns out to be rather closely linked to the skills and commitment of the workers, in order to capture the learning by doing effect associated to such a sophiticated technology [MALY (1989), BADHAN and SCHALLOCK (1990)].

34. Consequently, *skills have to be enhanced, as a source of commitment, competence and productivity* (P11). Again, during the fordist era, the taylorist principles were implying that the engineers should conceive equipments and plants organization in order to minimize the skill content, by permanently downgrading the competence needed from blue workers. In the Eighties, the limits of these strategies have clearly been perceived by the managers [WATANABE (1990)]. Therefore, a new motto, more than a business fad, is emerging : the quality and commitment of workers are an essential component of the competitive edge

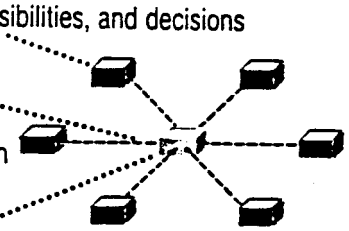
FIGURE 6 (FOLLOWS)

C. A METHOD FOR TRANSNATIONAL ORGANISATION

Corporate organisation

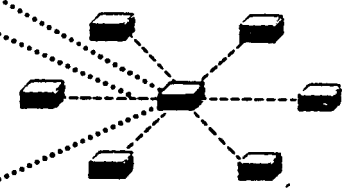
Multinational organisation model

Decentralised Federation
Many key assets, responsibilities, and decisions decentralised.
Personal Control
Informal HQ-sub relationships overlaid with simple financial controls.
Multinational Mentality
Management regards overseas operations as a portfolio of independent businesses.



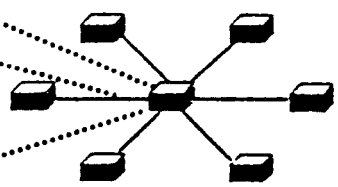
International organisation model

Coordinated Federations
Many assets, resources, responsibilities, and decisions still decentralised, but controlled from headquarters.
Administrative Control
Formal management planning and control systems allow tighter HQ-sub linkage.
International Mentality
Management regards overseas operations as appendages to a central domestic corporation.



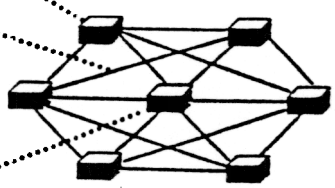
Global organisation model

Centralised Hub
Most strategic assets, resources, responsibilities, and decisions centralised.
Operational Control
Tight central control of decisions, resources, and information.
Global Mentality
Management treats overseas operations as delivery pipelines to a unified global market.



Transnational organisation model

Integrated Network
Distributed, specialised resources and capabilities.
Strategic Control
Coordination of flaws of products, resources and information across interdependent units.
Transnational Mentality
Management treats worldwide operations as an integrated and interdependent strategic whole.



Source : C. BARTLETT and S. GHOSHAL (1989) "The transnational : the company that wins in 1990", The Economist (1989), p. 97.

of the firm, sector or nation. This new principle is clearly at odds with the previous trends in labour management, and has tremendous consequences for labour markets, education, training and retraining. Maximize skills and then extract from them a continuously improving knowhow and competence [ABEGGLEN, STALK (1985)], might be one of the genuine feature of the J (or Japanese) Model investigated by AOKI (1988). Convincing analyses suggest that the Japanese job tenure in large firms is not only a legacy of Confucian or paternalistic values but a rational strategy given the important learning-by-doing effects and the importance of the support to the firm by the employees [KOIKE (1987)]. For example in this country, microelectronics usually brings a larger polyvalence of general production workers, who are now able to adpat and use existing programmes, eventually fix defective equipment and prepare work, while fulfilling surveillance of machine operation [WATANABE (1991)] : the upgrading of skill is evident. Even if traditionally the barriers between intellectual and manual work is far more important, the same evolution seems to take place in France [d'IRIBARNE (1990)].

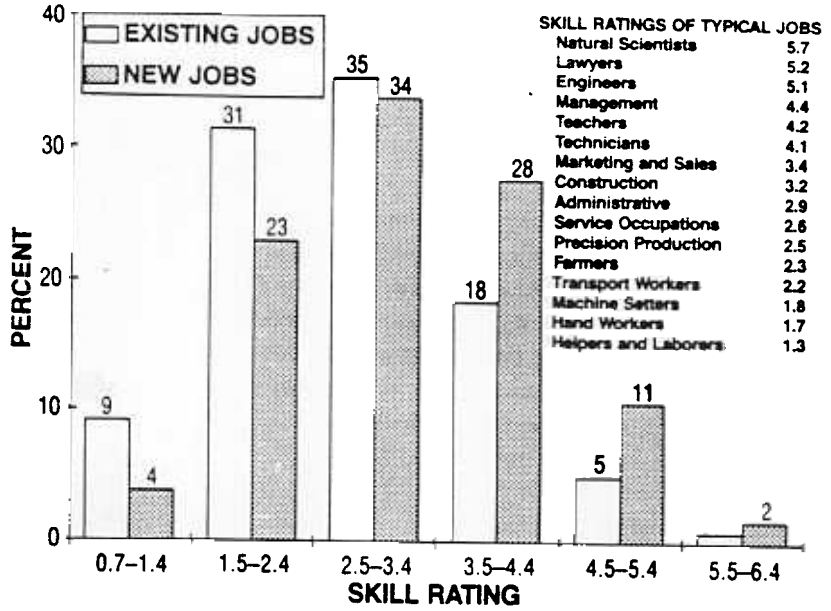
35. *More commitment means some advantages for wage -earners : good wages and/or longer job tenure* (P12). No doubt that this new model implies much more commitment from workers, as well as a broader scope for the tasks fulfilled by every one. This benefit cannot be obtained by the firm without any explicit advantage for wage earners. The theoretical analysis of Japanese firms by M. AOKI suggests that a principle of dynamic surplus sharing is needed in order to induce workers' consent. It can be fulfilled either by an explicit or a quasi job security, or by a wage formation rewarding individual commitment and linked to firm, sectoral or national achievements [BLINDER (1990)]. Main OECD countries exhibit various mixes for these two kinds of benefits. In the long run, this is a quite important topic indeed for the viability of such a new management style, since one cannot imagine well educated, strongly committed workers being under-paid and frequently laid off at cyclical down-turns. Such a new compromise is not so easy to negotiate for countries in which adversarial industrial relations are part of a long lasting tradition [HASHIMOTO (1990)]. The opportunities of a purely defensive strategy are not without appeal, specially when unions are disoriented and declining in memberships and initiatives. Nevertheless, most experts in US now realize how essential such a new compromise is : commitment and polyvalence via training versus a kind of employment stability [DERTOUZOS, LESTER, SOLOW (1989), BROWN, REICH, STERN (1990), OSTERMAN (1988)]. The Japanese managers [WATANABE (1990)] and experts [SHIMADA (1990)] stress the consequence of new principles and the information technologies upon human resources management and consequently capital labour relations [NOMURA (1985)] (Table 5). German and Swedish cases suggest that strong unions and a continuous process of negociation might enhance the diffusion of new technologies [BUECHTEMANN (1991)]. It was a key message from the SUNDQVIST report [OECD (1988)]; it is seemingly confirmed by the synthetic analysis provided by Table 15 which will be documented more throughtly subsequently.

III - COHERENCE. SIGNIFICANCE AND GENERALITY OF THE NEW MODEL

36. Till now, the description has been quite idealistic and rosy indeed. It is time to introduce some flesh around this skeleton and give a short account of all the debates raised by this new thinking which tends to be conventional wisdom in the early Nineties. Is the model totally new ? Are the present changes transitory or structural ? In practice, is this model really better than typical fordism ? Will it apply to most manufacturing sectors, and

FIGURE 7 : LOW SKILLED JOBS ARE DECLINING

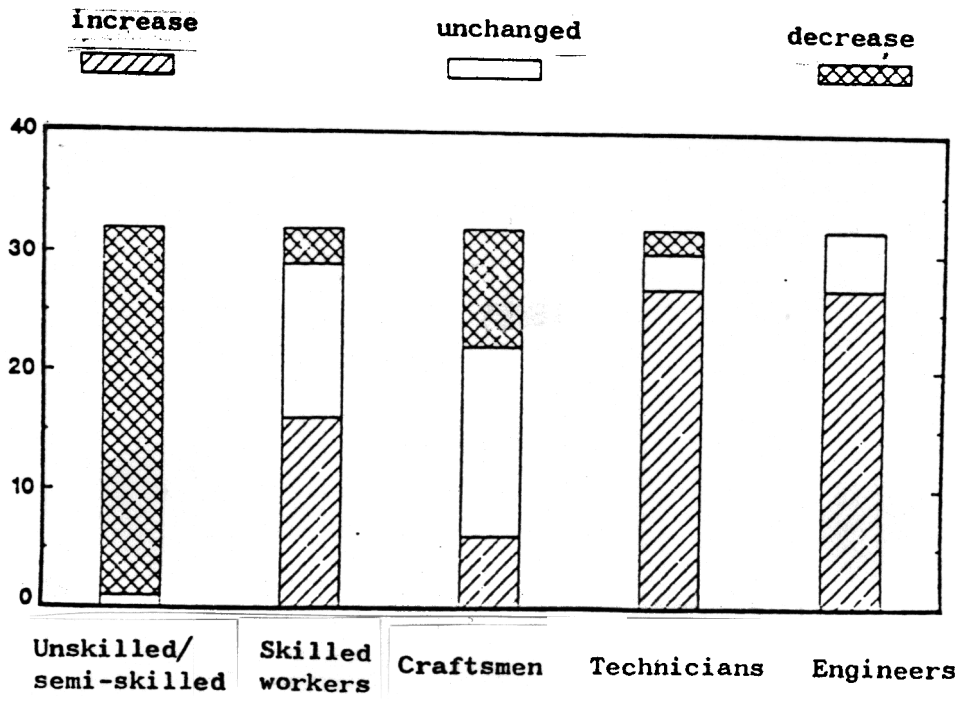
THE EXAMPLE OF U.S.



Source : Hudson Institute, Taken from "Made in America", p. 100.

FIGURE 8 : A COMFIRMATION : THE TRANSITION TO CIM

FORMER WEST GERMANY



Source : L. PRIES and R. TRINCZEK (1989), p. Appendix

does it fit with the continuous rise of the service economy ? Can small and medium size firms implement the twelve new principles ? Is the previous description not to closely related to only one key model that of the J firms, or does it apply to a larger variety of countries ? A huge literature deals with these issues. Let us focus upon the statements and assessments of the authors of the five national country reports.

§1. RUPTURES AND CONTINUTIES WITH FORDISM.

37. Japanese managers and academics frequently stress how faithful to scientific management principles their manufacturing sector has always been. After all global optimization (Pl) was at the core of the first assembly line in Henry FORD's factories. Quality control and zero defect were first proposed as key objectives by American engineers and managers...but only taken seriously by Japanese firms. Similarly, the full integration of research development, production and marketing keeps in line with the general trends towards rationalization and pushes it one or two steps forward. The J Model would only be an adaptation of the A (i.e. American) or the H (for hierarchical) Model, given the new opportunities provided by the evolution of technologies, markets and the forms of competition [AOKI (1990)]. For example, reviewing the reasons of the success of the NUMMI TOYOTA plant in California, ADLER (1991), states that "It is taylorism intelligently applied". Similarly an analysis of the strategy of the Ford enterprise in Europe brings the conclusion of significant continuities and inertias between the old and the new principles [BELIS-BERGOUIGNAN, BORDENAVE, LUNG (1990)]

38. The German report provides the same general feeling, about a rather large continuity. If for example information technologies open a corridor along which skill distribution could evolve, they will probably reinforce the existing institutionnal system about vocational training, firms organization and the division of labour [PRIES and TRINCZEK (1991)]. Similarly, the domination of technical objectives will probably hinder the emergence of alternative models, based more on skills and less on technologies and equipments. At a more general level, *flexibilityautomated flow production* would be a mere modernisation of the conventional German flexible production. Even the Swedish report emphasises the ongoing domination of very tayloristic methods. In spite of very early attempts to overcome the crisis of work ethics [AUER, RIEGLER (1990)], the objective of workers democracy and integrated qualified team work is still far ahead [ROOBEEK (1991)].

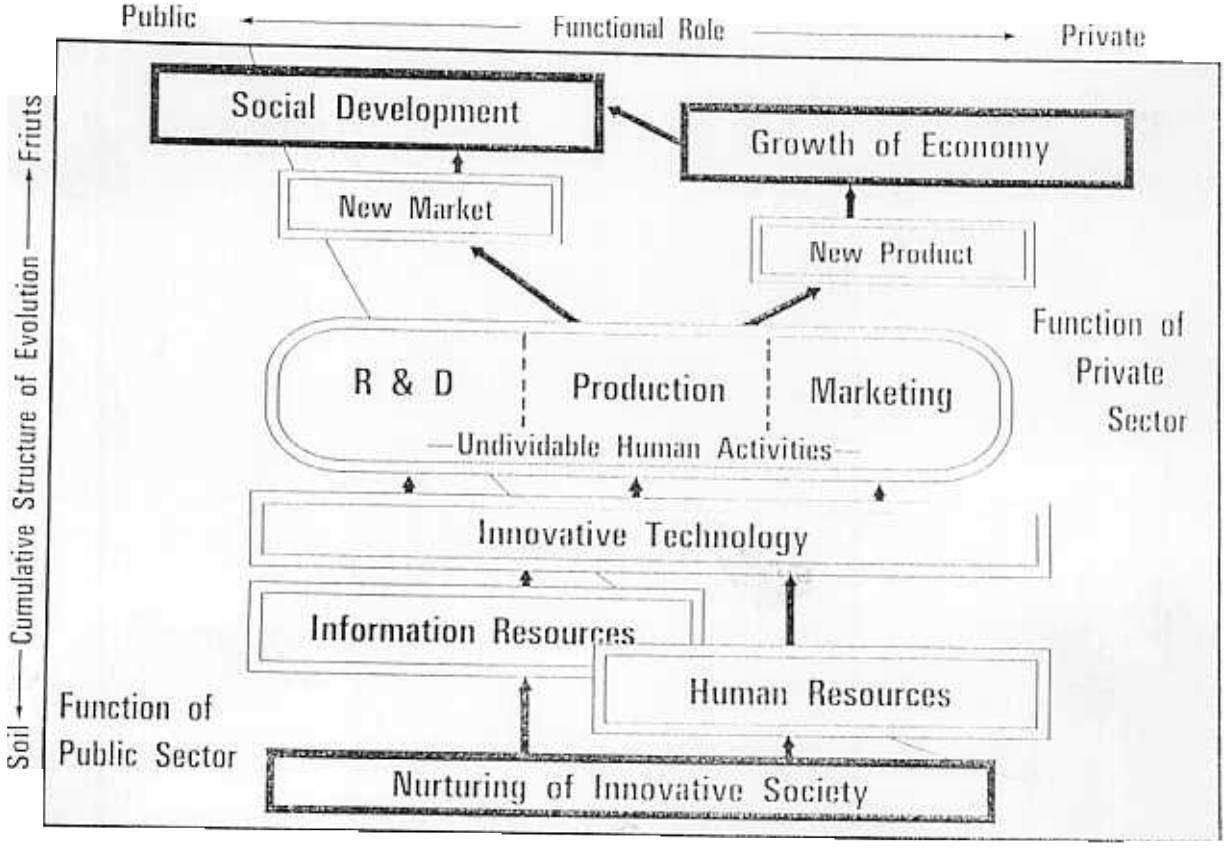
39. These views are welcome, since they counterbalance a common fad about the speed and far reaching consequences of the new model. Often, verbal support to the new model is more frequent than any effective implementation. In France for example, D'IRIBARNE (1989), (1991) underlines how much the new management style is admired and aimed at...in the very society which probably has the more difficulties in implementing it (table 15). Nevertheless, it might be erroneous to conclude that "there is nothing new under the sun". Just looking at Table 3, it is clear that some of the basic Fordist principles are at odds with the emerging model, which for convenience could be labelled as Toyotism, i.e. scientific management cleverly applied to mass production of diversified and quality goods. Vertical integration is replaced by networking (P7 versus F7), downgrading of productive tasks by their upgrading (P9 versus F9), previously disconnected functions are now linked (P2 vs F2), general education is to be maximized and no more minimized (P10 vs F10). But, of course, one can diagnose a continuity between global (P1) and partial

THE NEW MODEL DRAWS BASICALLY ON HUMAN RESOURCES AND KNOWLEDGE

TABLE 5.A : EVOLUTION OF INDUSTRY HUMAN-DIMENSIONAL ASPECTS

Industry \ Era		"Taylorism"	"Post-Taylorism"
Mode		Manufacturing	Knowledge-Intensive
Organi-zation	Disciplinary	Vertical (Order-obedience relation)	Horizontal (Persuasion-consent relation)
	Information	One-way (Tree-structure)	Multi-way (Network-structure)
Source of Value Creation		Capital goods	"Information ✙ Human"
Ideology		"Goods-capitalism"	"Knowledge-capitalism

TABLE 5.B : ROLE OF HUMAN INFORMATION RESOURCES FOR ECONOMIC GROWTH



Source : WATANABE H. (1991)

optimization (P2) and similarly, to get peaceful and harmonious industrial relations was the dream of W. TAYLOR, Henry FORD and their followers (P12 in the continuity of F12).

40. More generally, it might be enligthening to put these new emerging principles in the historical perspective of industrial dynamics and rationalization of production (Table 6). Since the first industrial revolution which took place in England, each epoch has exhibited definite features for division of labour, mechanization, the sources of process and product innovations. Consequently, the American system has put emphasis upon standardization and mass production, i.e. a novelty with respect to the British manufacturing system [HOUNSHELL (1984)]. Similarly, the invention of assembly-line by fordism delivers a new impetus to mechanization and mass production and productivity (Figure 9). Each stage is built upon organizational or technological innovations [AYRES (1990)]. For example, the new flexible manufacturing era, let it be flexible specialization or diversified and quality mass production, is built upon a new synergy between *economies of scope*, quick responses to market and to a large extent a renewal of *economies of scale*.

41. Nevertheless, some major continuities seem to prevail all over two centuries of industrialization and technical change. First of all, a rational analysis is applied to changing contexts for markets, technologies, values and skills : in each case, the new principles are deriving not only from a new vision of the world (remember the 5 $ a day by Henry FORD) but from a careful analysis by craftmen, ingeneers and scientists : TAYLOR, FORD and OHNO clearly belong to the same tradition. A second feature of each model is precisely to deliver significant and continuous sources for productivity increases...or quality improvement for a given price. Under this respect, the new principles of the Nineties do fit into the general trends of scientific organization and management [AYRES (1990)].

42. Therefore, elaborating a new management style has always drawn from previous experiences, either positively or negatively. Nevertheless the English manufacturing system was not equivalent to the American mass production. In turn taylorist methods and aims took a new configuration under fordism. Similarly, all the transformations previously described do delineate a new configuration for management, work organization and industrial relations, in reponse to a new shift in the socio-economic system [FREEMAN (1989)]. It would be therefore erroneous to argue for a complete continuity between the J and A Models : the subsequent comparisons of Japanese and American configurations (Table 9) and performances (Tables 10 and 11) strongly contradict the general hypothesis of a strict identity of the two models.

§2. TRANSITORY TURBULENCES...OR LONG RANGE STRUCTURAL TRANSFORMATIONS ?

43. The significance of contemporary transformations has been questioned by academics and researchers. According to one interpretation, the need for technical flexibility would be generated by the demise of fordist system, the rising uncertainties and recurring large and unexpected economic fluctuations observed during the Seventies [PIORE, SABEL (1984), HIRST (1989), TOLLIDAY, ZEITLIN (1991)]. But if by international economic policy coordination, the firms'environment could be stabilized and growth rate recover, then the need for flexible production would decline [BOYER (1991b)]. Simultaneously the search for multiskilled workers would be the equivalent of an insurance premium : given

TABLE 6 : THE NEW PRINCIPLES IN HISTORICAL PERSPECTIVE.

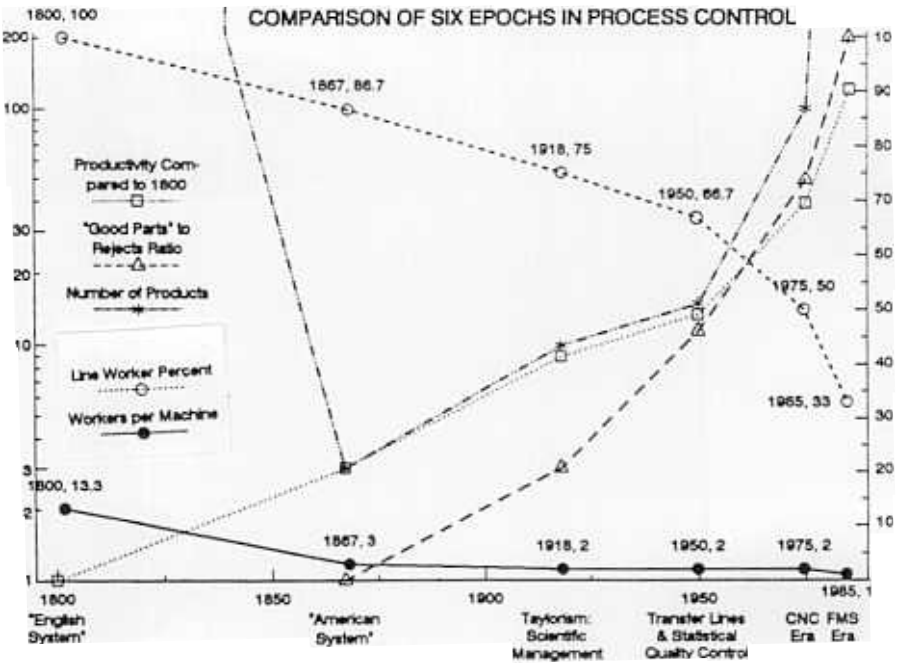
PRODUCTIVE SYSTEMS / FEATURES	MANUFACTURE	AMERICAN SYSTEM	TAYLORISM	FORDISM	FLEXIBLE SPECIALIZATION	DIVERSIFIED MASS PRODUCTION
1. Division of Labour	1. Both within and outside the firm	1. Between low and high skills	1. Separation conception / execution	1. Deepening of taylorism	1. More polyvalence of workers	1. Partial recomposition of production, maintenance, shop floor management
2. Mechanization	2. Replace work by machines	2. Specialized equipment	2. Rationalisation in the use of equipment	2. Assembly line	2. Electronized equipment	2. Programable equipment
3. Technical Change	3. Learning by doing	3. Engineering	3. Time and motion	3. Via mechanization	3. More flexible equipments	3. Generic equipment and team work
4. Products	4. Diversified	4. Standardized products	4. Mainly standardized products	4. Minor diversification of products (from Ford T to annual model change)	4. Diversified low volu- production	4. Quality differentiated mass production
INNOVATIONS	5. Replacement of craftmen by wage earning population	5. Incorporation of low skilled workers	5. Destruction of previous crafmanship knowledge	5. Direct control of working time by the assembly line	5. Economies of scope rather than economies of scale	5. Combine economies of scale and scope
	6. Internal large division of labour	6. Standardization of components	6. Rationalisation of equipments	6. Genuine compromise with wage-earners	6. Workers expertise and commitment	6. More workers continuous learning by doing
CONTINUITIES / DISCONTINUITIES						
7. Reduction of costs	7. Large	7. Large	7. Large	7. Very large	7. Possible but not necessarily cumulative	7. Significant with quality improvement
8. Differentiation of product	8. Lower than for craft production	8. Still lower for components	8. No clear change	8. Initially reduced and then minor enlargement	8. Very large	8. Rather large at least potentially
9. Geographical extension	9. Limited (role of the putting out system) and growing	9. Limited and then growing	9. Growing but some obstacles	9. Rather large after WWII	9. Still very limited	9. Rather limited, but growing

the large uncertainty about future job stratification, it is better for firm to hire polyvalent workers in order to be sure that they will fit into the final requisite for the emerging technological system. For example it has been shown, that educated workers help in implementing new technologies, by speeding up the learning process and enhancing the adoption of new routines or procedures [BARTEL and LICHTENBERG (1987)]. The Japanese studies about the impact of macroelectronics upon labour division seemingly confirms this hypothesis [WATANABE (1991)]. Initially, a lot of outside and inhouse engineering is required, but during a second phase, general production workers can fulfil some of the programming maintainance and the management tasks. Nevertheless, all the five national studies confirm the absolute or relative destruction of low skill jobs and the large increases in the employment for medium of high skills (Figures 7 and 8). These long run trends are still reinforced for flexible manufacturing systems and Computer Integrated Manufacturing [MALY (1989), BADHAM, MATHEWS (1989)] (Figure 9).

44. Therefore the need for better educated workers would continue to increase but probably at a lower rate, as time elapses and allows a better knowledge in the new principles in labour division, slightly reducing the initial burst concerning engineers and technicians. This prognosis could be substantiated by another major finding of modern labour market theories. In Europe for example, the level of education has been used as a screening device in order to select the more able from a pool of young workers and/or unemployed people [SPENCE (1973)]. If unemployment was decreasing, such a selectivity would probably decline, firms adapting themselves to an emerging scarcity of workers. In the United States for example, a rather low vocational training does not seem to have prevented the exceptional job creation observed for a decade. A final argument could support the previous diagnosis about the transitory character of the evolution observed in the Eighties. The information technologies would need initially a lot of highly skilled work in order to conceive the hardware, to write the related programmes, and finally adapt one with the other. When this process will have converged, it will possibly need more routinized work from production employees, reducing the initial strains upon vocational and educational systems. This was the view expressed by GRILICHES (1989) in his controversy with FREEMAN (1989) during the OECD Conference about "Science, Technology and Growth".

45. This prognosis has been criticized. For example, comparing the contemporary transformations with what occured during the interwar period, suggests a renewal and deepening of long run tendencies affecting economic and technical system [HOUNSHELL (1984)]. In the Twenties, the relative exhaustion of a totally standardized production (the Ford T was unchanged for two decades) the stiffening of competition and the new demand of consumers for more differenciated cars, led to the emergence of the General Motors management style : annual model change, flexible assembly line, multipication of subcontractors, final differentiated goods obtained by combining highly standardized components. This management model replaced the initial fordist one, and exerted a long lasting influence upon managerial organization. Mutatis mutandis, the Seventies and Eighties experience a similar process, where information technologies may help in pushing a step forward the differentiation of mass production [JONES (1988)]. Consider this example : the run of Ford T unchanged model was about eight millions, that of a successfull GM car around several hundred thousands. Nowadays, some highly flexible Japanese firms run batches around one thousand or several hundreds [AOKI (1988)]. No doubt that the competitive edge gained by these firms has exerted a strong pressure upon

FIGURE 9 : COMPARISON OF SIX EPOCHS IN PROCESS CONTROL



Source R. AYRES (1990), p. 20.

more rigid fordist methods. Look for example at the relative evolution of American and Japanese car makers . It should be remembered that quality and mass production, flexibility and productivity can now be reaped simultaneously (Table 4.C). Consequently why to return to the older and inferior system ?

46. Similarly, the *general trend towards higher education* is observed worldwide, with an intuitlve correlation between the speed of implementation of new technologies and the general level of education of a country [BENGTSSON (1989)]. It has been convincingly argued that the successfull four dragons in South Asia did benefit from their large educational efforts after WWII. On the contrary, a poor educational system seems to drag upon the industrialization process, even in countries with abundant natural resources and productive investment [AZARIADIS and DRAZEN (1988)]. Within OECD countries, the role of educatlon appears as more and more relevant in the implementation of new technologies, and economic performances (Table 7). The more successful countries, Japan, former West Germany and Sweden do exhibit the larger part of employment for workers with more than a secondary education. Still more, combined with active employment policy, such a feature seems at the core of the Swedish model, in for example discriminating the role of unemployment among low and high skilled workers.

47. The SUNDQVIST report [OECD (1988)] has pointed out that "knowledge work is now the larger source for productivity increases". The investment in human and immaterial capital is actually out-running the volume in material productive investment, at least in the manufacturing sectors [ELIASSON (1989), EDQUIST and GLIMELL (1991)]. Moreover, it has been convincingly shown that information technologies, by their very nature, call for more intellectual work and the control, which replaces the previous criteria of physical abilities. Consequently, investing in skill formation is now more and more essential for technical and economic efficiency. Some sophisticated econometric studies have show that the effective composition of labour force, for example the share of technicians and engineers explains more productivity differentials between firms than the more conventional variables such as material capital and even RD expenditures (Table 8). Investment in human capital, a key feature of a new model, is very likely to continue even after the transitional period out of the fordist management style.

§3. IS THE NEW MODEL BASICALLY SUPERIOR ?

48. A third objection is now addressed. In managerial theory discussions, it is now fashionable to adopt a very positive view concerning the superiority of the J Model over the A Model. For example, many OECD conferences about the Technology Economy Programme, have shown surprising convergences between managers, consultants, economists and social scientists about the main features of the new management style. Similarly, that used to be perceived initially as a genuine Japanese feature has now spread all over the world from Europe to North America. For example a recent survey about American car manufacturers has delivered an impressive consensus about the characteristics of a successful company in the year 2000 : "more responsive to consumers, which means frequent model changes, shorter model life-cycles and smaller production runs. Its employees will be more flexible and better educated. It will enter into long term partnership with suppliance" [THE ECONOMIST (1991)] But in actual practices, does its implementation lead to better results for the firms, the wage earners and the national economy ? In the early Eighties, only partial evidence was available, which usually led to

TABLE 7 : THE ROLE OF EDUCATION IN TECHNICAL CHANGE AND ECONOMIC PERFORMANCE

COUNTRIES / 1988 or 1987 / INDEXES	FRANCE	JAPAN	SWEDEN	UNITED STATES	WEST-GERMANY
1. Differential unemployment rate (low skilled/average)	n a	n a	1,17	1,9	2,08
2. Part of employment,with less than secondary education :					
. Whole economy		29,2	44,1	16,4	22,5
. Manufacturing		32,1	50,1	20,6	26,9
. Ratio manufacturing/whole.		1,10	1,14	1,26	1,20
3. Active public spending for employment/GNP	0,8	0,2	1,9	0,3	1,0
4. Fraction of active employment policies in total public spending for employment	26 %	29 %	71 %	32 %	42 %
5. Vocational training/GNP (per cent)	0,28	0,03	0,55	0,11	0,32
6. Share of employed with university level	n a	14,5	11,0	23,4	6,3

Sources 1. : OECD (1989), p. 93.
2. : OECD (1989), p. 210.
3 to 6 : OECD (1989 "Employment Outlook, p. 222-223

careful prognosis. But in the early Nineties, many evidences are adding up into a firmer if not definitive assessment of the potential of the new model.

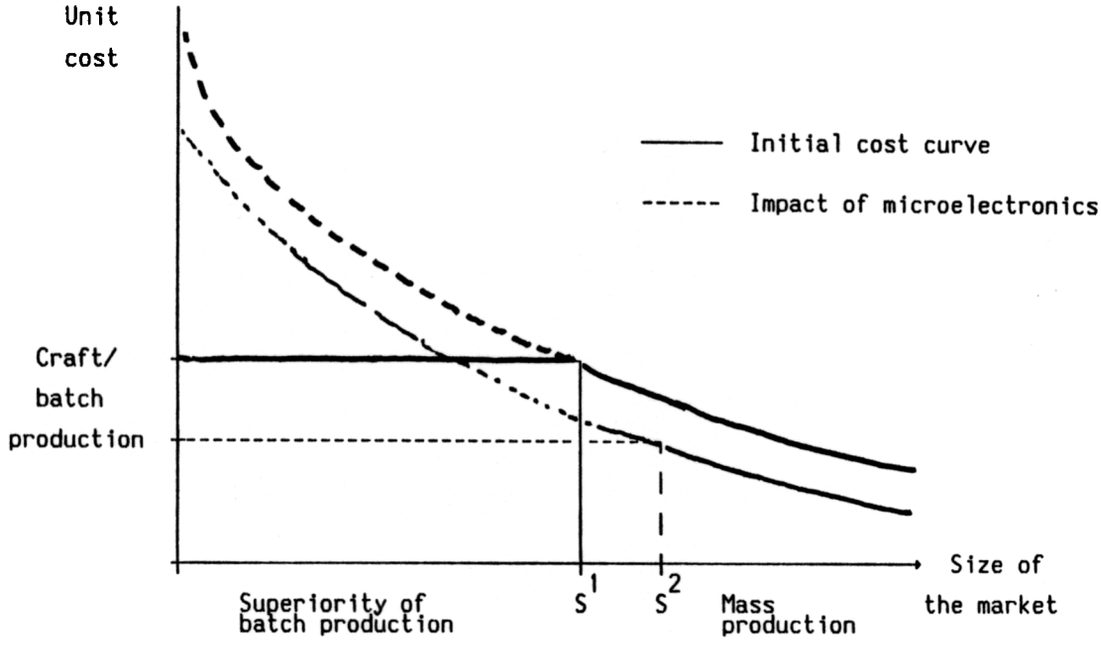
49. In the mid Eighties, *flexible specialisation* was proposed as the likely follower to fordist mass production, by authors such as PIORE and SABEL (1984). In retrospect, their views have to be confronted by an alternative explanation or hypothesis about the trend towards *flexible mass production of differentiated quality goods* [BOYER, CORIAT (1986)]. Firstly, the exceptional duration of the American boom initiated after 1983 has reduced the concern for fluctuating and uncertain demands : technical flexibility is slighty less needed than during the Seventies. Secondly, micro-electronics was supposed to benefit in batch production of differentiated goods, due to the lowering of the cost associated with model changes manufacturing (Figure 10). Of course, small and medium firms have regained strength and dynamism via an adequate specialisation [SENGENBERGER, LOVEMAN (1987)]. Accordingly, some Italian firms, more or less organized in industrial districts structured by flexible specialization, have experienced impressive successes during the Eighties, even in the most conventional manufacturing sectors [CHEVALIER (1991)].

50. Nevertheless, mass production of standardized product still characterizes components and intermediate products. In a sense, this is the deepening of the general trends towards product differentiation, present even within the American manufacturing system (Table 6). Thirdly, the long boom from 1984 to 1989 has brought back a major concern for dynamic efficiency, i.e. productivity increases and quality improvement, and not so much static efficiency i.e. the flexibility of the production process with respect to unexpected disturbances. Fourthly and consequently, increasing returns to scale do not seem to have vanished, quite on the contrary [AYRES (1985)] : given the huge costs in R & D expenditures, investment, networks and servicing, even the most recent micro-electronic products do exhibit higher increasing returns to scale than traditfonal mechanical products, such as the Ford T (Figure 11). This is confirmed by a detailled investigation about the origins of the success of the Japanese firms [ABEGGLEN, STALK (1985)].

51. This would imply that *economies of scale and economies of scope* are to be combined within the new principles and that consequently differentiated mass production is more likely to set the pace of the new industrialisation pattern than the flexible specialisation model. Of course, one may find in Italy (Emilia Romana) or in Germany (Bad Wurtenberg) or even in Sweden (the car industry) successful example of this second model. Nevertheless, the more impressive transformations within OECD countries seem instead related to flexible automation. For example, in United Kingdom, the national producers of consumer electronics have quasi totally been replaced by subsidiaries of Japanese multinationals [CAWSON (1989)]. An unbalanced and the flawed fordist model has been overcome by the new J Model of flexible mass production. Similarly, the comparisons between American car manufacturers and the recent plants reorganized by US based Japanese multinationals, significantly stress the large superiority of the second over the former [ADLER (1991)]. The superiority is reached not that much by investing more in productive capital, but in reorganizing the continuity of productive flows, negociating a new configuration for industrial relations and obtaining commitment and productivity from employees. For example, a comparison of the SATURN project with the NUMMI plant [THE ECONOMIST (1991)], both belonging to General Motors clearly shows the superiority of the new model and the danger of an overinvestment into a mere technological modernization of fordism (Table 9).

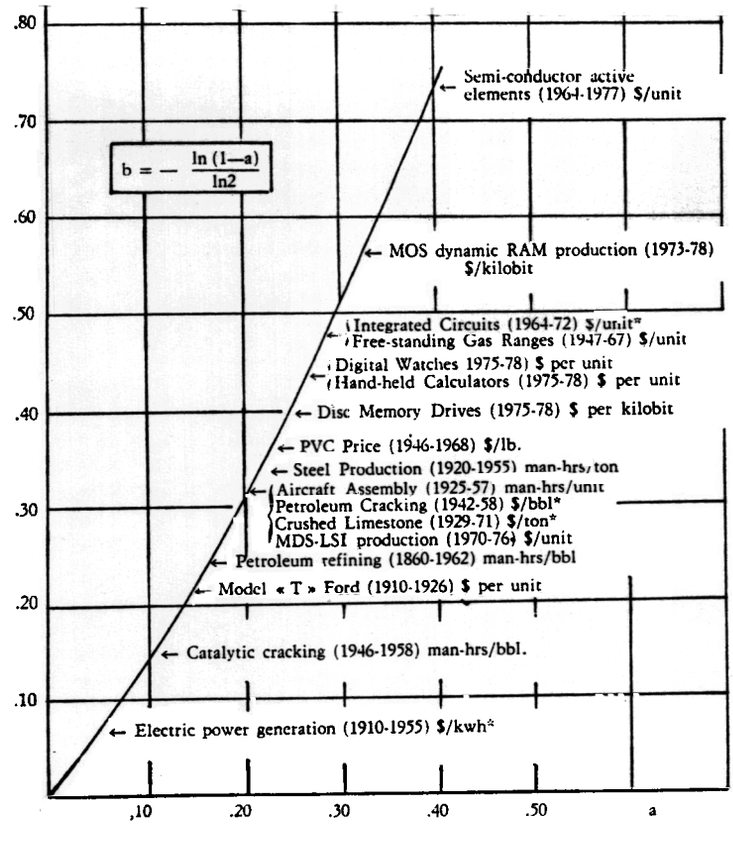
THE INITIAL EXPECTATIONS :
A DECLINE IN INCREASING RETURNS TO SCALE DUE TO INFORMATION TECHNOLOGIES

FIGURE 10 : M. PIORE AND C. SABEL'S INITIAL HYPOTHESIS



Under the impact of microelectronics, craft and batch production should gain market shares, mass production should relatively decline.

FIGURE 11 : THE EFFECTIVE INCREASING RETURNS TO SCALE HAVE NOT DECLINED



* Parameters of the experience curve for various industries.

Source: Robert U. Ayres (1985), p. 379.

52. These are precisely the key ingedients of the emerging management model. "Organisation counts more productivity than micro-electronics per se" : this statement by WATANABE (1991), could be a motto for the Nineties. This does not mean that new electronic devices cannot still enhance productivity and quality. Some analysts expect a new burst in the Japanese competitive edge when new technologies will systematically be applied to manufacturing [VALERY (1989)] and the services [CAULKIN (1989)]. But conversely, deficient productive flows and adversarial capital labour relations are rarely cured by purely technical devices [LAZONICK (1990)]. The high-tech strategy of some American manufacturers and their rather disappointing results are a clear example of the importance of organizational innovation [BURTON (1990), LEVINE, D'ANDREA TYSON (1990)]. But the various components of the new principles cannot be implemented separately without loosing much of their global advantages. Cases studies show that the strong complementarities between job security, employee involvement and training make difficult any transition away from conventional management based upon job classifications, adversarial relations and minimal training [BROWN, REICH , STERN (1990)]. This might explain why the potential efficiency of the new model remains hidden, due to partial or unadequate implementation.

53. Does this superiority show up in a systematic comparison of firms belonging to the same sectors but which have adopted different but *coherent strategies* ? A series of French studies suggest a positive answer even if it is rather difficult to disentangle all the factors explaining relative growth and performance of firms (Figure 3). CHOFFEL, CUNEO and KRAMARZ (1988) provide many hints. First, small and medium sized firms, when highly skilled, were able to turn from the home market towards exports, whereas when competence and skills were low, they have been loosing market shares and industrial jobs. Second, the large fordist exporting firms, for example in the car industry, which have followed a low skilled and low tech strategy, have finally incurred severe job losses. Third, and conversely, the firms belonging to the same sectors which have reversed their taylorist management, have stabilized their employment level. The results are interesting indeed, since it has to be recalled that France is far from being at the forefront in the implementation of the new model (Table 15).

54. But the more impressive examples might relate to a comparaison between Japanese firms in Japan, Japanese transplants in America, American producers in the United States and finally European producers, again for the same car industry. In the Seventies, it could be thought that the superiority of the Japanese plants with respect to the American ones was linked to a series of factors specific to the Japanese society : low wages and social benefits, long hours worked, protection of the domestic market. Nevertheless, the productivity of the assembly-line, once corrected for the size of the car, was definitely superior for TOYO KOGYO compared to FORD [ABERNATHY, CLARK, KANTROW (1985)] (Table 11). Still more, during the Seventies, productivity was increasing fast for Japanese firm automakers, but quasi-stagnating in the United States (Figure 12B). A decade later, the gap has not totally been closed, since productivity is far superior in Japanese managed firms than for American plants (Table 10). Therefore, this is not a purely cultural phenomenon, due for example to the fact that Japanese would be work addicts and are less adversarial, but the outcome of a different management style. This is clearly documented by the surprising and impressive success of Japanese transplants in United States, but as well United Kingdom, even if it is somehow premature to have a definite assessment [WOOD (1990), HIRATA (1990)].

TABLE 8 : SKILLED EMPLOYEES ARE AS IMPORTANT AS RD EFFORT IN EXPLAINING INDIVIDUAL PERFORMANCES OF FIRMS

FRENCE : THE RESULTS FROM AN ECONOMETRIC STUDY ON PANEL

EXPLAINING VARIABLE / EQUATION	ℓ	m	c	TING	TTERT	TTEC	TMAIT	TMECA	TOQ	R^2 [MSE]
SALES	0,32 (0,02)	0,58 (0,01)	0,09 (0,01)	-	-	-	-	-		0,99 (0,015)
	0,34 (0,01)	0,56 (0,01)	0,08 (0,01)	1,02 (0,24)	0,24 (0,05)	-0,02 (0,14)	0,58 (0,25)	0,06 (0,04)	0,07 (0,07)	0,99 (0,013)
	0,34 (0,02)	0,56 (0,01)	0,09 (0,01)	0,90 (0,20)	0,17 (0,05)	-	-	-	-	0,99 (0,014)
VALUE ADDED	0,76 (0,03)	-	0,23 (0,02)	-	-	-	-	-	-	0,96 (0,055)
	0,81 (0,02)	-	0,18 (0,02)	2,21 (0,41)	0,60 (0,10)	0,30 (0,25)	0,57 (0,44)	0,07 (0,06)	0,26 (0,12)	0,97 (0,041)
	0,79 (0,03)	-	0,19 (0,02)	2,34 (0,35)	0,52 (0,09)	-	-	-	-	0,97 (0,041)
GROWTH PROFIT	-	-	0,83 (0,05)	-	-	-	-	-	-	0,50 (1,397)
	-	-	0,79 (0,05)	2,87 (2,39)	-0,57 0,56	0,20 (1,46)	-4,21 (2,58)	-0,56 (0,45)	0,23 (0,71)	0,51 (1,357)
	-	-	0,82 (0,05)	3,42 (2,12)	0,07 0,51	-	-	-	-	0,51 (1,355)

ℓ	Log Employment
m	Log intermediate product
c	Log material capital
TING	Proportion of engineers
TTERT	" " administrative clerk
TTEC	" " technicians
TMAIT	" " foremen
TMECA	" " mechanicians
TOQ	" " skilled blue collar workers

Source : M. SASSENOU (1988) "R-D et productivité dans les entreprises Japonaises: une étude économétrique sur données de panel", Thèse de Doctorat en Analyse et Politique Economiques, Econométrie Appliquée, Paris, December. p. 297.

55. After all, it is not a total surprise if the market share of the Japanese firms are climbing up, whereas General Motors undergoes a continuous decline since two decades (Figure 12A). In fact, the new prinicples do not rely any more upon a trade off between productivity and flexibility, but on the contrary they provide more productivity, less absenteism, less stocks, more versatility, without supposing large extra-costs for investment and equipment (Table 10). These results are not specific to the car industry, since they apply seemingly to most of the electronic industry. Thus, the Deutch company PHILIPS has undergone more severe problems than SONY and MATSUSHITA : the large inertia of the internal organization of the firm, specially the total centralization of product division, has played a key, if not exclusive role [THE ECONOMIST (1990)]. Similarly the consumer durables electronic sector has basically vanished in United Kingdom, due to unadequate management and bad organization, whereas the Japanese transplants have brought the new principles...and consequently a significant recovery of this depressed industry [CAWSON (1988)].

56. The same question has to be addressed for regions and nations [PORTER (1990)] : do they fare better in terms of employment and competitiveness, when they implement the new management style ? Many recent investigations tentatively give a positive answer. LEBORGNE, LIPIETZ (1987) contrast within Europe two broad regions : where a new compromise has been negociated with workers, the transition out of fordism has been fast enough to build a competitive edge and promote job creation ; on the contrary, the regions or nations who stick to their tayloristic and fordist strategies are suffering from disindustrialization and low growth [SABEL (1988)]. Finally, much researches about the Single European Market of 1992 stress the role of market integration upon the stimulation of competition, therefore innovations, provided sufficient resources in skilled workers is forthcoming [Economie Européenne (1988)]. Our own investigation, based on the five countries under review suggests some links between the new management model, the diffusion speed of robotisation, flexible manufacturing and finally low unemployment rate (Table 16). But given the systemic characters of national regulation mode, it is far from easy to assess the exact contribution of the management strategy. For example, the US exhibit rather good results for growth and job creation, but seem to be plagued by a kind of fordist nostalgia : poor productivity record and a long lasting external deficit are the costs of such a drawback.

57. A last objection against the generality of new principles has to be addressed at : this management style would be too impressionnistically described and insufficiently theorized [HUIBAN (1991)], and would contain a clear contradiction between the commitment required from the workers and the authority withheld by middle managers and firms holders [LINHART (1990)]. Similarly, the very circumstances in which the new principles emerge might hide its rational and universal content [YAMAMURA, YASUBA (1987)]. Fortunately, some theoreticians such as AOKI (1990) and KOMIYA (1990) have provided micro-models of the behaviour of the Japanese firms, as a prototype of the new management style. First of all, it can be shown that when uncertainty increases, it is rational for the firm to decentralise production management at the shop floor level : workers can best gather and use the relevant information, without waiting for its centralization. But this short run superiority is closely associated to the search for dynamic efficiency. Via job stability for the core workers, a continuous process of learning by doing is taking place and provides productivity and quality improvements, whereas product innovation is enhanced by employment stability [ABEGGLEN, STALK (1985)]. This

1. EVIDENCES ABOUT THE SUPERIORITY OF THE NEW PRINCIPLES

TABLE 9 : MANAGEMENT RESTRUCTURING AT GENERAL MOTOR : SATURN VERSUS NUMMI

	SATURN Fordism pursued by other means	NUMMI Toyotism adapted to the local context
FIRST PRINCIPLE	F1 : *Automation* in order to replace expensive and (sometimes) troublesome workers	P1 : *Reorganize* productive flows and job rules and then automatise
SECOND PRINCIPLE	F2 : Heavy mechanization introduced from above, by engineers relaying on abstract knowledges, not tested at the shopfloor level	P2 : Start from the shopfloor level and rely on workers' commitment and conceive equipment accordingly
FOURTH PRINCIPLE	F4 : Invest massively in new technologies in order to reap *static* economies of scale	P4 : High quality at reasonable cost via training and learning by doing : *dynamic* increasing returns to scale
NINTH PRINCIPLE	F9 : Only modest transformation of job classification	P9 : A complete elimination of previous job classifications and rules
ELEVENTH PRINCIPLE	F11: Continue to rely an hierarchical control	P11:Minimize the hierarchical barriers and enhance workers'skills and motivation

2. TOYOTISM CLEVERLY ADAPTED IS SUPERIOR TO FORDISM

TABLE 10 : NOT BY ROBOTS ALONE

Assembly plant characteristics*	Japanese in Japan	Japanese in America	Americans in America	European producers
Productivity (hours per vehicle)	16.8	21.2	25.1	36.2
Assembly defects per 100 vehicles	60	65	82	97
Repair area (% of assembly space)	4.1	4.9	12.9	14.4
Stocks (days)†	0.2	1.6	2.9	2.0
Work-force in a team (%)	69.3	71.3	17.3	0.6
Number of job classifications	12	9	67	15
Training of new workers (hours)	380	370	46	173
Absenteeism (%)	5.0	4.8	11.7	12.1
Automation (% of process automated)				
Welding	86.2	85.0	76.2	76.6
Painting	54.6	40.7	33.6	38.2
Assembly	1.7	1.1	1.2	3.1

* Averages for plants in each regions, 1989. † For eight sample parts. Sources: M.I.T.; J. D. Power & Associates

Source : THE ECONOMIST (1990), April 14th, p. 63.

second advantage strictly complements the first one : short run flexibility from one product to another allows a better utilization of capital and workers, which in turn promotes higher profit rate and investment on one side [BOYER, CORIAT (1986)], trust and commitment between workers and managers on the other side [AKERLOF (1984)]. Thirdly, long run contracts with the subcontractors induce a down stream diffusion of innovation, quality and productivity, whereas the specific relations between the banks and the manufacturers allows forward looking strategies, rather independant from short run pressures. All these features converge towards a high growth, good quality and innovative firm, which is superior not only during down turns and for stagnating markets, but during booms. Furthermore,the related firm responds more quickly to technical change. A clear and logical explanation is therefore suggested, even if it stillneeds more investigations. Of course, this does not mean that this general model is void of any weakeness or contradiction : management errors are always possible...and a very uncertain international economy can always destabilise the smartest firms. Nevertheless on average, toyotist or volvoist firms fare better than decaying and obsolescent typical fordist firms.

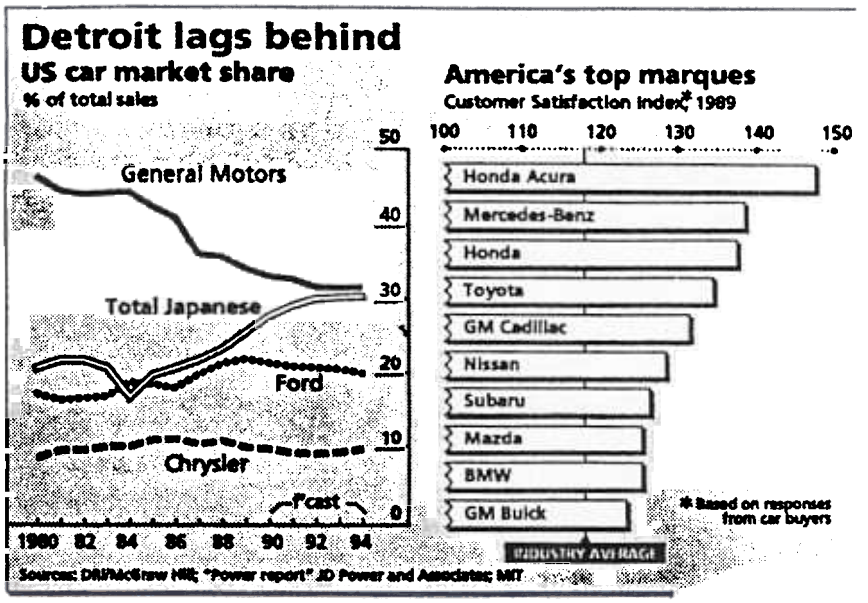
58. A final objection has to be discussed : if this new productive model is so efficient why has not productivity recovered previous trends [BELL (1990), FREEMAN, SOETE (1990)] ? In fact, the absence of any clear superiority does not necessarily derive from the observation of sluggish productivity trends. Some specialists working on economic history [DAVID (1989)] build a parallel between the diffusion of the electrical dynamo at the end of the previous century, and the contemporary problems about information technologies. It took between thirty and fifty years to convert potential reorganization of the factories into effective productivity increases at the aggregate level. The need for an adequate training of engineers and technicians, the slow process of norms emergence, the time nécessary to build the required public infrastructure for private firms to be efficient explain the length of the trial and error period. Therefore, even if the new management model and the information technologies have to drastically change social economic and institutional configuration, it will take time [NELSON (1989)]. OECD countries would therefore be groping out the old fordist system towards the new principles [BOYER, PETIT (1989)]. Consequently, the absence of a strong productivity recovery would derive from the incompleteness of the new technical system, which calls for genuine institutional arrangements [FREEMAN (1989)], not to speak of the adequate economic policies (see V).

§4. WILL THE PRINCIPLES APPLY TO ALL MANUFACTURING INDUSTRIES ?

59. May be the previous analyses have put to much emphasis upon a restricted part of the productive system : the sectors assembling mass produced and consumer goods. Even for these industries, it is not clear that fordism will totally vanish : either an obsolete configuration will transform itself into a more subtle one, more adapted to the context of the Nineties ; or it will be simply exported to less advanced countries (Latin-America, Asia, Eastern Europe). Similarly, some authors challenge the focus upon manufacturing and prefer to investigate the service sectors : they are continuously growing and a priori deserve genuine management tools, with no direct relation with toyotism or volvoism. Let us address to these various objections.

60. It has been convincingly shown that the comparative advantage of the new management model is the strongest for products with many sub-components to be

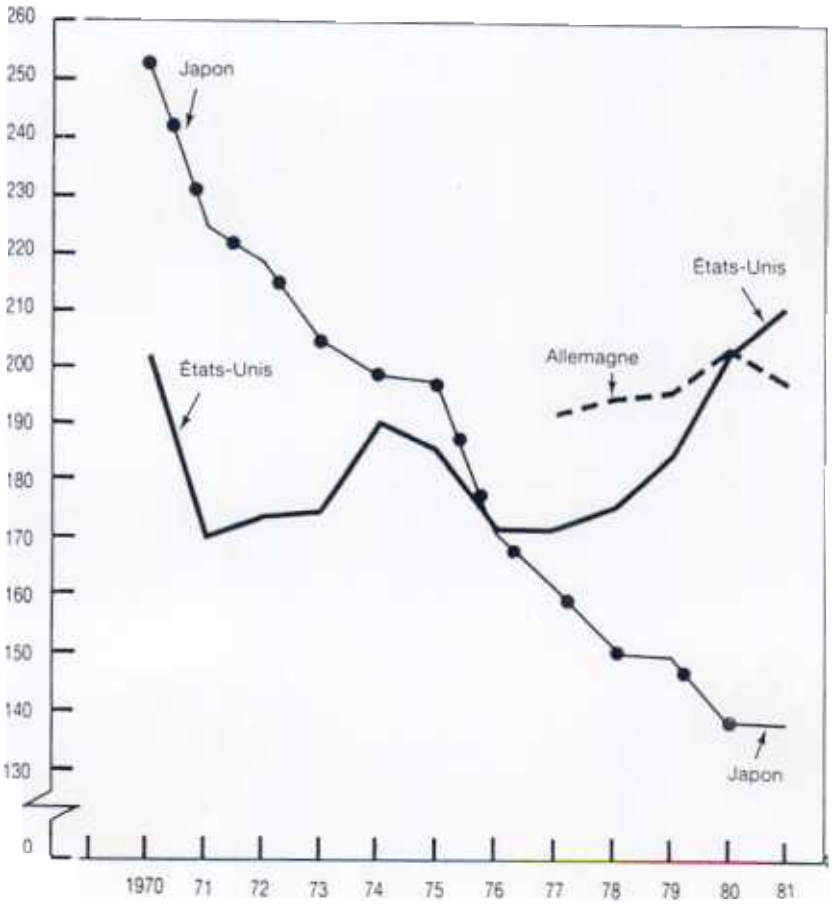
FIGURE 12.A : BETTER QUALITY BRINGS LARGER MARKET SHARES



Source THE ECONOMIST (1990), April 14th, p. 88.

3. DIVERGING TRENDS BETWEEN TOYOTISM AND FORDISM

FIGURE 12.B : CUMULATIVE PRODUCTIVITY INCREASES VERSUS STAGNATION



Source : ALTSHULER (1984), p. 27

assembled [ABEGGLEN, STALK (1985)]. It was invented to respond to the specific problems experienced by the Japanese *car makers* during the Fifties [CUSUMANO (1989)], but it has been applied to many other sectors in the Seventies and Eighties. Therefore, the emerging principles have been implemented in the production of *electronic consumer goods* and have delivered impressive results : very large productivity increases hence a strong decline in relative price, along with an extraordinary diversification of the products. Consequently, this sector experiences the largest increasing returns to scale and scope, as clearly shown by figure 11. Finally, the sector of mechanical and electronized equipment goods, including *robotics*, display most of the relevant features [FANUC (1991)]: global optimisation of the core competence of the firm (P1), building of close and long term ties with users (P3), quick response to changes in the volume and composition of demand (P5), whereas active human resources policies are looking for commitment and competence (P11), via an implicit job tenure (P12).

61. But the new principles are not exclusive and restricted to assembling industries. For example, the *building industry* traditionally used to experience the same challenge about the mix of mass production with rather differentiated products : polyvalent and rather independant workers (P9), genuine wage setting (P12) and the organization of the firm within networks (P6-P7) do anticipate the new principles [CAMPINOS-DUBERNET & Alii (1988)]. Similarly, the more sophisticated assembly-line continue to follow the ideal of totally continuous production flows, as experienced within *process industries* such as petro-chemicals, steel, heavy chemicals [VATIN (1987)]. This global optimization of productive flows (P1) has inspired all the innovators in scientific management from TAYLOR to OHNO, including Henry FORD and his engineers. But in these sectors, most of the knowledge of workers and foremen ends up into sophisticated equipment and software, at odds with the present configuration of toyotism. The *textile and garnment industries* follows a model which is not totally different from the new one : the more successful firms are organizing networks (P7), both between producers (P7) and consumers (P3) and integrate design, production and sales (P2) according to many common features with the new principles (Figure 13).

62. The *sunrise sectors* based upon close relationships between the advances of scientific knowledgesand the design of brand new products do follow most if not all the pattern of the novel model. First it has been stressed that nowadays researchers are organized within networks and therefore follow this core organisational form (P7) [CALLON (1991)]. Second, in high-tech sectors the advances have been so rapid and far reaching that the development of new processes and products generally exceed the core competence and the financial resources of any single, env large company. Therefore, joint ventures are leading in such sectors at the *space industry* [SHACHAR, ZUSCOVITCH (1990)], in *bio-technologies* [HAGEDOORN, SCHAKENRAAD (1990)] and to a lesser extent in the software and hardware components of the *electronic industry*. Of course, the skills of the employees are generally very high, unionization is weak and networks are redesigned according to each specific project [POWELL (1991)]. Therefore the configuration of the industry is not at all the same as that of the TOYOTA MOTOR Company surrounded by a series of quite stable subcontractors (compre Figure 6A with 6B). Nevertheless, the success of any project rely on the same basic principles : use technological advances in order to deliver a new and high quality product, possibly diversified according to the needs of the consumers (P2-P3-P4).

4. A SUPERIOR ORGANIZATION, NOT THE CONSEQUENCE OF WAGE DIFFERENTIALS

TABLE 11 : EARLY EVIDENCES : COMPARATIVE PERFORMANCES OF FORD AND TOYO KOGY (1979)

	FORD	TOYO KOGY	RELATIVE RATIO FORD/KOGY
SIZE			
Total employees hours(millions)	355,75	46,20	7,70
Total production (millions)	3.163	0.983	3,21
GROSS PRODUCTIVITY			
Employees hour per vehicule	112,5	47,0	2,39
Employees cost per vehicule	2.464 $	491 $	5,01
PRODUCTIVITY CORRECTED BY PRODUCT MIX AND LEVEL OF INTEGRATION			
Employees hours per vehicule	87	56	1,55
Employees cost per vehicule	.893 $	589 $	3,21

Source : Extract from ABERNATHY W.J., CLARK K.B., KANTROV M. (1983)

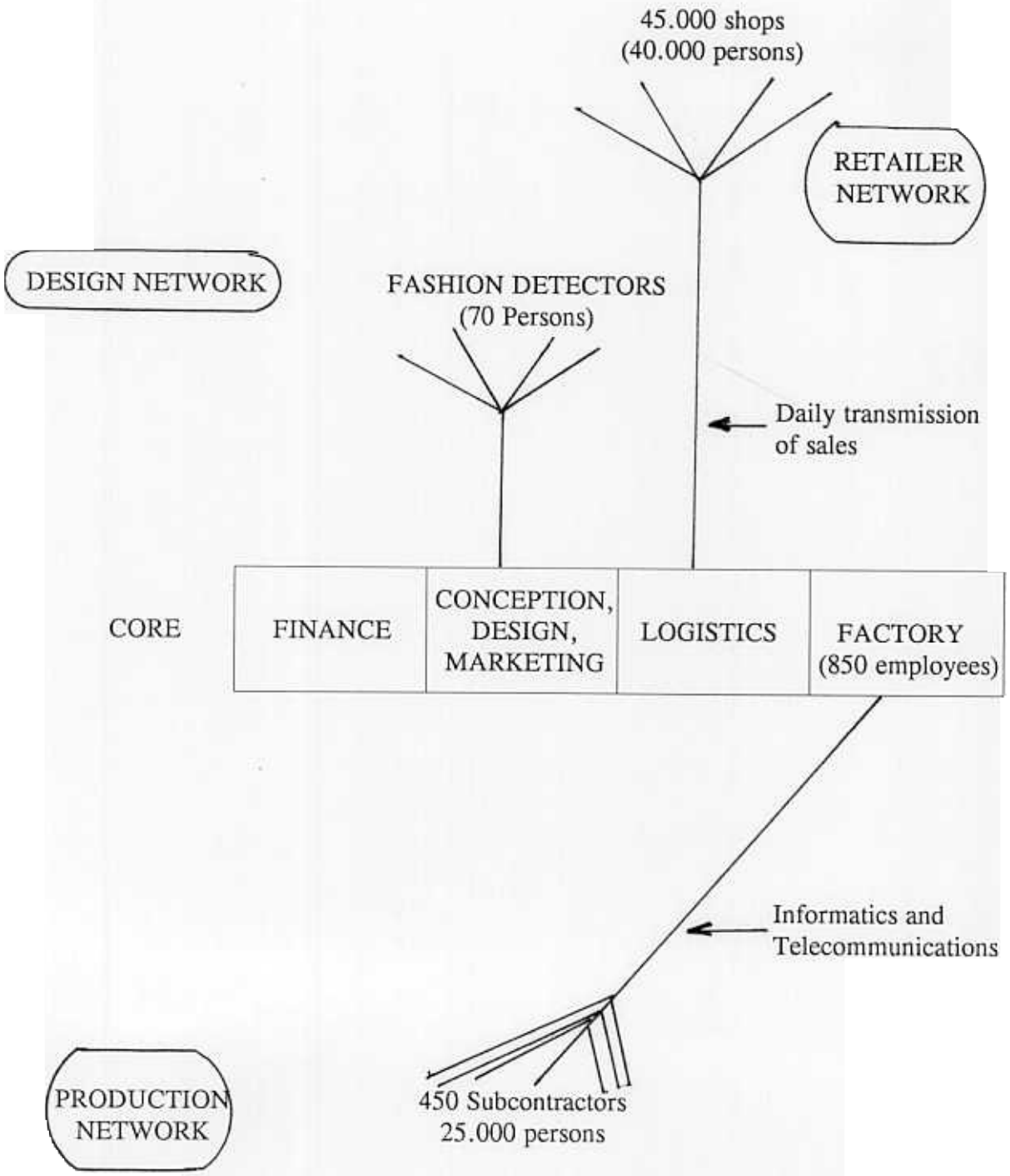
63. Therefore, some *common features* will probably characterise most of manufacturing industries in the present and next decades. Of course, given the context specific to each sector (degree of internationalization, speed of technical change, appropriability of RD, current and future size of the market,...), the twelve principles will be implemented within *different sectoral models*. Systematic statistical analysis suggests the coexistence of different management models, even within the same industry [SALAIS, STORPER (1989)] and of course accross them [SALAIS (1990), BOISARD, LETABLIER (1988)]. One has to remember that the same disparities prevailed within the fordist paradigm, but this paradigm nevertheless used to impose its own rationale, either directly by imitation or indirectly due to the consequences of the "régulation" mode upon sector or firm management [BOYER (1990)]. Consequently, the same pattern might prevail under toyotism : most of the firms will have to change work organization and management style, even if finally their strategies and configurations might be rather contrasted.

§5. WHAT ABOUT SERVICES AND TERTIARIZATION OF CONTEMPORARY ECONOMIES ?

64. Most of the previous analyses refer to manufacturing industries, and seem to neglect the growing importance of employment and production in the service sectors, the share of which is steadily increasing over a century. Therefore, should not any relevant prospective analysis start from the trends in services ? As a first response, it should be noted that manufacturing will likely remain the leader in shaping and orienting technological change, conceiving and diffusing equlpment goods and products which enhance the efficlency of the whole economy [COHEN and ZYSMAN (1988)], and in setting management standards, for labour resources and industrial relations for example. Similarly, even if financial services are now exported, trade in manufacturing will remain a key component in defining national or regional competitiveness [PETIT (1986)]. One can imagine that global growth is still limited by the quality of industrial specialisation, itself linked to the implementation of the new management principles : this old saying about the role of manufacturing as cumulative causation is not totally obsolete [BOYER and PETIT (1989)]. Therefore *manufacturing management style matters*, even in highly tertiary contemporary economies.

65. Conversely, *new services to business* play a growing role in the global competitive process. The quality of the product, its reliability, the density of maintenance facilities, the sophistication of the ties between producers, designers, retailers and consumers might be essential in the new model. Organizing a feedback from the consumer to the plant might provide a larger capacity for quality improvement and product innovation [CHASE, GARVIN (1989)]. In some extreme cases, the quality of the services is the key factor in explaining market share or oligopolistic pricing. Precisely, according to the new principles, the global optimization of design, production and sales call for a shift in the borderline between manufacturing and services [STANKIEWICZ Ed. (1988)] including banks [PETIT, VERNIERES (1989)]. After all, this is not a novelty since the fordist era had experienced the same burgeoning of new business services such as accounting, insurance, marketing, advertisement. Similarly, toyotism as well as volvoism are implying a genuine synergy between the organization of the plant and the numerous services which interact in order to provide market power and shares. Consequently, it would be erroneous to oppose, and not to combine, the dynamics of the manufacturing industries on one side, the innovations in the business services on the other. Largely similar factors are shaping both sectors.

FIGURE 13 : AN EXAMPLE OF A NETWORKING IN THE TEXTILE INDUSTRY : THE BENETTON COMPANY



Source : Translated from O. GELINIER (1990), p. 114-116.

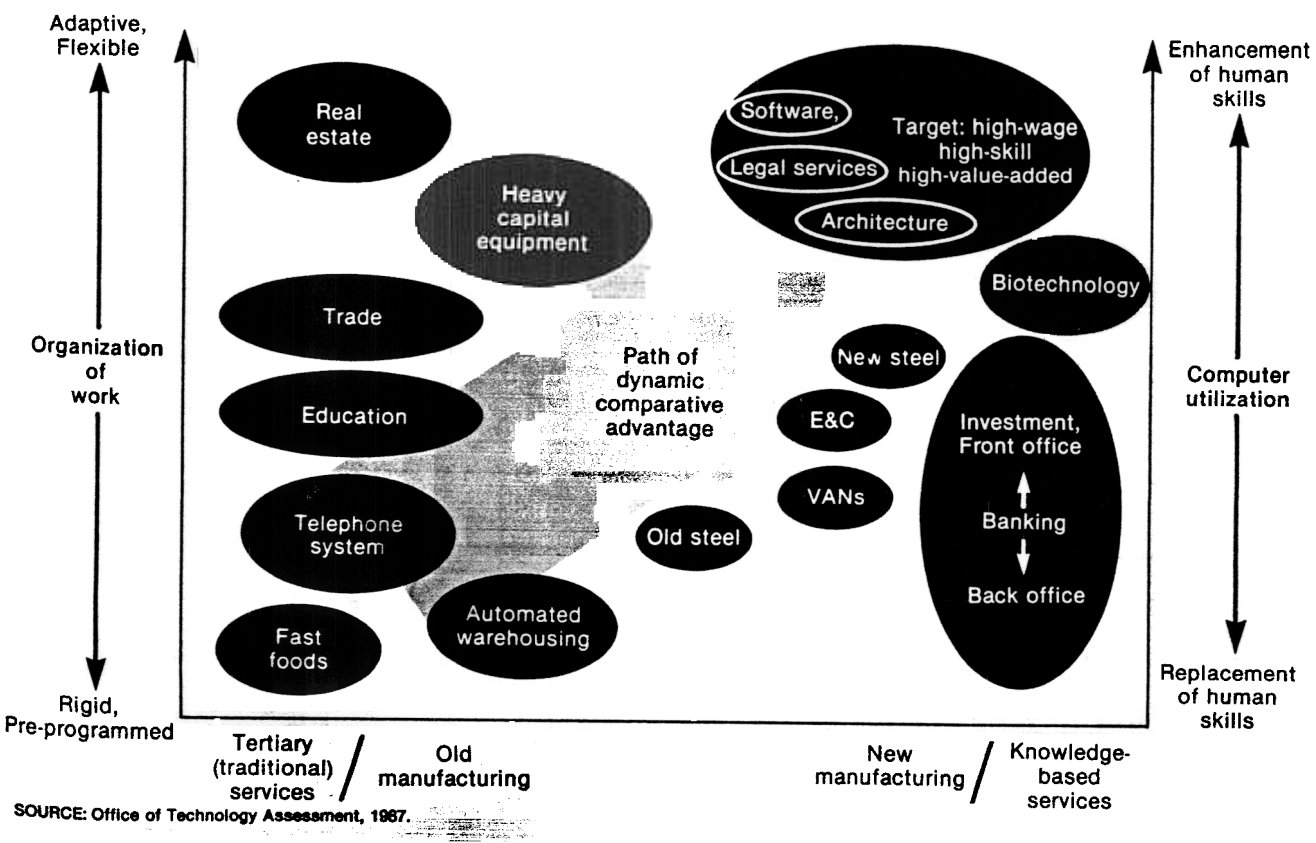
66. In fact, *the search for quality and versatility* permeates into many services, directed towards business but also to households. Carefully observing the behaviour of consumers, establishing long run ties with them, redesigning product and organization in order to reply to their complaints, all these strategies have a profund impact upon quality and therefore competitiveness, both for manufacturers and the service companies [REICHHELD, SASSER (1990)]. Still more, some structural analyses have explicitly drawn a parallel between the manufacturing and services [OTA (1987), ROACH (1989)]. For example, the back office of a bank, used to be the analogous to an assembly-line. More and more it is replaced by the banks'front office, computer aided, i.e. the equivalent of the new manufacturing enterprise. Rigid preprogrammed tasks are replaced by an adaptative and flexible work organization and content, whereas computarization allows an enhancement of human skills, not their replacement in machines as used to prevail within fordism (Figure 14).

67. Thus, many if not all of the new twelve principles will permeate into various the tertiary industries (Table 12). Global optimisation, full integration of product and process innovations, the major concern for quality and servicing, the flexibility in response to new demands (Pl, P2, P4, P5) are main characteristics of the services, especially those directed towards firms. Insurance, banking, financial intermediation, engineering, marketing and editing all manifest clear tendency to implement just in time techniques, high quality at low costs, large versatility with respect to consumers, expectations and needs. Again, the problem is organizational and not purely technical [CAULKIN (1989)]. The current *transformations in banking* are enlightening : a move away from mass production of standardized loans and financial assets is taking place, which challenges the inner organization of the whole banking industry. "Size alone is anyway no guarantee any more of success for a bank (...) no longer like some *financial factory*, mass producing loans and needing to keep production line runing almost at any cost. As with modern industry, tightly costed, high-value-added, tailor-made and *flexible financial manufacturing* is becoming the name of the game, even for those who see themselves has the low cost producers of a given product or service" [The ECONOMIST (1990)].

68. These changes in the product mix of banks, the multiplicity of *financial innovations*, the globalization of market and the deregulation of the Eighties definitely call for genuine human management resources, along principles P9 to P12. Sophisticated financial instruments along with the use by employees of computer networks dealing with precious informations need well trained, commited and polyvalent workers [ANNANDALE-MASSA, BERTRAND (1990)]. Therefore, the educational level required will climb up and will reduce job creation for low skilled workers [BENGTSSON (1989)]. Mutatis mutandis, the banks and probably the insurance companies are facing a challenge similar to the transition from a mass production era to another featuring quality, diversification and continuous innovation. Among the various services, banking, finance and insurance are probably the more likely candidate for an implementation of the new management principles (Table 12).

69. Of course, their relevance will vary a lot according to the specific constraints which each sector is facing. For example, the *distribution sector* might be a good candidate for change : telecommunication and computers provide an ideal tool for optimizing turnover, optimal renewal of orders, on the spot payment via electronic money, as well as a detailed knowledge about consumer tastes. An investigation upon the impact of information

FIGURE 14 : SOME PARALLELS BETWEEN MANUFACTURING AND SERVICES



Source : OTA (1987), p.41

technologies in Europe suggest that the improvement of the financial results of the retailing industry is one of their major outcomes, along with robotization, FMS, CIM for the manufacturing industries [PETIT, TAHAR (1991)]. Finally, the distinction between manufacturing utilities, business services are not so overwhelming that they would imply opposite management styles. For example, the link between employees'commitment and the quality of service is well known and makes it likely that the management strategies will evolve similarly rather than diverge. Even some public or non profit services can implement with success the nw principles [EDQUIST, GLIMELL (1991)].

70. *Information technologies themselves* can help in solving the major problems in both sectors [OTA (1987)]. In the manufacturing industries, they potentially integrate conception and manufacturing (P2), provide an optimization of inventories, capital utilization, intermediate product waste (Pl), allow a productive decentralization (P6) and the constitution of networks (P7), whereas they call for workers'commitment since any malpractice might have disastrous consequences. In the financial system, or administrative work, information technologies contribute to information storage and retriving, its diffusion to a network of users, an integration of the various divisions of the firm, therefore they should provide faster data processing and finally better services. Again the two configurations, however different, belong to the same broad category. For example, the downgrading strategies of white collar work was implied by the fordist principles (F9, F10). In contrast, computerization *allows* the creation of intermediate skills, more in line with commitment and the initiative. The training of workers in most services (business services, health education, banks, insurances, ...) is therefore on top of the agenda (P9, P10, Pll).

§6. THE SMALL FIRMS AND NETWORKS : ANOTHER CONFIGURATION FOR THE NEW PRINCIPLES ?

71. Another objection might emerge from these analyses and prognoses : they would mainly relate to large conglomerate firms and not to the majority of medium or small size firms. Will the new management style, progressively diffuse itself to the majority of the firms or will it organize a dual economic system ? Powerful multinational corporations would reap oligopolistic rents by implementing toyotism, whereas smaller firms would continue to be run according to a more *conventional management style*. The issue is the more relevant, the more impressive seem the performances and the market shares of some very dynamic small or medium size firms. If two centuries of industrialization have drastically reduced the employment share of the smaller firms, the interwar crisis and the Seventies and Eighties have experienced an interruption of their decline, and even a boom of their employment share (Table 13).

72. Academics and experts have expressed *two contrasted scenarii* about these stylized facts. Some have forecast a new industrial divide, i.e. structural change away from mass production, the domination of large conglomerates and the influence of national States. A myriad of innovative, rather equalitarian and flexible small firms would progressively supply highly customized goods, challenging clumsy, slow and more and more inefficient large firms [PIORE, SABEL (1984), HIRST (1989)]. Others conceive the new dynamism of small firms as a way out of fordism, but not necessarily the basic features of the alternative management style and "régulation" mode [BOYER (1988a)]. The interwar great depression would repeat itself : initially large firms in mature industries would bear most

TABLE 12 : WILL THE SERVICES FOLLOW THE NEW PRINCIPLES ?

SECTORS / PRINCIPLES	DISTRIBUTION	TRANSPORTS	COMMU-NICA-TIONS	BANKING AND INSURANCE	SERVICES TO FIRMS	LEISURE	HEALTH	EDUCATION
P1 : Global Optimization	** Traditional information techniques strength	* Present	* Mainly infrastructures	** Enhanced by microelectronics	0	* Present	Present but difficult (HMO)	Institutional limits
P2 : Integrate R&D and production	0 Not the problem	0	* Large inertia due to standards	* Yes via financial innovations	0	0 Search for new concepts	** Very powerful in hospital, new medecines	Not the problem
P3 : Link users and producers	* Part of the job	* Via the price system	* Network effects	** Strong incentive	* Exist for large firm	Present	* Yes for health maintenance organization	** Traditionally close
P4 : High quality at reasonable costs cost	* Present	0 Congestion problems	* Via new standards	* Mainly high speed and flexibility	0	0 No, quality at average or high costs	0 Generally, high quality and high costs	0 No, quality means high costs
P5 : Insert the market into the production process	* Modern (electronics) inventory management	** Electronic reservation	0 Design price system accordingly	* Self banking and telecom.	* high flexibility	0	* Present, via large diversity of diseases	* Emerging, via some reforms
P6 : Decentralize production decisions	** Fulfilled	*	Technically difficult	** Movement away from centralization	** Specialized firms, usually small	*	** Evident for doctors,outside or within hospitals	* Emerging (more decentralized programmes)
P7 : Networking and/ or joint-ventures	** Evident	** By nature	**	**	0	* Present	* In some respects	* Present
P8 : Long run and cooperative subcontracting	* Yes, for example franchise	0	0	0	0	0	No	No
P9 : Lesser division of tasks within production,maintenance,management	* Clear in spite of fordist temptations	0	0	* Yes in the 80's but fordist strategies previously	* Usually some polyvalence	0	* Yes	* Yes
P10: Maximise individual competence	* Not a very frequent strategy	0	0	* Clear in some countries or firms	** Customized service	0	*	* Conventional objective for teachers
P11: Commitment & loyalty more than coercion	* Intended, but not easy to manufacture	0	0	** Conventional policy in order to attract deposits	*	**	* Medical deontology	* Yes
P12: Long run compromise between managers & workers	Not clear	0	0	Present (career)	0	0	0	Via collective agreements (usually strong unions)

in the burden of the adjustment process [SENGENBERGER, LOVEMAN (1987)], but when the new productive paradigm will fit with genuine economic policies and structural reforms, the large firms will take again advantage, by reaping simultaneously economies of scale and of scope [CHANDLER (1990)].

73. A cursory analysis of the *Italian districts* might be useful in order to discriminate between the two hypotheses. Experts now agree [MARUANI, REYNAUD, ROMANI (1989)] that the surge of small or medium size firms in Italy might be related to the specificity and the gravity of the crisis of fordist principles and management in large firms such that FIAT. The rejection by blue collar workers of the fordist division of labour and hierarchy had led to intense struggles between labour and capital, in such a manner that cutting down job in large plants and developing outsourcing have been the leading strategies, for example in the car industry [BAGNASCO (1989)]. Simultaneously, the growth of demand for diversified consumption goods call for a complete internal reorganization of the large firms, whereas microelectronics and robotization provide larger flexibility to adjust to model changes, without impairing production costs. According to a strict parallel with the transformation occuring in large firms, old or more recent industrial districts have shown an impressive capacity to adapt to fast demand shifts, in volume and composition, given the very uncertain macroeconomic context of the Seventies and the Eighties [BECCATINI (1989)]. One precisely recognizes the very factors triggering the breaking-down of the fordist paradigm (C3-C4-C5-C9-C11) : the renewed dynamism of Italian industrial districts during the Eighties is closely related to the theme of this paper, and not a counter example to the broad vision it provides.

74. But of course, this original networking of small firms pooling their technical competences, knowledges about markets and financial resources exhibits *an original configuration for the twelve principles*. Looking at the organizational configuration of the BENETTON enterprise, it is clear that a small number of core employees are coordinating a complete nexus of subcontractors, market analysts and retailers (Figure 13). This is an impressive implementation of the principles P1 and P2, and possibly P3, whereas the objective of inserting demand within the production process is the very role of BENETTON's managers. Of course, the capital labour compromise does not look like to those of TOYOTA and SONY, but the Italian familial enterprise finally fulfill very similar objectives : minimizing hierarchical control and preventing adversarial behaviours between capital and labour(i.e. principles P11 and P12). The economic performances of industrial districts in terms of export, employment and growth have been rather or quite good all over the Seventies, which implies a significant efficiency of this organizational form.

75. Thus this *genuine and horizontal networking* might provide economies of scope and variety, as well as economies of scale. Under fordism, vertical integration and subcontracting by the large firm was the dominant way for organizing mass production and delivering productivity increases. Under the new principles, the benefit from mass consumption can be obtained by numerous small firms, belonging to the same territory, complementarily specialized and drawing on the same human resources and labour market [STORPER, SCOTT (1988), BECATTINI (1989)]. Consequently, Italian industrial districts are probably *an alternative form to toyotism or sonyism*, but incorporating quite similar mechanisms concerning division of labour and fast reactions to market changes. Paradoxically enough, this model goes back to earlier stages of industrialization and recalls many insights put forward by Adam SMITH and Alfred MARSHALL, who devoted a

TABLE 13 : EMPLOYMENT SHARES IN SMALL AND MEDIUM SIZE FIRMS

A. RECENT EVOLUTION : AN INCREASING SHARE

JAPAN	1969	1972	1975	1978	1981
Small	70.1	71.5	73.8	76.1	77.1
Small and med	83.1	84.2	85.6	87.5	88.3

UNITED STATES	1962	1965	1970	1975	1978	1979	1980	1981	1982	1983
Small	51.3	51.5	49.5	54.0	54.4	54.1	54.3	54.5	55.1	56.1
Small and med				76.9	77.7	77.6	78.1	78.5	78.6	79.2

FRG[2]	1977	1978	1979	1980	1981	1982	1983	1984	1985
Small	47.0	47.4	47.9	47.7	48.3	49.0	49.7	50.2	49.6
Small and med	70.4	70.7	71.1	70.9	71.4	71.9	72.3	73.0	72.3

[1] 1-300 employees
[2] Data from Employment Statistic; see: Cramer, 1987

B. LONG RUN TRENDS : A PARALLEL WITH THE INTERWAR PERIOD.

FRG[1]	1882[6]	1895[6]	1907	1925	1933	1950	1970
Small[2,4]	78.0	70.4	62.9	53.3	62.0	56.8	43.6
Smal and med[2,5]	88.1	84.4	79.7	69.9	76.4	73.0	63.2
Smal[3,4]			57.6	49.3	56.6	53.9	42.1
Smal. and med[3,5]			76.8	67.4	73.0	71.2	62.2

UNITED STATES[7]	1909	1919	1929	1933	1939	1947	1967	1977
Verv small[8]	14.4	10.3	9.8	10.0	9.5	7.2	5.6	6.5
Smal[9]	37.8	29.2	29.1	30.8	30.0	25.0	23.2	25.3

[1] For total economv, census data
[2] Includes the self-emploved in the small cate
[3] Excluues the self-emploved altogether
[4] up to 50 emplovees
[5] up to 200 emplovees
[6] No self-emploved data for these vears.
[7] Manufacturing sector; Census of Manufacturers
[8] Less than 20 emplovees
[9] Less than 100 emplovees

Source : SENGENBERGER W., LOVEMAN G. (1987), p. 116-117

special chapter of his economics principles about industrial districts [GAFFARD, ROMANI (1990)]. The breaking down of the golden age of high and stable growth would give a new relevance to this neglected productive organization.

76. In fact, a network of small and interdependant firms can satisfy to most of the new principles (Table 14). First of all, they provide a global optimization of competences, production capacities, finance and marketing abilities (P1), at odds with the large bureaucratic division of tasks which used to rule the large conglomerate firms. Secondly, delivering good quality and shifting easily from one product to another are two major features of the industrial districts (P4 and P5). Thirdly, manufacturing workers'commitment (P11) and transmiting technical skills and knowhow (P10) are easy given *the social, political and cultural context* in which most of these regions operate in central Italy. In fact, the capital labour compromise is mainly implicit, since unions are usually weak and a familial or paternalistic vision of the firm prevails [BRUSCO (1990)]. This is a similarity with respect to toyotism but this exhibits a strong difference with respect to the Scandinavian implementation of the new principles.

77. Nevertheless, this industrial model has some weakenesses, which have been stressed upon by Italian scholars [BIANCHI (1985), BELLINI (1987)]. Firstly, it seems to be more efficient in stagnating and low or medium tech sectors such as the textile, the garnment and footwear [PORTER (1990)] or conventional mechanics than in rapidly growing high-tech markets. In other words, *static efficiency* is privileged with respect to the dynamic efficiency provided by the integration of RD, production and marketing (P2). Secondly, when innovations derive from intensive research and development expenditures or when a rapid technical change makes obsolete most of previous competences, a large amount of investment is required, which is generally out of scope of the limited financial resources of most industrial districts. Thus, the RD associated with a new generation of electronic chips supposes billions dollars of investment [COHEN, ZYSMAN (1987)], which prevent any network of medium size firms to get into such an industry.

78. Thus, it is not surprising that during recent years, a significant concentration has taken place within Italian districts, precisely in order to provide finance, external know-how and permanent sales networks. Therefore, the typically horizontal networks would ultimately lead to some degree of hierarchy as regards finance and RD [HARRISON (1989)]. Symmetrically, the large Italian firms such as FIAT and OLIVETTI have significantly developed their sub-contracting and reduced the relative size of their core divisions and headquarters. Thus the internal organization of the northern and central Italy firms seem to have converged towards a common model, in which vertical integration of finance and research goes along with a significant decentralization of productive plants [REGINI, SABEL (1989)]. In a sense, the Italian model and this example of quasi-vertical integration reminds us that contrary to a widely diffused belief, there might exist a multiplicity of managerial systems, which could cope with the post fordist requirements. This very important hint deserves closer investigation.

§7. A TYPICALLY JAPANESE OR A WORLD WIDE MODEL ?

79. Are not the features describing the new model (Table 3) too closely related to Japan alone ? Indeed, Japanese manufacturing is precisely the better example of the implementation of the twelve principles. Starting from the typical fordist model after

TABLE 14 : CAN SMALL FIRMS IMPLEMENT THE NEW PRINCIPLES ?

A LOOK AT THE ITALIAN INDUSTRIAL DISTRICT

IMPLEMENTATION PRINCIPLES	LOGICAL POSSIBILITY FOR SMALL FIRMS	ACTUAL PLACE IN INDUSTRIAL DISTRICT
P1 : Global optimization	Yes, not any inertia with fordist principles	Pooling and optimization of knowledge, production capacities and sales network
P2 : Integrate R&D and production	Yes, for example machine tool industry	Yes, for mechanical innovation but not for high-tech
P3 : Link users and producers	Yes, rather or quite present	Indirect via the network of retailers
P4 : High quality at reasonable cost	Not evident but contemplated by PIORE and SABEL	Importance of quality and versatility more than cost
P5 : Demand within the production process	A traditional feature, typical of small firms	High response to market changes in volume and composition
P6 : Decentralize and reduce hierarchy	Prominent feature	Very important for Italian districts
P7 : Networking & joint ventures	Distinguish between horizontal and vertical networks	A basic example of this principle
P8 : Long run cooperative subcontracting	Possible with some difficulties	Local stable rules, but high productive versatility
P9 : Larger polyvalence	A typical feature	Specialization and complementarity of firms
P10: Maximize competence	Possible in many sectors based on knowledge and know-how	Significant feature of existing industrial district
P11: Commitment and loyalty	Yes, due to the absence of numerous authority levels	Via political institutional compromise at the local level
P12: Job tenure or good wages	Only implicit for job tenure, but lower wage than in large firms	Might exist but generally implicit

World War two, the Japanese managers have taken into account the specificity of their economy, in terms of capital labour relations, family values, links between finance, industry and politics [OHNO (1978), SHINGO (1983)]. Three or four decades later, many comparative studies suggest that this has led to *an original model* [CORIAT (1991), JACOT Ed. (1990)]. Workers are more polyvalent (P9), production decisions are much more decentralized (P6), subcontractors are incorporated into the medium term strategies of modernization (P8), people conceiving new products and processes are closely linked to production, and production is interacting with a detailed knowledge of consumers'needs and expectations (P2). Furthermore, the more skilled the workers, the larger the opportunities open to managers in coping with uncertainty, technical change, and oligopolistic rent seeking and sharing (P11). But this supposes an efficient education and a permanent process of learning by doing within the firms (P10). But such a commitment could not be maintained in the long run if wage-earners did not get a significant reward (P12). Implicit job tenure good wages and the equivalent of a profit sharing are the main benefits for workers.

80. Nevertheless, this same evidence can be interpreted according to two contrasted views. For some authors, this model has been reached due to *national specificities* about religion, previous social relations going back in Japanese history [DORE (1986), (1987), MORISHIMA (1982)]. The imbeddeness of economic activity within *conventional attitudes and cultural conceptions* would explain the Japanese achievements. Therefore, the model would be difficult to export.If true, the twelve principles would not be that general, since they could not be easily implemented in other OECD countries, with more individualistic values. Or if some devices such as Just in Time (JIT) or Quality Control Circles (QCC) are implemented within overwise unchanged business organizations, they do not provide the expected results, which turn out to be quite inferior to that obtained in Japanese firms. These failures may suggest that some major ingredients, for example cultural values, are missing and therefore are blocking the implementation of the new model.

81. For other scholars, beneath the clear cultural and historical specificities of Japan, one could find a *coherent, rational and therefore general model*, which under the environment of the Eithies and Nineties *is* superior to the A or H model (see § 3). The very specific genesis of the J Firm might not hide the coherence and functionality of the resulting organizational structures, given the context of the Eighties and the Nineties. AOKI (1988) argues that the choice between vertical integration or networking depends upon the type of uncertainty (local or global), the importance of learning effects and the incentives provided by the existing compromise between employees and managers. If each market and productive activity becomes more uncertain (but not too much) and if training investment are mainly specific, then the J Model gives better results than the A Model. In our taxonomy, toyotism is superior to fordism.

82. The role and logic of greater *job security* in Japan has led to the same duality between its historical roots and its contemporary role. There is no doubt that large firms have been using in a new context conventional values deriving from a feudalistic or paternalistic pattern, according to an old Japanese legacy. But simultaneously, its persistence over several decades cannot be a mere chance : in this system, large firms have been able to cope with uncertainty, without adjusting tenured job, but varying new entries, subcontracting and wage bonuses. Modern economic theory suggests that this is a rational

TABLE 15 : FIVE OECD COUNTRIES FACING THE CHALLENGE OF THE NEW MANAGEMENT PRINCIPLES

A VERY PROVISIONAL AND TENTATIVE SYNTHESIS.

COUNTRIES / PRINCIPLES	FRANCE	JAPAN	SWEDEN	UNITED STATES	WEST GERMANY
P1 : Global optimisation	- Recognized, but difficulties in implementing it	+ + STRONG Example : capital and inventories/ output ratio decline	+ Present Example : Uddevalla low break even point	- Hindeed by fordist inertia, succeeded by Japanese firms	+ Existing but some conservatism
P2 : RD and production integration	- Efforts but lagging organization	+ + LEADER ROLE Example : shorter design times	+ + Very dynamic product and process RD	o Difficult in spite of success full examples	o Follows the old model with minor exceptions
P3 : Users-producers interaction and diversification	- Fairly low Example : failure of the equipment goods industry	+ IMPORTANT for equipment goods	+ Limited due to the role of external markets and the size of the economique	- Fairly low. Example: quasi none for equipment goods	+ Significant via servicing of equipment goods
P4 : High quality at low cost	- Recent efforts, but still quality problems	+ + A KEY FEATURE of Japanese style	o Quality of servicing but extra cost of customized goods	- - For quality and relative high costs	o High quality but not clear cost advantage
P5 : Productive versality to demand	- Traditionally low	+ + IMPORTANT Example : short lag in the car industry	+ Existing, even if not very fast	- Sluggish in mature industries, present in high-tech industries	+ Average, along the previous model
P6 : Production decentralization	- Typical centralisation in large firms	+ SIGNIFICANT, if not general Example : impact of microelectromics (ME)	+ Well-known experiments (from Kalmar to Uddevala) but taylorism still exists	- High centralisation in spite of Japanese success full experiments	+ Significant responsability for skilled workers, but rather centralized management
P7 : Horizontal coordination and net working	- Emerging, but not very strong	+ + LARGE Example : Kanban and now ME	+ Existing at the plant level	- Used to be forbidden by anti-trust laws, now reversed	+ Yes at the regional level
P8 : Long-run, cooperative subcontracting	- Emerging, for example in the car industry	+ APPLIED to fist tier subcontractors	o Not clear	- Idem	+ Role of professional mobility
P9 : Recomposition of production-maintenance-programming	- Not very easy due to hierarchical barriers	+ + VERY SIGNIFICANT	+ Active field in some key experiment	- Rather difficult	+ Exists, but not very strong
P10: General ecudation and on job training	o Averagge performance of both general education and training	+ VERY SIGNIFICANT in large firms, LOWER in other firms	+ + Active role of public authorities in retraining and upgrading skills	- - One of the poorest performances for OECD countries	+ + Excellent system combining general education and practical learning
P11: Workers'competence and commitment	o Implicit ; now major concern, but practice one lagging	+ + USUALLY STRONG Example : Support to the "firm culture"	+ In order to fight against turnover and absenteism	- A tradition of adversarial relations, control and financial incentive	+ Clear for high and medium skilled workers
P12: Long term compromise over job tenure and/or good, wage	o Only marginally present in some firms ; no more existing at the national level	+ IMPLICIT, covers only large firms employees	+ + At the national level: compromise over a maintained quasi-full employment	o Marginally existing short run sighted capital-labour relations	+ + Active negociations about new technologies, wages, work duration
GENERAL SUPPORT AND CLOSENESS TO THE NEW MODEL	FORDIST AND CULTURAL INERTIA	JAPAN INVENTED IT (TOYOTISM , SONYISM) "Diversified quality mass-production"	AN ORIGINAL VARIANT (VOLVOISM) "Customized quality competitive medium sized production"	FORDISM NOSTALGIA "The inconvenient of having been too successful:a very difficult transition to a new regime"	AN ORIGINAL VARIANT "Quality competitive medium or mass-production"
SYNTHETIC INDEX (*)	- 0,375	0,80	0,54	- 0,50	0,50

*) Obtained by algebraically summing up all the "plus" + and "minus" - and dividing with the maximum score (12 x 2) in order to get an index, between 1 (complete support) and - 1 (at the opposite of the new model).

Source : An impressionnic use of the five national reports and most of the references quoted by the text.

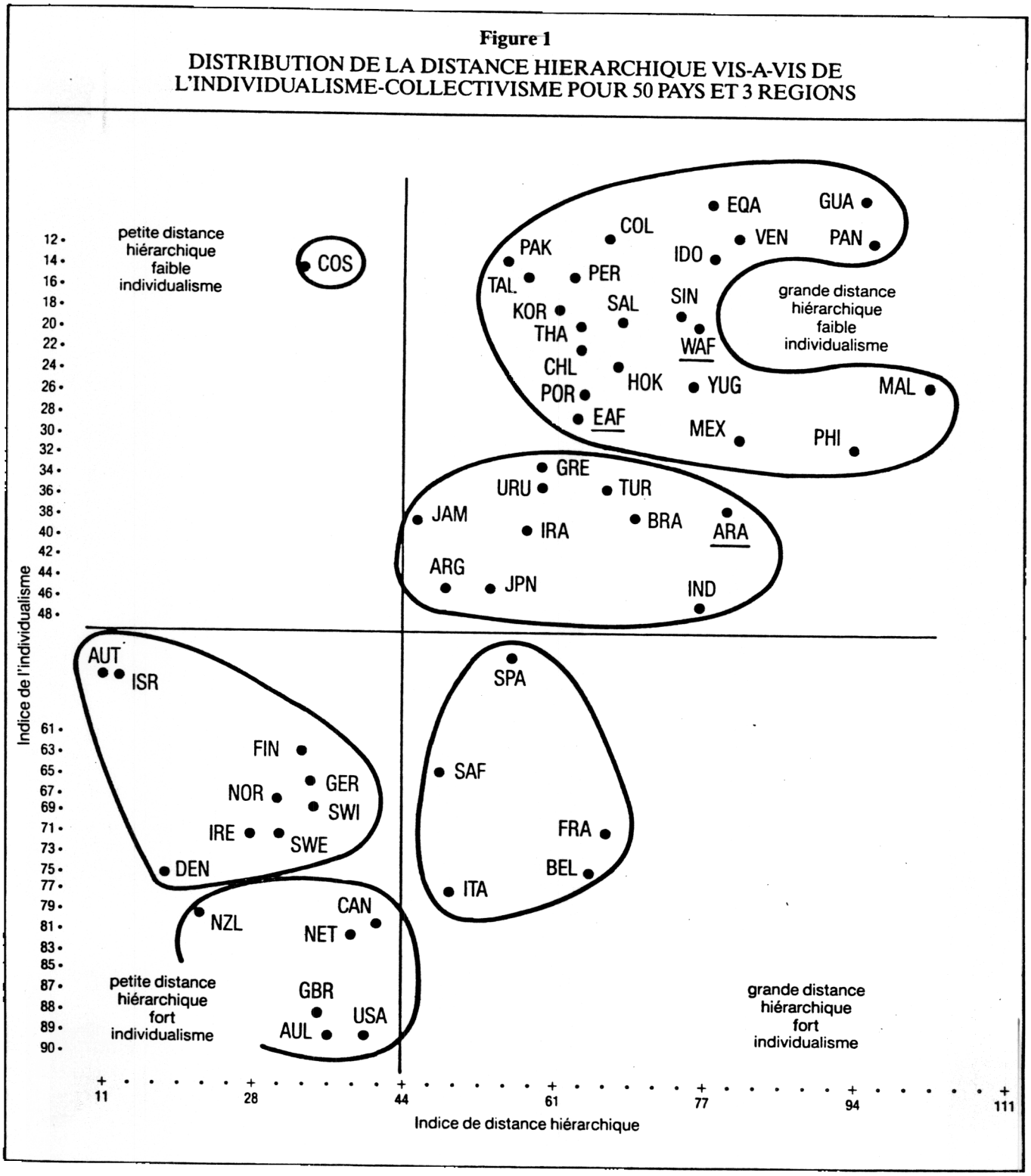
behaviour, if the global efficiency of the firm is mainly related to the stability of firms specific investment for the blue collar workers and the managers as well. *An optimal allocation of skills* is one of the consequences of this model [KOIKE (1987)]. In another institutional context, the German vocational system is another method for managing the collective good element inherent to any individual training decision and policy [STREECK and SORGE (1988), STREECK (1989a)]. Again a national legacy strongly interacts with the contemporary functionalism of the related institutional framework.

83. The purely cultural view cannot explain the apparent successes of some *Japanese subsidaries* in UK [CAWSON (1989)] and in US [ADLER (1989), THE ECONOMIST (1991)]. If the national ways for organizing hierarchy and the opposition between holistic and individualistic societies was so absolute (Figure 15), the reorganization of national factories by Japanese managers would have been a failure. Quite on the contrary, a selective hiring, a fair treatment of workers, the removing of hierarchical barriers, the negociation of a compromise with a unique union, do appeal to initiatives and have an effective impact upon productive organization. Associated to a large investment in training and reskilling, these strategies seem to have overcome most of the previous stalemate. May be ironically, the managers themselves are probably culturally determined by their own home country [HINDLE (1989), MOSS KANTER (1991)]. For example the American concern for short run financial results, the poor ranking of production and engineering in managerial values, a climate of distrust with respect to blue collar workers probably explain the large hysteresis of fordist principles in this country (Table 15).

84. *The comparison of Japan with Sweeden* is enlightening in this respect. It might seem a priori surprising to note similarities between sonyism and volvoism, i.e. Japan and Scandinavian countries, or may be social market economy such as former West Germany. But if one looks carefully to the twelve principles, most of them are fulfilled by these countries [BURTON (1989)]. Of course, some other features distinguish the J model from the V model [AUER, RIEGLER (1990)]. Firstly, unions are quite strong and negotiate at the national, sectoral or regional level, at odds with the very decentralized Japanese system. Secondly and consequently, the solidaristic Swedish wage policy implements very reduced wage differentials, whereas income disparities are far larger in Japan [FLANAGAN (1987)]. Third, the management of declining sectors is very different indeed : on one side, regional or national authorities are organizing the retraining and subsidising job creations ; on the other side, large corporations tried to internalize training and mobility, whereas the secondary sectors and part time or transitory jobs bring some purely quantitative flexibility. While this view has been challenged by EDQUIST and GLIMELL (1991), BURTON (1989) and AOKI (1988) have found striking similarities between *shop floor management* in these two countries.

85. If the diagnosis is correct, the consequences are far reaching : the new model would a priori be quite general, able to be implemented *in different modern societies*. Therefore, this vould be another evidence about the inadequacy of the purely cultural explanations, as pointed out by DERTOUZOS, LESTER and SOLOW (1989). The possibility of such a social democratic variant for the new management principles has indeed important implications for economic policy : toyotism, sonyism or volvoism could be exported, once translated and adpated to various national cultural values and economic objectives. Of course this does not mean that the Swedish model has not recently experienced severe problems in maintaining the industrial relations inherited from the Thirties : but the

FIGURE 15 : ARE MORE HOLISTIC ATTITUDES PROMOTING THE IMPLEMENTATION AND VIABILITY TO THE NEW MANAGEMENT MODEL ?



Source : HOFSTEDE (1987), p. 13.

conflict over solidaristic wage policies takes place at a quasi-full employment and has not prevented, quite on the contrary, a rapid modernization of the Swedish industrial firms. In any case, the major problem facing managers, unions and governements is not an easy one: how to proceed in order to mix the existing national values and institutions in order to get *a functional equivalent* of the new emerging principles ?

IV - COMMON PRINCIPLES BUT CONTRASTED NATIONAL STYLES.

86. Even if these *principles* are now largely recognized within OECD economies, their *implementation* is quite unequal given the different characteristics of the institutional and socio-political setting specific to each country [ANDERSEN (1990), BERTRAND (1989)]. In the light of economic history, this is not so surprising, since the same variety was prevailing during the previous fordist model : the American, the British, the German, the Swedish and the Japanese cases (Table 1) exhibited major differences in their institutional settings and macroeconomic achievements [BOYER (1989a), (1989b), SCHOR (1990)]. Contemporary research [LIPIETZ (1988)] about the ongoing transformations away from fordism allow the same broad hypothesis. In a sense this is closely related of idea about national trajectories for technical systems [DOSI (1982)]which is here extended to management style. The typology proposed depends upon a personal and probably impressionistic reading of the five national studies and other comparative researches cited in the reference list (Table 15).

87. The table provides a very tentative composite index of *the degree of implementation of the new managerial principles*. It has also been compared with various macroeconomic indexes concerning productivity growth, external trade and unemployment. Simultaneously, various statistical data are provided which try to capture the speed of diffusion of new electronic equipment goods, as well as the intensity of innovations, measured by R & D expenditures (Table 16). A quick survey suggests that across countries, closeness to the new model and the diffusion of flexible technologies seem correlated, especially as shown by Japan, Sweden on one side, and US on the other. Nevertheless, given the few number of observations available, drawing any firm conclusion would be unacceptable. Similarly, the relation with macroeconomic performance is not totally evident, with the exception may be of the two extremes : Japan with the more rapid growth and productivity increases and a large trade surplus, whereas an equivalent growth is obtained in US via a trade deficit and a sluggish productivity. Basically, unemployment performance is the consequence of the whole set of economic social and technological mechanisms, and cannot be attributed in isolation to the management style. In fact their relationships are *systemic* by nature, thus not early investigated by conventional analytical tools.

88. The same uncertainty prevails concerning the possible links between cultural values and social organization on one side, the readiness to adopt and implement the new principles on the other side. It has for example been argued that management style had subtle relation with two broad societal variables : the degree of individualism and on the contrary the domination of holistic principles ; the importance and width of hierarchical barriers [HOFSTEDE (1987), D'IRIBARNE (1989a), (1989b), AUBERT (1989), DERTOUZOS, LESTER, SOLOW (1989)]. A priori, the propensity to adopt the emerging models would be positively correlated with the degree of holistic behaviour (inducing team work, information sharing, cooperative strategies) and negatively with the

TABLE 16 : IS THERE RELATION BETWEEN THE PROXIMITY TO THE NEW MANAGEMENT MODEL AND MACROECONOMIC PERFORMANCE ?

CONTRIES / INDEXES	FRANCE	JAPAN	SWEDEN	UNITED STATES	WEST GER-MANY
CLOSENESS TO THE NEW MODEL	- 0,37	0,80	0,54	- 0,50	0,50
MACROECONOMIC INDEXES					
1. Trade surpluss/GNP (average 1983-1990)	- 0,3	2,7	- 1,0	- 2,5	3,2
2. Standardized Unemployment rates (1990)	9,0	2,1	1,5	5,4	5,1
3. Employment variations (average 1983-1990)	0,3	1,3	0,8	2,1	0,7
4. Growth (average 1983-1990)	2,3	4,6	2,1	3,4	3,1
5. Productivity growth (average 1983-1990)	2,0	3,3	1,3	1,3	2,5
TECHNOLOGICAL INDEXES					
1. Share of manufacturing exports with high R&D					
. 1986	18,9	33,4	16,6	37,3	18,8
. 1971	13,7	19,2	12,8	27,6	15,2
2. Density of industrial robots					
. 1987	3,4	28,3	6,8	3,4	4,2
. 1984	1,4	13,3	4,3	1,5	1,9
3. Density of flexible techno-logies in 1984					
CNC machine tools		22,4	22,2	11,7	11,3
CAD		1,4	7,0	6,7	2,7
FMS (per millions)		19,0	55,0	7,0	6,0
4. Share of RD in value added					
. 1985		5,6	7,6	7,6	5,2

Sources : First line : see Table 15, last line ; Macroeconomic indexes : computed from OECD (1991), Statistical Appendix ; Technological indexes : from C. EDQUIST, H. GLIMELL (1991), Table 1,5,7,8, themselves derived from OECD/STIID Data Bases and various sources.

hierarchical distances and their perception within society (Figure 15). Of course, no clear conclusion comes out for the five countries : France, Japan, Sweden, United States and former West Germany, the only cases for which an index of modernization has been built. This is probably a topic which needs further investigations, as suggested by AUBERT (1989).

§1. AN EXAMPLARY MODEL OF DIFFERENTIATED MASS PRODUCTION : THE JAPANESE TRAJECTORY.

89. Not at all surprisingly, the Japanese firms score quite well concerning *the strategic vision* about the new models (principles P1, P4, P5), where the recomposition of manufacturing tasks and workers'commitment is usually seen as important (P9, P11). The only relative weaknesses seem to be related to the limited extension of the long term compromise over job tenure, as well as the relative elitism of the Japanese educational systems and the unequal distribution of competences between large and smaller firms (Table 15).

90. Nevertheless, within this general conception of management (it should be remembered that management is not taught as such in Japan) various firms operating within the same industries, and with similar links with the financial systems, seem to have developed rather different models. As an example, detailled investigations of the car industry [ALTSHULER (1984), CUSUMANO (1985), JONES (1988), CLARK,TAKAHIRO (1989), BRIE (1987)] exhibit *alternative sub models*. Some firms focus upon innovative design and its integration with flexible manufacturing, others focus on perfecting the continuity of the assembly line, still others rely upon basic innovations in high-tech as the core of their competitive edge. For example Toyotism, Hondaism, or Sonyism define a series of alternative management styles which rank from clever fordism to much more innovative conceptions of work organization.

91. Combined with the other features of the Japanese economy [HOLLINGWORTH, SCHMITTER and STREECK (1989), BOYER (1989b)], the new management style has led to the best results among OECD countries. First, productivity increases and growth, as well as trade surplus are the higher out of the five OECD countries. Unemployment has returned to fairly low levels. In technological matters, Japan manufacturing industries have engineered a big push in high RD export (Table 16). On average Japanese firms are at the forefront of the diffusion of robots and flexible technologies. One notes a symbiotic stimulus back and forth from the management style to innovation and productive modernization. If previous historical examples were to be extrapolated, one could imagine that the J Firm has probably replaced the A firm as an ideal for businessmen all around the world. At a more macroeconomic level, the previous mass production of standardized goods has given birth to a new configuration : that of *differentiated mass production*. The ability of this model to cope with the rising exchange rate of the yen with respect to the dollar after 1985, the fast transformations which have been taking place since the first oil shock its continuous improvement via new technologies, and the applicability and translation of this model to foreign cultures clearly show the potential superiority of this model. But it is far from unique.

LEARNING EFFECTS ARE PERVASIVE...

TABLE 17 : FROM THE WORKERS TO THE MANAGERS

SHORT RUN ECONOMIES OF SCALE	– given capacity – 100% utilization rate
LONG RUN ECONOMIES OF SCALE	
STATIC	Idem + – effect of capacity on efficiency
DYNAMIC	

a) « *Simple* »: *Learning curve only*

b) « *Full* »: *Experience curve*

Source : R. BOYER, B. CORIAT (1986) "Technical Flexibility and macro stabilisation", p. 802.

I - WEST GERMANY : No effect

. Whole economy

TFP = 0.07 q + 2.45 R^2 = 0.04 DW = 2.42
(0.3) (2.3)

Manufacturing

TFP = 0.38 q + 1.61 R^2 = 0.16 DW = 2.31
(1.5) (1.7)

II - UNITED KINGDOM : Some impact

. Whole economy

TFP = 0.31 q + 1.29 R^2 = 0.30 DW = 2.24
(1.2) (2.0)

Manufacturing

TFP = 0.69 q + 2.10 R^2 = 0.82 DW = 1.89
(4.3) (1.7)

III - FRANCE : Significant impact

. Whole economy

TFP = 0.58 q + 0.94 R^2 = 0.73 DW = 2.17
(4.4) (1.6)

Manufacturing

TFP = 0.46 q + 1.89 R^2 = 0.83 DW = 2.16
(9.5) (7.4)

PERIOD : 1960-1986.
NOTATIONS : TFP : Total Factor Productivity Rate - q : Growth rate

Source : B. AMABLE (1989).

§2. DIVERSIFIED QUALITY PRODUCTION IN SOCIAL-DEMOCRATIC CONTEXT : THE SWEDISH AND GERMAN TRAJECTORY.

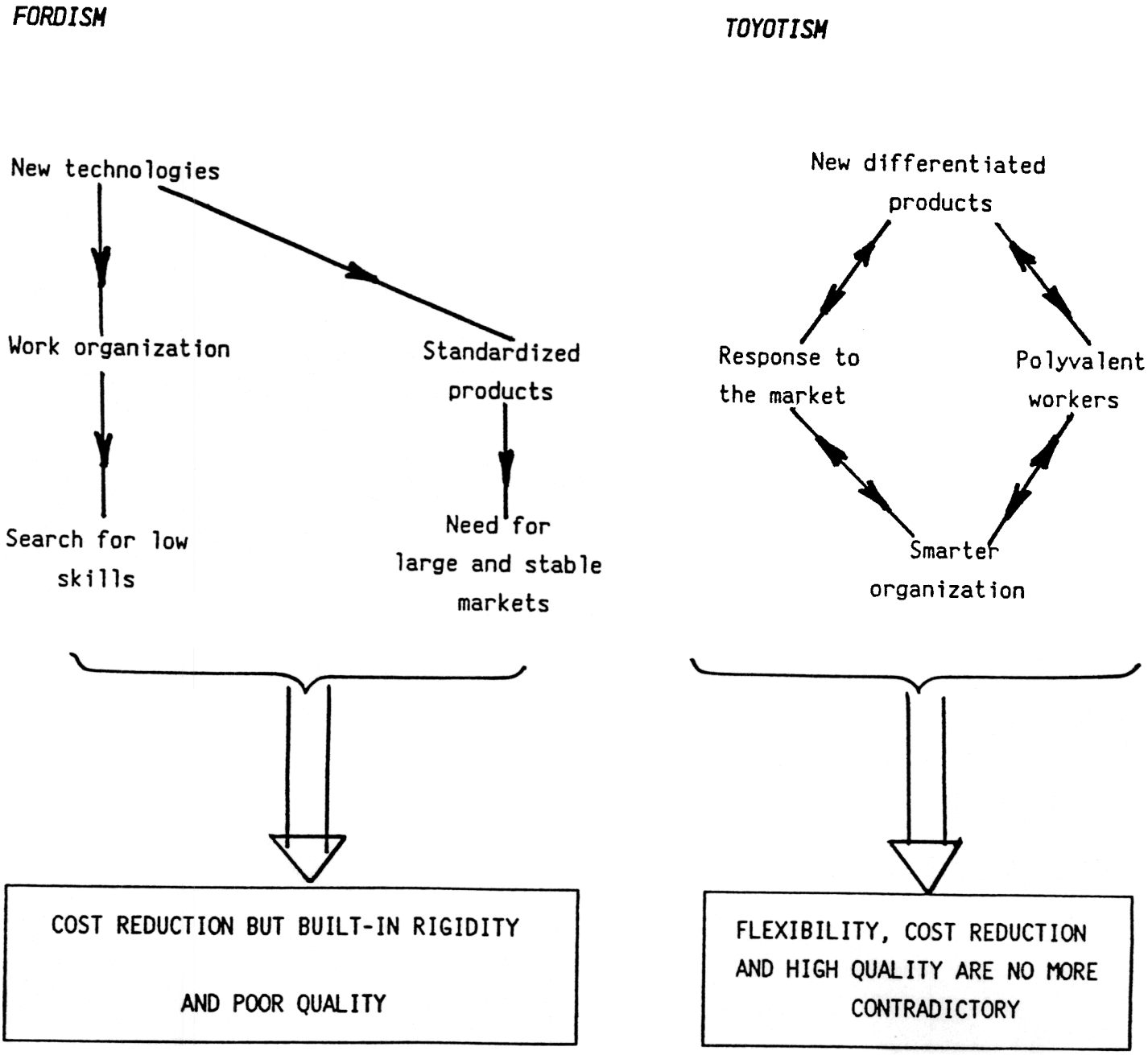
92. Most of the principles of the core model are satisfied in Sweden : very dynamic product and process innovations (P2), concern for global optimization of productive flows (P1), long tradition of innovative reorganization of the division of labour (from the KALMAR in the Seventies to the UDDEVALLA contemporary experiment) (P7). In regard to human resource policies, the training pursued by local and central authorities define a very active employment policy (Table 7), which implements an original configuration for the principle P10. It has to be pointed that the *social democratic compromise* plays an essential role in enhancing an offensive flexibility strategy [EDQUIST and GLIMELL (1991)]. Since a solidaristic wage policy and a very sophisticated welfare state prevents much wage differentiation or labour segmentation, innovation, productivity increases, and quality are the main objectives of the Swedish firms, which are internationalized but closely linked to the national financial system. There is a complementarity between the firmness of the capital labour relations and the built-in incentives to adopt any new model based on skills, high quality and oligopolistic pricing. A quasi full employment and the competition over skilled workers help too in sustaining the implementation of the new principles, both in manufacturing and in the service sector.

93. This is a good example of *functional equivalence* between the Swedish style and the Japanese one. Of course, they are embedded in to quite different systems : rather centralized but individualistic in Sweden, very decentralized but holistic in Japan. Again this is an argument in favour of the future of the new principles, since they can be combined according to different national flavours. Similarly, this management model is not totally homogeneous accross firms. For example, in the Swedish car industry, most of the plants still implement conventional assembly line and only weak group organization [EDQUIST, GLIMELL (1991)]. The long run economical viability of the more innovative experiment such as UDDEVALLA is still an open question. Nevertheless, experiencing new organizational forms is an essential feature to be allowed by any new model.

94. During the Sixties, the *learning effects* relied mainly upon manufacturing workers and possibly but to a minor extent upon the improved managerial knowledge (Table 17). This was one of the sources of increasing returns to scale. At the aggregate level, the correlation between total factor productivity and average growth expressed this mechanisms. It turns out that the corresponding regularities have broken down at the macro level after 1973 [BOYER and PETIT (1989)], but not at the micro level [AYRES (1985)]. Nevertheless the more recent estimates still exhibit a significant relation between productivity and growth for Japan, and possibly for France, even if the underlying mechanisms might be quite different [AMABLE (1989)]. In Japan, the learning has progressively extented from technologies to skills and then to procedures, structures and strategies [ADLER (1985), (1991)]. But in France, still prevailing fordist principles instead associate a better use of fixed equipments and labour when demand is buoyant (Table 17).

95. For a long period former *West Germany* has been characterized by a *diversified quality production* [STREECK (1989a)]. Quite rightly, PIORE and SABEL (1984) consider that this is a complete and coherent model, an alternative to fordism principles. But during the post world war II era, the division of labour and the employment of low skilled workers

FIGURE 16 : A SUMMARY : THE FORDIST AND NEW MODELS IN A NUTSHELL



has been pushed in order to satisfy a booming mass consumption. Nevertheless, the machine tool and a large part of the car industries continued to apply a quite different model based on craftmanship, high mobility of skilled workers [BERTRAND, KAISERGRUBER (1989)], and important learning by doing effects due to the commitment of workers (principles P7, P9, P10 and P11).

96. Therefore, in former West Germany, the new management style marks a return to a *long tradition*, in the new context of the international economy of the Eighties and given the new opportunities provided by micro-electronics and other technical innovations [LUTZ (1984)]. This might explain why PRIES and TRINCZEK (1991) insist upon conservative uses of these new opportunities : the managerial organization, the industrial relations and the engineering conceptions seem unchanged. Other specialists have noted the large continuities in former West Germany : the negotiations for a simplification of skills hierarchy, the introduction of new tehnologies, or reduction in work duration do not seem to have challenged the social and cultural system [SILVESTRE (1986)]. Of course, the reunification process now puts new strains...and provides fresh opportunities for the future of the german industrial model.

97. Technological and macroeconomic indexes indicate that other factors should be considered in an overall assessment (Table 16). If the Swedish and German firms are equally close to the new model, the productivity increases seem higher in former West Germany, for a similar growth during the periode 1983-1988. Paradoxically, Sweden invests more in R & D expenditures and implements more quickly flexible manufacturing. Still more, one of the major difference is related to exchange rate and external trade policies : former West Germany has maintained large trade surplus during the Eighties, whereas Sweden has preferred to maintain full-employment. This discrepancy focusses upon an important conclusion : similar management model might lead to *contrasted macroeconomic results* given the values of each society and/or the objectives pursued by their governments. No strict technological nor managerial determinism prevails.

98. This is precisely the key point about the notion of *national trajectories*. A given set of institutions, diverging strategic choices during crucial historical periods (for example the interwar period), the long inertia of cultural and societal values usually promote quite distinctive implementation of the same general principles. This has been the case under fordism [BOYER (1988a), (1989a)]. No clear reason explains why such *a strong national flavour* should vanish with the new management styles [PORTER (1990), MOSS KANTER (1991)]. All the previous analyses substantiate this provisional but important conclusion. Thus, some degrees of freedom are left to collective agreements between managers and wage earners, as well as to public policies.

§3. FORDIST NOSTALGIA : THE AMERICAN...AND FRENCH TRAJECTORIES.

98. In this third configuration, the new principles are embedded into the older fordist ones, without actually changing drastically the previous management principles. The future continues to be shaped by *some nostalgia* about the *golden age* of fordism. Therefore, it is a case of hybridation of assembly-line with electronic control, computerization with little skill up-grading in the services, on going mass production without significant product differentiation, continuing bridge between conception, production and marketing and so on.... A priori two countries at least, United States and France, even if quite different in many other respects, follow this pattern (Table 15).

BASIC COMMON PRINCIPLES BUT A LARGE VARIETY OF MANAGERIAL STYLES AND MODELS

TABLE 18 : A SUGGESTED TAXONOMY

LABOR PROCESS / LABOR CONTRACT	LARGE AND RIGID DIVISION OF LABOR (a)	LARGE AND RIGID DIVISION OF LABOR + AUTOMATION (b)	FLEXIBLE AUTOMATION + FLEXIBLE ORGANIZATION (c)	FLEXIBLE AUTOMATION + LEARNING BY DOING + TRAINING (d)
WAGE AND/OR EMPLOYMENT FLEXIBILITY (1)	TAYLORIST	FORDIST "T"	CALIFORNIAN	FLEXIBLE SPECIALIZATION
CONTRACTUAL WAGE FLEXIBLE EMPLOYMENT (2)	NEO-TAYLORIST	FORDIST "A"	NEO-FORDIST	PROUDHONNIAN COOPERATION
THREE COMPONENTS WAGE FORMULA WITH JOB TENURE (3) = (1) + (2)	REJUVENATED NEO-TAYLORIST	REJUVENATED NEO-FORDIST	SATURNIAN	"J" FIRM
THREE COMPONENTS WAGE FORMULA + MESO/MACRO TUNING (Job duration, wage funds employment banks, training and retraining)	SOCIAL-DEMOCRAT TAYLORIST	SOCIAL-DEMOCRAT FORDIST	SCANDINAVIAN	GERMAN

TABLE 19 : THE ROLE OF TRAINING INSTITUTIONS AND DECENTRALISATION

WAYS FOR GETTING COMPROMISE / TRAINING AND SKILLS	INTERNALIZED	EXTERNALIZED
DECENTRALIZED	MODEL "J"	SATURNIAN
CENTRALIZED	SCANDINAVIAN	GERMAN

So

Source : R. BOYER (1989a)

99. *United States* are a good example of the inertia in fordist principles. In spite of many efforts in high and medium tech industries [BUSINESS WEEK (1983)], including the car industry (SATURN project), the new model appears difficult to implement given the institutional setting (Table 9). First adversarial capital labour relations, even if declining due to the slow process of loss of influence by unions, put a brake to modernization. Second, the strength of financial short run objectives hinders the boldness of the strategic choice of industrial renaissance and implementation of a new capital labour relation. Last but not least, the poor performance of the education system does not help in engineering an upgrading of skills, competences and commitments [BUSINESS WEEK (1988)].

100. Nevertheless, careful comparisons between American owned plants with Japanese multinational subsidiaries within US suggest that this is not a societal weakness [ADLER (1991)]. A clever adaptation and translation of J model seems to have occurred quite successfully in the car and electronic industries (Table 10). But at the national level, all the benefits from the new model do not seem to have been reaped in the Eighties since many American firms have failed in introducing job security, employees involvement and good training [BROWN, REICH, STERN (1990)]. In the long run, may be the *very success* of the American system has been so pervasive all over the society that the new management model could never operate as strongly as it does for example in Japan. Mutatis mutandis, this would repeat the process observed during the previous century : the inability of the British society, then the first industrial nation, to cope with the second configuration of scientific organization i.e. the American system (Table 6).

101. *France* falls into the same category, even if the inner mechanisms are quite different. After WWII, fordism was mainly market enforced in US but was State driven in France (Table 1). These opposite characteristics are themselves related to the long run history in the implementation of capitalism in these two countries. Nevertheless, they share the same *inertia of fordist methods* embedded into deep social, political and even cultural configurations [D'IRIBARNE (1989), (1991)]. In France, the role of the State in the industrialization process, the prominence of large public orders over mass private consumer product markets, the usual opposition of unions to managers'initiatives, the strong split within the educational system between the selection of elites and the training of blue and white collar workers explain the difficulties in adopting the new management style. Of course, some large firms do succeed, but this is not a rapidly diffusing pattern. The prominence of invisible management tools associated with fordism (measurement of time, accounting practice, methods for cost evaluation, and investment assessment, and so on) [MIDLER (1986)] jeopardizes the diffusion of the new principles. These obstacles have clearly been diagnosed by various official reports and academic researches [DALLE, BOUNINE (1987), IRON (1990), FREYSSENET (1990), CEREQ (1989)]...But they are far more difficult to remove in actual management practices than in official statements !

102. This backward looking strategy probably explains that French macroeconomic performance has deteriorated in the Eighties in comparison to the two preceding decades. The diffusion of robots has been fast but slower than in Sweden and Japan. Productivity gains, which used to be very high, are no more superior to average OECD trends. Basically, a *poor structural competitiveness* has prevented the French economy to grow at a sufficient rate to curb down unemployment. According to a provisional hypothesis, these disappointing results are closely related to the difficulties of adaptation to the new principles in the French firms (compare Tables 15 and 16) [D'IRIBARNE (1990)]. Most firms continue to use new techniques and specially microelectronics in a very hierarchical

management style (Figure 16), quite in line with fordist principles and the French cultural values.

103. Thus, it might be erroneous to think that one unique and precise model will emerge all accross firms, industries and nations [BOYER (1989a), ANDERSEN (1990)]. Quite on the contrary mounting evidence emerges from the numerous researches by academics and from management literature : many national styles will probably co-exist in the long run. Previous researches about the capital labour relations suggest that the new organisation of work can evolve according to the different patterns [BERTRAND (1989), BRUNHES (1989)] and be combined with contrasted implicit or explicit compromise about job tenure, pay systems and social benefits (Table 18). Moreover, the same search for product differentiation and response to uncertainty can be dealt with either centralization or decentralization, training by firms or public vocational systems (Table 19. Therefore this opens new opportunities for public policies.

V LABOUR MARKETS, EDUCATION AND TECHNICAL CHANGE : WHAT SHOULD GOVERNMENTS DO ?

104. Public authorities can no more continue their previous policies without alteration : functional to fordism and a period of high and sustained growth, they might have become somehow *obsolete* in the context of the Nineties. In a sense, economic policy should aim at helping in the emergence of the new management model [SOETE (1991)]. But an objection has to be addressed at : if the adoption of the new principles is rather linked to cultural values or at least long run national trajectories, then what should be the policy in countries apparently far away from the purest form of the new model, for exmple from Japan ?

§1. A NEW EPOCH FOR ECONOMIC POLICIES

105. Imagine that firms realise that the new model is Pareto superior, and that each national government is conscious of this, and tries to implement this model. The basic issue is whether the adoption of a management style can be influenced by economic policy or recommendations and guidelines...which is far from obvious. For example, since the early Eighties, American officials try to upgrade the educational system...without apparently succeeding. Similarly, large corporations who have tried to implement some components of the J model do not seem to have obtained the expected results. Look at the mixed results associated with quality circles and just in time, considered as isolated reforms. May be the implementation of Japanese multinationals has been the major way for accomodating the new model to the American style and environment. Similarly, the British case provides a qualified view : in the electronics consumer goods and in the car industry, the replacement of national firms by subsidiaries of European and Japanese multinationals has been necessary in order to partially remove the obstacles associated with previous British management style and the industrial relations.

106. On the other side, the novelty of the issues of the Eighties has severely challenged conventional wisdom in economic policies. First of all, the focus upon demand management and fine tuning do not fit with the continuous internationalization of production, investment and finance. Therefore, governments should express major concerns for a *supply side* policy, which intends to deliver the basic requisites for national

or regional structural competitiveness : good general education, adequate training and retraining, excellent transport and telecommunication infrastructures, and of course a rich environment for basic and applied researches. Thus, previous trade policies sponsored by the GATT and centered upon exchange of goods cannot be complete substitute for *new rules of the game* about intellectual property, access to basic knowledge, conditions for foreign investment. For instance, benefiting from the spillover associated with foreign transplants might be more important than previous policies which used to favour "national champions". Finally, governments can use the public sector in order to favour the emergence and diffusion of a new management style. Of course, most of the related services are sheltered from foreign competition and do not benefit from any clear quality measure. Consequently, the bulk of the restructuring process is left to the firms, who need an aggiornamento equivalent to that experienced by governments.

107. The present analysis suggests that firms might fail for two opposite reasons, either looking at a golden age of fordism, or desperately trying to copy too distant models. The American and French cases have shown the danger of the first strategy. But conversely, it might be hazardous to strictly copy all the components of a given successful model, namely the Japanese one. Instead it seems better to try to imagine how the national institutions and the way for getting compromises betweem capital and labour allow the spirit and the general principles of the model to be incorporated into private and public management. For example, Japanese quality circles may be *the functional equivalent* of the German system for training skilled workers, whereas national collective bargaining in Sweden could be the counterpart of the profit sharing specific to the Japanese large corporations and so on. Of course, this supposes very innovative and subtle interventions from public authorities. They are specially difficult to find out since the time horizon of politicians is not that of innovative entrepreneurs. Adequate and genuine government initiatives might appear as right...or wrong only after one or two decades, quite a long period indeed ! In the transition from one regime to another, a strategic and long term view is crucial....but specially difficult to work out.

§2. A BIG PUSH IN EDUCATION AND A NEW "NEW DEAL"

108. Then, assume that the governments have none or few controls over the choice of the new model, or alternatively that *very different models* will coexist in the future. What should governments do in order to provide for dynamism the firms and deliver the best long run macroeconomic results ?

109. *Reforming education* is important indeed. On one side, more people have to have a general background in order to cope with fast changes and a larger integration between manual and intellectual components of any work. The quantitative objective of upgrading average skills has to be complemented by a redefinition of the content of educational programmes. It is now less important to accumulate a large amount of scattered knowledge and far more fruitful to *learn how to learn*. Many available studies about OECD countries, NICS and Third World nations point out that a good general education is a prerequisite to any growth strategy. The precise design of such a policy is out of the scope of the present paper, and has already been suggested by OCDE (1988).

110. Promoting a *new capital labour compromise* defines a second major objective. The case for public intervention is that adversArial industrial relations might lead to a dead end or at least to detrimental evolutions for society. Consequently, it might be important for

public authorities to help private actors to internalize *the long run and social consequences* of their short run economic optimizing behaviour. As a tentative example, if labour markets allow easy downwards adjustment in real wage, this feature may hinder the diffusion of labour saving innovations and promote low productivity trends, and consequently sluggish improvements in living standards [BUSINESS WEEK (1991)].

111. If on the contrary, strong unions ask for (and get) good wages and improved working conditions, then managers will be induced, if not forced, to innovate, to make labour saving investment and to launch new and high value added products. Even if in the medium run some unemployment problems may occur, as they still do in Western Europe, in the long run such a pressure can benefit living standards and jobs [BOYER (1991c)]. The German system gives a good example of such clever institutional arrangement, which mitigate the short run profit motive by obligatory networks. The worldwide admiration for the German *training organization* is the result of such compromise [STREECK (1989b), BUECHTERMANN (1991)]. Within the large Japanese firms, the compromise is only implict but induces loyalty and reduces the fear that better efficiency and technological advance will raise unemployment or reduce workers status [AOKI (1988)].

112. *Adapting economic policy* to this transition defines another suggested recommendation. Usually, monetary and tax policies are set according to short run disequilibria, with possible concerns for medium run objectives such as structural competitiveness and growth. During a period of transition, a third consideration has to be brought in : what will be the likely consequences of the actual economic policy for the managerial choices about new capital-labour relations and bargaining ? If for example, economic policy is changed frequently and unexpectedly, it will be hard to reap the benefits of the new principles, which imply long run commitment between workers and managers. Similarly, if monetary policy is too restrictive and keeps high real interest rates, then many firms will prefer the routine strategy i.e. a marginal adaptation of Fordist principles, instead of shifting to the new model [AMENDOLA, GAFFARD (1990)].

113. *Revise tax systems and incentives* in order to promote the neutrality of firms choices, whatever the form of their investment. By hysteresis, most of the actual systems benefit to productive physical capital, whereas only recently the rise in RD expenditures has been taken into account as a major source for productivity and the competitiveness. Still more, it is not evident that the existing subsidies and taxes are neutral with respect to the choice between human and material investment. Consequently it would be important to screen the actual institutions and policy interventions and remove any barriers which would be detrimental to training, education, investment in organization and so on [OECD (1988)].

§3. FOR A NEW INTERNATIONAL SYSTEM AND PRODUCTIVITY MOVEMENT.

114. The transition from one management style to another is not a purely determinist process. Quite on the contrary, it derives from a multiplicity of trials and errors, successes and failures at the local or regional level. By lack of adequate information or pooling of experiences, firms might repeat the same mistakes over and over. Thus, governments and international institutions could help to create *a network of social observatories* which would get all relevant informations about organizational innovations, whose diffusion could benefit other firms, industries and nations. This survey of technical innovations is usually worthwile for large firms. Again as proposed by the OECD (1988), a parallel effort should be undertaken about micro-meso and macro institutions which would promote

the implementations adaptation and diffusion of new management principles in various countries. This would be a renewal of the well known *productivity movement* which helped so much in diffusing the advanced techniques of American engineers and managers after world war II. This would open a huge area for investigation by the social scientists, interacting with managers'concerns and public policies priorities.

115. Clearly, such a wide diffusion of the collective good that are the new management principles supposes that all international trade frictions are over, which is far from being the case in the early Nineties. For instance, the surge of direct foreign investment, an important vector of the new productive model, could be blocked by creeping and ultimately open protectionnist measures. Therefore, the unequal diffusion of post fordism across Nations might, under adverse circumstances, end up into a major international crisis in the absence of any agreed and clear rules of the game. This would be a dramatic consequence for a structural transformation which would potentially benefit to the majority if not all countries. Again, one cannot refrain from a parallel with the interwar episode : the fordism finally succeeded in advanced countries after world war II ended and delivered a new and coherent international system. The current frictions between Japan, United States and Europe make clear that the success of post fordism will go along with the negociations of *a coherent international system*, which would include trade, finance, foreign investment and of course creation and diffusion of basic and apply knowledge.

116. Consequently, the old distinctions between micro and macro, national territory and the world arena, firms strategies and governments agenda, have experienced a major shift during the last two decades. All this paper is built upon the hypothesis that the new management principles will finally have major macroeconomic consequences and that conversely current international unstabilities might inhibit the diffusion and acceptance of these principles. This dilemma could only be solved by a renewal of cooperation between managers and wage earners, private sectors and public authorities, regional and national governments and the international institutions. This is a huge agenda for a new New Deal.

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