LABOUR AND TECHNOLOGY IN THE CAR INDUSTRY.

Ford strategies in Britain and Brazil

Elizabeth Bortolaia Silva

Thesis submitted for the Degree of PhD,
Imperial College of Science and Technology
University of London

May 1988

LABOUR AND TECHNOLOGY IN THE CAR INDUSTRY
Ford strategies in Britain and Brazil

ABSTRACT

This thesis looks at aspects of recent changes in international competition in the car industry. It examines the implications of the changes for the relationship between technology and work and it considers how strategies of multinational corporations interact with different national contexts. It is based on a case-study of the Ford Motor Company in its two largest factories in Britain and Brazil, Dagenham and São Bernardo.

Chapter 1 describes existing theoretical approaches to comparative studies of technology and work, criticizes technological and cultural determinist approaches and argues for a method that draws on a 'historical regulation' approach.

Chapters 2, 3 and 4 describe the long-term background and recent shifts in the pattern of international competition in the motor industry. In particular they look at important shifts in the late 1970s and 1980s and at Ford's changes in management structure and product strategy designed to meet these challenges.

Chapter 5 considers recent debates on international productivity comparisons and presents a fieldwork-based comparison of the production process at Dagenham and São Bernardo. The description shows the importance of issues other than technology in determining the flexibility and quality of production. In different national contexts,

different mixes of technology and labour can produce comparable results.

Chapters 6, 7 and 8 look at the national and local contexts of industrial relations in the two countries to throw light on the different patterns of change observed in the factories. Chapter 9 draws these sections together by looking at how different managerial strategies pursue common goals of quality, flexibility and productivity in different national contexts, and Chapter 10 suggests some of the more general implications of the work.

Contents

Chapter 1

LABOUR AND TECHNOLOGY: FROM DETERMINISM TO HISTORICAL REGULATION 11

1. The roles of technology and work 12
2. International and national regulations 22
3. The research strategy 32

Chapter 2

THE INTERNATIONAL CAR INDUSTRY UP TO THE MID 1980S 40

1. Earlier developments 42
2. The recent challenges 56

Chapter 3

COMPETITION AND MARKET PROTECTION IN BRITAIN AND BRAZIL 65

1. The car industry in Britain 65
2. The car industry in Brazil 77
3. An equal challenge for Britain and Brazil in the mid 1980s? 101

Chapter 4

FORD: STRATEGIES AND STRUCTURES IN BRITAIN AND BRAZIL 109

1. Shifts in global strategy 109
2. The structure in Britain 114
3. The manufacturing of new products in Britain 120
4. The structure in Brazil 124
5. The manufacturing of new products in Brazil 130
6. Ford-Britain and Ford-Brasil compared 135

Chapter 5

PRODUCTION PROCESSES AT DAGENHAM AND SÃO BERNARDO 137

1. The sites and the areas compared 142
2. Production processes for Body Construction 147
3. Production processes for Paint 181
4. Production processes for Trim and Final Assembly 192
5. The making of quality 209
6. Similarities and differences in the production processes: technology, employment, efficiency and quality 214

Chapter 6

INDUSTRIAL RELATIONS IN BRITAIN AND LABOUR ARRANGEMENTS AT DAGENHAM 220

1. The broader context of labour relations in the car industry 221
2. Industrial relations strategies at Ford before the 1980s 232
3. Lessons from Halewood and Austin Rover (BL) 250
4. Consultation on controlled and slow changes 255
5. Lower levels of employment, flexibility and avoidance of disputes 260

Chapter 7

INDUSTRIAL RELATIONS IN BRAZIL 266

1. The institutional framework of labour relations 267
2. The late seventies: breaking with old patterns 272
3. The early eighties: building a new industrial relations system 280

Chapter 8

SÃO BERNARDO: NEW PRODUCTION PROCESS AND INTERNATIONAL INTEGRATION 293

1. Changes with new technology. Democracy? 293
2. 1986: failures of the democratic project 309
3. Debt, multinationals, democracy and industrial relations 322

Chapter 9

FLEXIBILITY, QUALITY AND EFFICIENCY: THE ROLE OF JOB STRUCTURES AND EMPLOYEE INVOLVEMENT 329

1. Employment levels and workforce composition in the 1970s and 1980s 331
2. Trends and policies of labour turnover 337
3. Wage and job structures 348
4. The 1985 changes in industrial relations 353
5. The Employee Involvement Programme (EI) 362
6. Why different reforms towards flexibility 385

Chapter 10

CONCLUSIONS 392

Sources 398

Bibliography 404

LIST OF TABLES

2.1	Regional distribution of car production in the world, 1965-1980.	57
3.1	Development of the car industry in Britain.	72
3.2	Car production in Britain by company, 1975 to 1986.	73
3.3	Car production, exports and total new registrations in Britain, 1975 to 1986.	75
3.4	Development of the car industry in Brazil.	85
3.5	Car production in Brazil by company, 1975 to 1985.	87
3.6	Car production and exports in Brazil, 1975 to 1985.	94
3.7	Brazilian exports of Built-Up and CKD cars by region of destination, 1980 to 1985.	96
4.1	Industrial robots by application and total employment in Ford of Europe, 1979-1986.	113
4.2	Organization structure of Ford of Europe, 1986.	117
4.3	Management hierarchy, Ford-Britain, 1986.	120
4.4	Management hierarchy, Ford-Brasil, 1986.	129
5.1	Direct and indirect car workers by area, Dagenham.	145
5.2	Direct and indirect car workers by area, São Bernardo.	146
5.3	Employment of direct workers in Body Assembly, São Bernardo.	176
5.4	Robots and spotwelding distribution for Body Assembly - Sierra in Dagenham and Escort in São Bernardo.	179
5.5	Employment in the Paint shop, Dagenham.	182
5.6	Employment in the Paint plant, São Bernardo.	189

5.7 Employment of indirect workers in Trim and Final Assembly, Dagenham. 192

5.8 Employment per shift in Trim and Final Assembly Area, Dagenham. 196

5.9 Employment per shift in Trim and Final Assembly Area, São Bernardo. 198

5.10 Quality scoring of the Escort in São Bernardo, Halewood and Saarlouis. 213

5.11 Output per worker per day and other characteristics of the production process in Dagenham and São Bernardo. 217

6.1 Employment and output in the motor vehicles and parts sector, Great Britain, 1979 and 1985. 264

7.1 Employment and production at Ford, São Bernardo, 1980-1985. 286

7.2 Index of total car production and proportion of exports in the car industry and in Ford-Brasil. 286

9.1 Distribution of the workforce by grade and area, 1977 to 1985, Dagenham, Stamping/Body Assembly, and Paint, Trim/Final Assembly. 332

9.2 Hourly paid wage structure (grades and rates) by areas in Dagenham, November 1985. 334

9.3 Hourly paid wage structure (grades and rates) by areas in São Bernardo, November 1985. 335

9.4 Reasons for termination, hourly workforce, Ford-Britain, Companywide, Tax Year 1977/78 and 1978/79. 339

9.5 Hourly headcount, hirings, terminations, wastage rate and labour turnover. Ford-Britain and Dagenham site. 340

9.6 Percentage of terminations by grade and area, and hirings by grade over the hourly headcount, Dagenham, 1980, 1982 and 1984. 343

9.7 Headcounts, hirings, terminations, wastage rate and labour turnover. Ford-Brasil and São Bernardo site. 346

LIST OF DIAGRAMS

1	Underbody assembly, Dagenham, 1985	152
2	Body side assembly, Dagenham, 1985	154
3	Body frame assembly, Dagenham, 1985	155
4	Finish welding, Dagenham, 1985	157
5	Underbody assembly, Escort, São Bernardo, 1986	165
6	Body side assembly, Escort, São Bernardo, 1986	166
7	Body frame assembly, Escort, São Bernardo, 1986	168
8	Underbody assembly, Old models, São Bernardo, 1986	171
9	Body side assembly, Old models, São Bernardo, 1986	172
10	Body frame assembly, Old models, São Bernardo, 1986	173
11	Paint plant, São Bernardo, 1986	187
12	Trim and Final Assembly plant, Dagenham, 1986	195
13	Trim and final Assembly plant, São Bernardo, 1986	201
14	The managerial 'grid'	373

Acknowledgements

Financial support for the work on this thesis and my doctoral programme was provided by the Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) and the British Council. I wish to thank for his support my supervisor in the Department of Social and Economic Studies at the Imperial College of Science and Technology, Professor Roderick Martin. I am very grateful to the people at Ford-Brasil, Ford-Britain and Ford of Europe who gave me their time and enabled me to understand so much about their work. My knowledge and thoughts have also benefitted from discussions with the workers in trade unions in England and in Brazil, and those in trade union Research Institutes (TURU and DIEESE).

I enjoyed the support of José Ricardo Tauile, whose good contacts with management at Ford-Brasil opened doors to me. Leda Gitahy encouraged me with her willingness to see my work through and through discussions of her own studies. Helena Hirata opened to me the literature and introduced me to many profitable discussions with French academics, from whom I learnt a lot. Jane Barker provided me with a world of information, contacts and a lot of 'femininity' hints in this field of motor industry research. John Humphrey and Hubert Schmitz gave me helpful advice, opinions and information, sharing with me their research experience in Brazil and their good knowledge of British society.

Warm gratitude I address to my mother, Natalina Bortolaia Silva and to my father Onestino da Silva (com saudades). He was the one who first taught me about the fascinating bits and pieces of cars. I also want to thank my brother, sisters and friends, in particular Cecilia McCallum, who encouraged me a lot along the work. I certainly would have not come so far and fast without the support and love of Steve Tolliday. ♥♥♥

Chapter 1

LABOUR AND TECHNOLOGY: FROM DETERMINISM TO HISTORICAL REGULATION

How are the choice of technology and organization of labour related? How do both relate to levels of productivity and flexibility and international competitiveness? These sorts of questions have often been investigated by sociologists and industrial economists. But generally they have not only used very different methods by have also focused on separate aspects of these issues. Sociologists have often taken the technology for granted, and equally industrial economists have frequently neglected aspects of production as a social process. In either case, researchers have frequently found it hard to develop closely specified comparisons that enable them to pick out the most significant similarities and differences.

This thesis attempts to investigate these issues in a more precise way, integrating elements of the approaches of both sociologists and industrial economists and focusing on a clearly defined case-study - a comparison of two car factories, one British and one Brazilian, both owned by Ford Motor Company (FMC) - in order to illuminate why particular choices of technology and work organization are made, and what their implications are for productivity, flexibility and international competitiveness.

Studies of the relationship between technology and work have come to very different conclusions. These included:

1. Technology determines forms of work.

2. Culture, or other superstructural factors such as ideology or religion, determines forms of work, with

technology occupying a secondary role.

3. There is an interaction between technology and work, such that forms of work stimulate innovation or the implementation of technological change and technology requires particular forms of work.

Theoretical, methodological and ideological issues are associated with these conclusions. The tendency in the literature has been in the direction of an increasingly critical stance towards technological determinism, and the growing emergence of arguments stressing the interaction of technology and work. Such critiques have been greatly strengthened by international comparisons.

In this chapter the role of labour and technology and the use of national comparisons are discussed in three sections. The first section questions both technological and cultural 'determinisms'. The second section stresses the importance of systems of 'international regulation' in shaping national contexts, as well as the influence of national systems of regulation on the relationship between technology and work. The third reports the research strategy adopted for the investigation of Ford's strategies in Britain and Brazil.

1. The roles of technology and work

The main trends in studies of the relationship between technology and work have developed around debates on technological determinism. Technological determinations of work were emphasized in studies in the 1950s and 1960s which aimed to test the extent to which a pattern found in one society could be observed in others. This approach was

applied to case-studies of organizational structures, for example at national, enterprise or trade union levels. From these, universal laws of organizational functioning and structuring were postulated. A direct causal connection was described between technology and labour. It was assumed that specific technologies and equipment were connected to a specific form of work organization. These assumptions directed attention towards a convergence of industrial development across nations.[1]

A second trend, opposing such technological determinist views, emerged during the 1970s. This involved discussion of the dynamics of particular 'cultural contexts' as a basis for explaining differences between societies in terms of their divergence from some implicit pattern of universal rationality.[2] Explanations and interpretations of differences and similarities between the situations discussed were attributed to cultural differences. Culture was perceived to determine the patterns of usage of technology, work organization and management strategies.[3]

---

[1] See, for example, Woodward, 1958 and 1965; and Crozier, 1964 and 1973. These authors were aware that the social division of labour took different forms, but they were 'technical determinists' in that they argued that a single form of organization is most appropriate to the technological requirements of each stage of economic development.

[2] See, for example: Form, 1976; Gallie, 1978. In a second book published in 1983, Gallie shifts away from his earlier cultural emphasis and extends his analysis, emphasizing the roles of history and politics in determining cultural differences and explaining divergences in the political and industrial radicalism of French and British workers.

[3] In his study of Japan and Britain, Dore (1973) questioned the 'convergence thesis' in relation to the employment systems in the two countries. Although he gives great weight to cultural factors he primarily explains Japan's

National comparisons were central to the development of these views opposing technological determinism. However, national contexts tended to be seen as hegemonic and relatively insulated. Common historical 'rationales' of developments in technology, innovation, or industrial relations strategies across countries were generally neglected.

It is helpful to focus on two recent studies to illustrate 'cultural' interpretations of the relationship between technology and work. The first is Duncan Gallie's (1978) study of oil refineries in France and Britain. The second is Ian Maitland's (1983) work on the sources of 'industrial disorder' in a British and a German rubber factory.

Gallie's work emphasizes 'cultural' factors most strongly and is developed as a refutation of technological determinist studies. The works of four authors - Robert Blauner (1964), Joan Woodward (1965), Serge Mallet (1963) and Pierre Naville (1961) - provide the target against which Gallie argues.[4] The view that technology determines relations within the enterprise and that technological modernization changes these relations is shared by these four authors. They differ, however, in their opinions concerning the adaptation of workers to the structure of

---

particularity as a result of a 'late-development effect', emphasizing the historical background in each country. Dore's work does not focus on technology or the labour process, but its historical/cultural line of argument is similar to some of the arguments of Gallie and Form.

[4] Gallie's overview of these authors is based on: Robert Blauner - Alienation and Freedom, Chicago, 1964; Serge Mallet - La nouvelle classe ouvrière, Paris, 1969; Pierre Naville et al - L' automation et le travail humaine, Paris, 1961; and Joan Woodward - Industrial organisation, London, 1965.

the enterprise. For Blauner and Woodward automation (or any technological modernization) is conducive to consensus over the social organization of the enterprise. Conversely, for Mallet and Naville, automation encourages workers to challenge the prevailing structure of power within the enterprise and society.

Gallie's aim is to show that the extent of social integration of the workforce is not determined by the kind of technology utilized. The main idea that he contests is that the critical determinant of working class consciousness is the evolution of production technology. Even if technological developments make possible changes in working class consciousness, there is no necessary reason why it should create consensus within the firm and society (Blauner and Woodward's thesis), rather than increase opposition to such structures (Mallet and Neville's thesis). Gallie argues that technology per se does not have either one or the other consequence.[5]

Gallie's thesis is that the nature of social interaction within the enterprise is determined instead by the wider cultural and social structural patterns of specific societies.[6] His research is based on four case-studies 'involving almost identical technology'. Two refineries, one in France and the other in Great Britain, present traditional processes; the two others, also one in France and another in Britain, have modernized processes. Although variables concerning differences in production processes, such as modern and traditional equipment, are taken into

---

[5] Behind these explicit ideas is Gallie's implicit opposition to marxist assumptions that workers' experience of work moulds their wider attitudes towards the society in which they live.

[6] Gallie, 1978, pp. 317-318.

account in the selection of the research sites, they are not subsequently included in the body of analysis.

Since for Gallie technology is not an important variable in the industrial relations system prevailing in a given society, the usage of either advanced technology or traditional technology makes no difference to the degree of social integration of the workforce or, conversely, to the development of a revolutionary consciousness. Despite his comprehensive examination of the whole system of industrial relations which affects work in highly automated companies, Gallie finds no connection between the industrial relations system within the firms he researches and their labour processes. He denies technological influences upon social structures, stressing that what occurs within the highly automated sector could also occur within any other sector.

In contradiction to his assumption that there is a similar pattern of industrial relations in the four case-studies, Gallie finds differences in wage structures, in work organization, in control systems, in management structures, and in the trade union structure. These differences might be expected to lead him to the conclusion that the industrial relations system within each firm was designed to fit the firm's own competitive needs, for example in labour and product markets, output requirements, or the nature of its machinery. Instead, Gallie describes these differences in industrial relations as the result of differences in French and British 'cultural environments'. Although important variants in the behaviour of each firm are observed, they are ignored in the core of the analysis.

This indicates the author's failure to link the 'broader cultural and social structural factors' to the role of

'technology' in society. The analysis of the effects of a specific kind of technology need to go beyond an examination of the factors influencing decision-makers, and the attitudes and aspirations of the workforce, as if they did not interact both with the structure of the societies to which they belong, and with choices of production processes.

The 'structure of managerial power' and the 'nature of trade unionism' are the most important elements in Gallie's analytic framework. Although these factors are important, they do not have the same importance for different societies. For instance, Gallie affirms that the attitudes of the workforce can be very different in 'cultures' where political parties have a stronger role than management in unions' affairs, but he attributes equal weight to these issues in the two countries, when their particular history requires other instruments of measurement.

Gallie's ommissions underline the need to look at technology as an aspect of the social relations of production. Gallie looks at technology as machinery alone, completely dissociated from the social relations taking place in the factories. But, technology in fact includes the social organization of production and the labour process and involves much more than machinery. The way of examining technology changes once it is recognized that it is affected by - as well as being a product of - prevailing social, political, ideological and economic circumstances.

The importance of Gallie's book lies in its recognition that the culture and social structure of society must be considered in any attempt to understand the impact of a

specific kind of technology in a particular society.[7] This was valuable in the context of criticizing the 'technological determinism' of Blauner and Woodward or of Mallet and Neville. However, Gallie's criticism led him into a trap. In avoiding technological determinism, he excludes technology - in its wider sense - from his framework of analysis, falling into a cultural and social structural determinism.

A comparable study which illuminates other aspects of these approaches is that of Maitland. Maitland does not emphasize 'culture' in the same way as Gallie. He adopts a 'structural' explanation for what he calls 'industrial disorder' in Britain and analyzes historically union structures and collective bargaining in post-war Britain and Germany pointing out the links between different national structures of bargaining and systems of workplace control. He concludes that wage inflation and industrial disorder are a consequence of the structure of British labour relations, which is partially responsible for the country's relative economic decline.[8]

Although Maitland conducted empirical research in two factories of an international tyre manufacturer, (one in England, one in Germany), with the aim of analysing different levels of productivity, he does not link the specific conditions of production in the factories and the historical explanation he develops concerning the analysis of national patterns of labour relations. The latter are the central issue, the former a background support for validating the assumption that there is a discrepancy

---

[7] The same must be said of the works of Dore (1973) and Form (1976).

[8] Maitland, 1983, p. 15, Ch. 3 (p. 32 to 47), and p. 119.

between the values (or attitudes) and behaviour of British workers.[9]

Maitland's approach is based on that of Talcott Parsons and a critique of three frameworks for 'explanations of disorder': neo-durkheimian, collectivist, and marxist.[10] Parsons developed a structural framework for the analysis of social action by putting together the key elements of Durkheim and Weber's sociological theories.[11] Using this framework Maitland concludes that all three approaches neglect processes at the micro level, i.e., on the shopfloor. He argues that his study shows that 'micro-level actions may interact in such a way as to produce an outcome desired by no one.'.[12]

Maitland shows that links exist between shopfloor actions and broad national systems of labour relations. Nevertheless, the way he works out the contrasts between the two factories is disappointing. Within his adopted Parsonian framework the control of the case-studies must be precise in order to clarify the sources of difference. In order to achieve such comparability, he excessively emphasizes the similarities between his factories and their

---

[9] Maitland, 1983, p. 13, and the full discussion in Ch. 4, pp. 48-72.

[10] Maitland's overview of these approaches is based on:(for the neo-durkheimian perspective) John H. Goldthorpe- 'Social inequality and social integration in modern Britain' in D. Wedderburn, Poverty, Inequality and Class Structure, Cambridge UP, 1974; (for the collectivist perspective) Samuel Beer, British Politics in the Collectivist Age, Vintage, New York, 1969; (for the marxist view) Leo Panitch, Social democracy and industrial militancy, Cambridge UP, 1976.

[11] See Parsons, 1968.

[12] Maitland, 1983, p. 108. Parsons, 1968, refers to this phenomena as 'intended actions' and 'unintended consequences'.

economic contexts. The countries are presented as having similar size, endowment of natural resources, stage of industrial development, dependence on foreign trade and industrial structure. Important differences such as the very different rates of unemployment find no place in his study. Germany's superior economic performance is seen as a result of social and political rather than economic factors.[13]

When he finds higher levels of output per worker in the German factory he stresses that the differential cannot be explained as the result of differences between managements, technology, or even workers 'because the factories are similar or identical in all these respects'.[14] However, in his description of the factories a few pages before this statement he describes how the English one was larger, had much greater product differenciation, more complicated production scheduling, and a workforce six times larger. In terms of the workforce, moreover, he had also noted that the English were older and had longer service, whereas labour turnover (caused by management dismissal of workers) was higher in Germany: half of the workforce was foreign-born (with 'visitor' status in the country), compared with 30% foreign-born (but permanently settled) in England. These issues are not incorporated in the analysis because his analysis remains at a super-structural level. He discards these differences as significative and adopts a very narrow view of labour relations based on institutionalized bargaining processes (formal or informal).

Both Maitland and Gallie disconnect their studies of labour

---

[13] Maitland, 1983. p. 19.

[14] Maitland, 1983, p. 30.

relations systems from the specific labour processes. Methodologically, both of their 'culturalist' approaches, like the technological determinist approaches which they reject, are embedded in the notion that it is possible to measure the same type of issues by the same parameters in different societies. In this way, the same selected 'variables' are compared one by one in each national context. Discontinuities and different meanings arising in different situations are considered either as anomalous diversions from the postulated pattern or as the result of different 'cultural contexts'. Variables are derived from formal and general concepts. As a result of this method the links between the structure of the society in which the organization studied is embedded and the organization itself is ignored, as are the ways societies create their own culture, how social structures create institutional organizations, how these developments are historically determined, and how national contexts are part of the international context. Social structure, culture, history and relations of interdependency appear basically as an 'ex-post' 'result' of the investigation.[15]

The first approach we have discussed would, for example, conclude that work organization in the car industry in Britain is different from Brazil because the type of technology used differs. The second approach would point to a comparison between Britain and Brazil which would test the influence of social structure and culture by isolating variables like industrial structure, technology, product, size of the establishment. If these variables were held

---

[15] For a discussion about the implications of technological and cultural determinist approaches see: Negandhi, 1973; Monjardet, 1979; Hirata, 1983; Maurice, 1986; and Grootings, 1986.

'constant', the 'impact' of socio-cultural factors (education, religion, social background of workers and managers, etc) on the organization could then be assessed. In this case, the latter factors would 'explain' the differences in individual 'cultural contexts'.

2. International and national regulations

The main merit of approaches emphasizing the role of culture - and national diversity - is the demonstration that a strict
relationship between technology and work does not exist. Considerable variation in work organization has accompanied similar technological developments.

The discussion of the work of Gallie and Maitland has shown that plants using similar technical equipment, and located in different countries, have different organizations, wages, skill and work assignment structures. However, if they have succeeded in demonstrating the diversity, they have failed to observe what the different cases have in common.

An example can clarify the implications of this critique. If a particular kind of equipment requires unskilled labour, this is a requirement from the general pattern of production dominant in the industry at the time. If unskilled labour works longer hours or is paid less in one particular geographical region than another or if unskilled workers are better trained, or more reliable than the machines, this may well be a result of different cultural, social, political and economic circumstances. However, the requirement of unskilled labour for those particular operations relates to a logic beyond the national

boundaries.

This raises two sorts of implications. The first is that the division of labour is not a purely technical issue. The second is that the operating demands of a specific technology can be flexibily decided. Nevertheless, the existence of room for technological and organizational choices - the decisions about division of labour, or the ways in which the technology is operated - are limited by the social system and the dynamics of social relations that flow from the implementation of such choices. These social relations are conditioned by the character of the business and its historical context.[16]

The causes and outcomes of such 'choices' depend on two major issues. The first is the decision making process and its consequences including the generation of new demands. The second is the context at the level of the firm, the nation and the international system. These issues are connected because the decision making process and its outcomes are intrinsically related to the specific form of articulation of the firm, nation and international system. Both are rooted in the process of competition.

The competition process continually leads to new approaches to production, and hence changes the social conditions of production.[17] It is useful to discuss these changes under four main headings.

1. The dominant pattern of production at the time.

---

[16] Cf. Child, 1973.

[17] A good theoretical debate concerning the factors involved in the process of capitalist competition can be found in Wheelock, 1983 and 1986; Bryan, 1985 and 1986; and Burket, 1986.

2. The extent to which the firm is embedded in this production pattern.

3. National state policies regulating competition and production.

4. The relationship between workers, management and the state.

The discussion of competition in the car industry in Chapters 2 and 3 follows these lines.

In most theoretical formulations of the process of capitalist competition, a firm must, under threat of bankruptcy, impose new forms of division of labour on its employees, regardless of their resistance. This is particularly so when competitor firms have already reorganized their methods of production. In this way, both technology and work organization result from the general conditions of international and domestic competition prevailing in the industry. They are also shaped by three interacting levels of power relations: the shopfloor, the state, and the international division of labour.[18]

Breaking down the elements involved in national comparative analyses of technology and labour, and specifying the factors upon which choices in social conditions of

---

[18] For example, Freyssenet (1979) develops an approach differentiating 'general', 'particular' and 'concrete' conditions, as levels at which to examine the interaction of different levels of power. He analyses the relationship between the division of labour, industrial relocation (travel-to-work issues), and the daily mobilization of the workforce on the basis of case studies of Renault in France and Fiat in Italy.

production depend, provide a focus for considering the problematic character of the articulation between these three levels of power relations.

However, in order to develop a consistent methodological approach to the analysis of labour and technology in national comparative perspective it is not enough simply to recognize that such relations are free from determinism, and that different dimensions of social structures are brought together in the establishment of these relationships.

One framework that sheds light on how the various dimensions of analysis are integrated and related to broad social structures is provided by the recent and somewhat divergent 'regulation' approach.[19] This perspective is useful for understanding patterns of articulation between the national context, international competition and the decision making process of firms. Contrary to determinist views the regulation approach postulates that a 'universal', or general logic exists, but that each society generates, out of its own capabilities and resources, its own process of adaptation and change.

The regulation approach is concerned with the historical process of the transformation of societies and the logic of their development. It opposes both the neo-classical idea of 'general economic equilibrium' and the orthodox marxist conception that the development of the forces of production is the principal determinant of capitalist evolution.[20]

---

[19] The 'regulation school' has developed over the last ten years particularly amongst French economists and political scientists. See: Aglieta, 1979; Lipietz, 1982; Boyer, 1986.

[20] See, in particular, Aglietta, 1979.

Within the social sciences the general equilibrium conception of economists has its counterpart in the functionalist assumptions of 'dynamic equilibrium' as the basis of social change. In this approach the assumption is that when social equilibrium is broken 'anomie' results. Societies then naturally seek to eliminate 'anomies' so as to return to their natural equilibrium and harmony. The alternative structuralist view is that the basis of social dynamics rests on the evolution of the forces of production. Although there are differing conceptions of the agencies of social change, both functionalist and structuralist approaches agree that social structures are the product of laws and movements that are independent of society and are not changed when social structures are modified by their operation.

Conversely, for the regulation approach social changes result from the 'reproduction' and 'rupture' of the social system. 'Reproduction' is the process which permits what exists to go on existing, and 'rupture' is the necessary transformation of the existing state of things to permit the emergence of the new. Whithin this framework, technology is conceived as an outcome of the social forms of production and reproduction. At the same time, technology is an important factor in the production and reproduction of social forms.[21] Hence, technology is an element wholly endogeneous to society.

Regulation theorists stress that production is a structure in motion, and that the fundamental relation of production is the wage relation, by which they mean the whole complex of juridical and institutional conditions which govern the

---

[21] See Aglietta, 1979, pp. 112/3.

use of waged labour and the reproduction of the labour force.[22]

Changes in the labour process imply changes in the wage relation, i.e., in how labour power in the wage system is used in production. Wage relations are seen to have changed under the dominance of Taylorism and Fordism, and are now undergoing a transformation under Neo-Fordism.

Taylorism accelerated the mechanical cycle of movements on the job and increased the continuity of work in the working day. Its principles of work organization reduced workers' autonomy and increased the privileged status of supervision. Under Fordism, two elements were added to Taylorist principles: the semi-automatic assembly line and a new form of labour management.[23] The system of conveyors and handling devices for the movement of materials and their delivery to the appropriate machine tool resulted in major savings in labour-power. The labour process was converted from a dense network of relationships between jobs to a straightforward linear integrated flow. Workers tasks were closely defined and even more rigorously determined by the machine system.

Neo-fordism has changed the principle of work organization towards the recomposition of tasks in a context of automation or automatic production control, frequently combining this with job enrichment schemes in which

---

[22] This definition is given by Boyer, 1986, p. 18. He stresses that the wage relation comprises five elements: 1. The (technical) organization of the labour process. 2. The skills hierarchy. 3. Workers mobility patterns (inside and outside the firm). 4. The principles of direct and indirect wage formation. 5. Patterns of workers' expenditure of their incomes.

[23] Pastre, 1983.

increased employee involvement is sought.[24]

Although its main lines of analysis have been developed in relation to general transformations of the wage relation at the level of international capital, the regulation approach has been mainly applied within the framework of the nation. The international dimension of regulation has received little attention.[25] According to Aglietta,[26] the main constraints on the study of the expanded reproduction of capital across societies internationally is that such a study demands a knowledge both of the general tendencies of capitalist development within the different nations as well as careful attention to the relations between states.

Nevertheless, the general tendencies of capitalist development provide the basic determinants across nations which share the same capitalist mode of production. The capitalist mode of regulation involves the reproduction of the wage relation through the process of competition between capitals. This results in a further difficulty for

---

[24] This outline of the historical development of the wage relation is presented in Aglietta, 1979, pp. 113 to 130. Coriat, 1984, argues that the mode of production involving microelectronics represents a continuity of the Taylorist principle of production organization. He argues that Taylorism reached a limit as a technique for reducing production time, but that microelectronics has allowed this limit to be overcome.

[25] For exceptions, see: Boyer, 1986, who attempts to develop a comparative and broader international logic. C. f. also Nöel, 1987, who discusses the work of J. Mistral ('Competitivité et formation du capital en longe période', in Economie et Statistique 97, February, 1978) in which national patterns of accumulation are investigated. Mistral shows how the current international competitiveness of each advanced capitalist economy can be linked to long-run national trends in investments and real wages.

[26] Aglietta, 1979, p.22.

the regulation approach in extrapolating its framework beyond national levels. However, the limitations of the regulation approach are not confined to the absence of a suitable framework of analysis for competition. A critique on this level alone would be too abstract.

In a recent discussion of the theoretical and empirical works of French regulationists Nöel (1987) compares the central arguments of the regulation approach with those proposed by two other approaches in economics: neoclassical institutionalism and segmented labour market theories. He considers that the importance of the regulation approach lies in two of its theoretical outcomes. The first is that the regulation approach breaks with both the idea of constant laws of capitalism and with static equilibrium theories. The second is that it permits the integration of social and political dimensions making possible a dynamic theory of political economy.[27]

Nöel also points out the need to clarify and explain some concepts and processes used within the regulation perspective. In particular, he argues that a central point of regulation theory which is insufficiently developed, is the idea of the indigenous character of economic crises and the reproduction and recreation of stable structures. He argues that the understanding of the dynamic of changes requires further theoretical and methodological refinements and that more research needs to be done to establish causal relations adequately.

---

[27] Burawoy, 1985, undertakes an empirical application of the main concepts of the regulation approach. He adds a political dimension to the understanding of the economics of production, and argues that the subjectivity of the working class is the object of politics of production because it is essential for the production of consent.

Despite such deficiencies, for the questions this thesis addresses, the regulation approach appears more satisfying than the other perspectives available. But, the framework offers insufficient guidance in some crucial research questions.

Firstly, because of the dynamic perspective of the regulation approach, it has been possible to treat economic, social and political variables as equally relevant. Because production is not considered as an isolated factor in society, but is studied in relation to demand - and therefore to wages, purchasing power, inflation, debt, and economic policies of various kinds- economics and politics are theoretically linked at the level of the nation and the international system.[28] At the level of the nation these links take the form of problems of productitivy and industrial relations. Internationally they take the form of trade policies and their consequences for different nations, or in the challenges posed by the debt crisis to monetary institutions worldwide. However, the key variations across time and countries dealt with by the available regulation studies deal mainly with the economic level. In this way, the possibility of including variables other than economic remains at an abstract theoretical level. An integrative methodology has still not been developed.

Secondly, an advantage of the regulation framework is its

---

[28] Working within the regulation approach, Guerra Ferreira, 1987, in his study of the economics and labour process of the Brazilian steel industry, finds that regional and national conditions of production and labour organization have a considerable influence on the adaptation of internationally dominant socio-technical norms of production.

long historical perspective. However, this results in the absence of a consistent framework for the understanding of contemporary relationships, once historical analyses are not the core of the study. In part, this is due to the newness of the approach of regulation. One consequence is that without re-theorizing the history of each country concerned, one is left guessing about how different histories would fit the abstract concepts developed by regulationists.

Thirdly, the regulation approach makes possible analyses of national patterns focusing on their uniqueness. No pattern of convergence is pre-determined, no necessary relations emerge from any particular social configuration. In some senses this brings even greater anxieties to the researcher, and leaves no firm ground on which to build. Free from any determination, the regulation approach makes recognition of the crucial variables in each case-study more difficult. Its guidance is looser than more determinist theories. Starting from the idea that no previously-determined outcome exists, the regulation approach stresses the importance of choices. But such choices are not voluntaristic. Rather they are conditioned by the interests in conflict in a historical situation.[29] Perhaps this also brings to the researcher one of the greatest joys: the possibility of more creative and challenging work.

---

[29] In Nöel's view (1987), regulationists have failed in to define the 'logic of choice', making a theory of change impossible. But, contrary to his views regulation studies argue that existing structures carry permissive conditions from the past. 'Reproduction' and 'rupture' define the logic of choice by defining the possibility of accomodating divergent interests.

3. The research strategy

This thesis compares recent car production strategies in Britain and Brazil looking at the respective national contexts in which the motor industry has developed, and at the operations of an American multinational company - Ford - which has subsidiaries in the two countries.

Since the 1970s three linked features have come to the fore in new conceptions of production strategy in the motor industry: product development, new technology and work organization. The core of the competitive process has been to achieve the maximum flexibility in production plus higher product quality by combining these three features.

In the 1980s the implementation of these new aims is widespread in the major manufacturing sites of multinational car companies. The methods of implementation, however, are adapted according to the particular conditions of different countries.

In order to give an account of the contribuition - and place - of particular national contexts in this general industrial production strategy, a theoretical framework with a dynamic perspective appeared essential. The subject was an American multinational operating in a very competitive world environment, in two countries which differed enormously. The countries' positions in the international division of labour offered plenty of material for constrasts on the basis of opposites such as 'industrialized', 'developed', 'rich', for Britain, versus 'industrializing' (Newly Industrialized?), 'developing' (under-developed?), 'poor', for Brazil. Numerous stereotypes are linked to such 'country-types', and it would be tempting to conclude either that the countries are

not comparable or that any comparison would be simply insipid.

In 1983 Escorts produced at Ford's plant in São Bernardo were successfully exported to Scandinavia, until then a market exclusively supplied by Ford's British and West German manufacturing subsidiaries. This was a new market strategy derived from Ford's worldwide production strategy. This event, even though it remains unique, has demonstrated that there are new issues bringing British and Brazilian car production strategies closer than ever. In addition, developing countries present such contradictorily combined forms of development that they can only be understood if the particular development of the modern sector of the economy is acknowledged to have a logic of its own. The interests of the modern sector are often closer to those of developed countries than to those of less developed sectors in the same country.

The perspective of dynamic relationships derived from the regulation approach would require an extensive account of the history of Britain and Brazil and their relative positions within the international division of labour. On the other hand, the contemporary character of the research questions required a central focus on the investigation of production strategies. Choices had to be made which involved leaving aside a long historical perspective to focus the study on developments in the 1980s. Hence the historical background is based on secondary data and investigation to provide a context for the analysis of recent developments in production strategy - involving technology and work organization. Data concerning recent strategies were collected by fieldwork in the British and Brazilian subsidiaries of the Ford Motor Company, at the Dagenham and São Bernardo sites.

The methodology for this study was defined in relation to both the key recent developments in the car industry, and the opportunities for effective fieldwork.

Access to secondary data was easier in Britain than in Brazil. This reflects differences in national statistical systems and in the general availability of information partly reflecting wealth (for the production of statistics) and partly democratic participation (with reference to the use of information and citizens' rights to be informed).

These differences in access to data are features of both the countries and the company subsidiaries. For instance, company statistics made available to trade unions in Britain at the time of Pay Claim negotiations have included: 1. The cost structure broken down into percentages of wages, salaries and benefits over total sales. 2. Productivity measured as vehicles per worker, and production schedules by car model. 3. Earnings and labour turnover analyses including cross tabulations by grade, gender, site and plant. 4. International comparisons of average earnings and working hours with other European plants.

Information like this has never been available to the union in Brazil. Before 1979 even a request for such information was unthinkable. Although requests before Pay Claim negotiations have become a normal procedure in the 1980s, comparisons with other subsidiaries elsewhere in the world, or data referring exclusively to Brazilian operations such as cost structure, productivity, production schedules and disaggregated data on the wage structure and hiring and firing policies have not been provided to the union.

Even though disclosure is wider in Britain than Brazil, the unions still often have their requests refused or else receive indecipherable replies, which are of no use for their purposes.

As far as researchers are concerned these different ways of making company information available affect what managers are allowed to disclose. Certainly what is disclosed to the unions would not necessarily be disclosed to researchers and vice-versa. Mostly, however, information is equally hidden from both agents. Disclosure of information is a significant indicator of management-worker relations and is itself an important issue within the framework of research.

In contrasting ways, access to the sites was also very different in the two countries. Access to the Ford factories was harder to arrange and much more restricted in Britain than in Brazil.

The major differences in the fieldwork on the two sites were:

1. The research time in the Brazilian site was highly concentrated in one main period and a second, also concentrated, shorter period one year latter. In the British site the fieldwork was widespread over two years, with several short concentrated periods.

2. The production processes in Brazil were fully covered, whereas in Britain some areas remained not properly investigated.

The fieldwork on site was organized via management. I was not asked by management in either country if I would be interested in the union/workers' views. I believe this

managerial approach helped in getting access and finding out about management strategies. But, the fieldwork would have been very incomplete if the company's views had not been complemented, in both countries, by extensive interviews with trade union representatives. Due to the very different national trade union structures and internal systems of workers representation, appropriate worker representatives come from rather different positions in the unions. In all union interviews I was asked about my contacts with company management.

The research needs dictated many of the research strategies untertaken. In general the approach was one of discovery, curiosity, and an open mind. Issues were broader at the beginning than they became at the end. Certainly my personality, gender, care with personal appearance according to the fieldwork context, work experience, and nationality, amongst other issues, have influenced fieldwork results. In relation to the comparison between the two countries it appears relevant that I lived in England throughout the time of this research and was able to 'get a feeling' of my object of study. Being Brazilian my 'feeling' for the Brazilian case was more accurate from the beginning. Moreover, besides my academic studies, I had worked for almost seven years in the principal trade union research institute in Brazil (DIEESE). I had also had one year of experience as an employed sociologist in the biggest nationally-owned Brazilian metal components (auto-parts) company, before starting this study. From these professional experiences I came to know the insides of collective bargaining and labour-management relationships. My relative familiarity with Brazilian aspects of this research may be evident in the results, compared to my struggles, at times, to come to terms and understand complexities of the British reality.

The result of this fieldwork process and analysis is presented in this thesis in ten chapters.

Following this introductory chapter, the next three chapters are focused on the car industry.

Chapter 2 is concerned with the historical development of the industry and stresses the challenges in the 1980s which produced the strategies that are the main object of this research.

In Chapter 3 the historical development of the car industry in the two countries is discussed. The patterns in Britain and Brazil differ in many ways. The complementarity began when car production started in Brazil, in the mid 1950s, but, it became closer only with international competitive trends in the 1980s. In the light of the recent international challenges to the car industry, the question of the similarity or otherwise of challenges facing Britain and Brazil is discussed.

Chapter 4 turns to the strategies and structure of FMC considering its international strategies and their particular development in Britain and Brazil. The perspective is historical, but the 1980s, with automation and the associated internationalization of production processes and products, are the main focus.

In Chapter 5 I consider recent debates on international productivity comparisons and provide detailed descriptions of the production processes for the main car manufacturing areas. The chapter describes the changes introduced in the sites of Dagenham and São Bernardo. The actual implementation of Ford's production strategy (as defined

in Chapter 4) is examined and the technical differences in processes and products are pointed out on a process by process basis. Similarities and differences found in the production processes in each site are analysed. Employment levels and structure, efficiency and quality levels are studied in relation to the technical equipment in use. Some of the broader problems involved in comparisons of international productivity are also discussed.

In Chapters 6, 7 and 8 the industrial relations systems in Britain and Brazil are discussed. The broad national systems provide the general context for the pattern of industrial relations in the car industry, and in particular those of Ford. In these chapters the period preceding the introduction of new technology in Ford's subsidiaries provides the background for the analysis of changes related to the company's general strategies and production process that were considered in the previous chapter.

Chapter 6 outlines the main features of the British system of industrial relations, covers industrial relations strategies at Dagenham in relation to the changes implemented elsewhere in the British car industry, and looks at the development of strategies followed by Ford, and at the outcomes at Dagenham up to the present.

Chapter 7 provides a detailed analysis of the Brazilian industrial relations system, providing a context that may be unfamiliar to researchers acquainted with the British industrial relations system and which has many sharply contrasting features.

In Chapter 8 labour arrangements at Ford in São Bernardo are discussed in relation to the Brazilian democratization process that followed 21 years of dictatorship. Some links

are pointed out between trade policies, financial debt and Ford's international strategy involving São Bernardo.

Chapter 9 discusses flexibility, quality and efficiency on the basis of the conditions at Dagenham and São Bernardo. The roles of job structures and Employee Involvement are investigated both because they appear to be the issues of main concern for management, in Dagenham and São Bernardo respectively, and because they relate to the major constraints that have emerged from the history of their industrial relations systems.

Chapter 10 concludes the thesis with the argument that national diversities condition international competitive strategies and that the power to compete does not follow from the use of the state-of-the art technology. Production processes are defined by the ensemble of equipment, flows, products, employees, and systems of work organization. Flexibility, quality and efficiency are not the results of arrangements at factory level alone, but of their interaction with national historical patterns of relations between capital and labour.

Chapter 2

THE INTERNATIONAL CAR INDUSTRY UP TO THE MID 1980s

Many changes have occurred in the production of cars since the product was 'created' by Benz in 1886 in the form of a tricycle fitted with a petrol-driven engine. Changes in product and labour markets have produced shifts in industrial strategies concerning production processes, work organization and marketing. Technical innovations have also modified the competitive conditions in the industry and generated new strategies from competing manufacturers.[1] New product designs, new techniques of production, increasing economies of scale, continuous capital concentration, and expanding markets, have characterized the motor industry since its earliest days. Moreover, technical innovations have resulted in great changes in the production process and have resulted in new patterns of the division of labour and new relations between employers and employed.

Three examples taken from the history of the car industry illustrate this interrelation:

1. The development of mass production techniques transformed labour market conditions,

2. The production of standard cheaper products has depended on the appearance of certain trends in income distribution in particular national economies at different times.

3. The diffusion of car manufacturing from Europe and the United States to Third World countries via marketing, through assembling to manufacturing, has reflected the

---

[1] For overviews of competition and technical change see: Abernathy, 1978; Altshuler et. al. 1985

demands of international competition.

The first section in this chapter provides an overview of the historical development of competition in the car industry pointing out common features across the different phases. These include:

1. A tendency towards the concentration of capital.

2. The expansion of markets driven by expanding production.

3. The expansion of production as a result of technical changes or changes in working methods or the division of labour.

4. Geographical expansion stimulated by governmental interventions, labour problems and cost advantages. The picture is very complex, as it covers a wide range of historical developments in the car industry both worldwide and over a large time span.

The second section deals with the latest phase in the history of the motor industry and stresses that changes in the pattern of competition have brought to the fore issues of global competition. While national markets have become more and more internationalized, producers have become more aware of the role of national conditions in production as the basis of competitive advantage, particularly in relation to the management of labour.[2]

---

[2] For a recent statement of this view see: Dyer et. al. 1987.

1. Earlier developments

This section discusses the roles of both market demand and labour markets in the competitive strategies followed by the main producers, during the early phases of the industry's development in Europe and in the United States.[3]

Before becoming car manufacturers, the European companies that first entered the business had been bicycle or machine-tool manufacturers. They had industrial experience, they had capital, they employed craftsmen, and they knew how to organize labour to reduce costs, knew how to maximize workers' efforts, had organized distribution systems and had acquired reputations as high-quality producers.

The policy of the first producers was to manufacture robust, expensive and well engineered vehicles. Competition amongst producers was concerned mainly with quality. Only the wealthy could buy cars. Demand was for comfort and the least possible maintenance. Some of the European producers aimed at manufacturing smaller and cheaper cars. But the really cheap model did not appear until 1908 and was then pioneered by Ford, in the United States.

The European luxury market was stagnant by 1907. Although there was not a sharp recession in the period, an economic crisis was threatening the motor industry. In Europe, this crisis was overcome through product diversification into manufactured goods that required similar production

---

[3] This account of the early development of the industry draws on: Altshuler, 1985; Bardou et al, 1982; Bhaskar, 1979 and 1980; Dyer, Salter and Webber, 1987; Freyssenet, 1979; Maxcy, 1981, Maxcy and Silberston, 1959; and Tolliday and Zeitlin, 1986.

processes such as buses, lorries, tractors and military vehicles and engines for planes and ships. This strategy enabled both the equipment and the labour force to be utilized most fully rather than being transformed. This implied taking risks on the market by exploring areas of possible future expansion. On the other hand, producers avoided the costs of changing work organization (both economically and politically) allowing for consent to be developed. Given the technical conditions of the time, the expertise of workers was of the greatest importance in launching new products. Heavy capital investment was avoided, and the potential ensuing risks to the relationship between employers and workers were averted, and the product diversification strategy proved successful.

In the United States the crisis was tackled through investment in a more extensive division of labour to make the reduction of production costs possible. The strategy required capital investment and a means to make the new work organization acceptable to labour. The successful combination of these elements enabled the production of cheaper cars. Soon American production was able to compete with European made cars.

Ford introduced the moving assembly line in 1913, with material flow organization according to the sequence of operations. This became the key element that characterized Fordism as a manufacturing practice. However, the production strategy implemented at the time was much broader. In comparison to the prevailing pattern, the new approach involved a more simplified design of a standard car model, the interchangeability of parts, the use of new materials, the simplification of components, and the

design of new special-purpose machine-tools.[4]

Competitive advantage favours producers who can achieve lower production costs, provided that distribution and marketing systems work in a fairly 'balanced' way. As soon as some manufacturers can produce a low cost car a crisis hits other manufacturers. This happens not only because the innovators have achieved cheaper production costs and can, therefore, obtain higher profits, but also because a larger market demand is opened up to them. New social strata can afford the vehicles produced and the other manufacturers are left behind in terms of both production costs and ability to satisfy market demand. Those who have achieved lower production costs can lower them further through the full utilization of economies of scale and thus achieve a virtuous circle. Within this logic, European producers were faced with the need to curb American competition and to improve their own strength in the market.

Looking at worldwide competitive conditions before this early period of American dominance, it is important to analyze why it was so difficult to achieve low cost car manufacturing in Europe. It was not because the market was small. The biggest world producers until 1907 were the French. Only after 1908 did England, Germany and Italy become effective competitors. Between 1903 and 1907 half of French production was exported. National trade barriers were almost nonexistent. Roads were more extensive in France than in the United States at the beginning of the century.[5] In Europe, as in the United States, there was a

---

[4] Lewchuk, 1987.

[5] For a discussion of the apparent European advantage in car production at the beginning of the century and the paradox of early American success, see Bardou, et al, 1982; and

middle class (tradesmen, farmers, manufacturers). There was a market for cheaper cars, and profit rates of European manufacturers were high, thereby providing sufficient capital for investment.

However, the investment policy of Ford in the United States was quite different from that of the European manufacturers. Before 1907 Ford (Henry Ford made his first car in 1893 and formed the Ford Motor Company in 1903) was using the same manufacturing procedures as European manufacturers. But, unlike the European producers, Ford's investment policy was directed towards the mechanization of production because of Ford's particular production needs. Compared with Europe, the United States had a shortage of skills and had no option but to use semi-skilled workers and more mechanization. The wealth of European industrial experience did not favour such innovation, while the more limited industrial experience in the USA led to the development of new strategies.[6]

The increased competitive power of American production affected European manufacturers. A general rearrangement of industrial production was combined with market expansion and protectionism. One European reaction to the American invasion of their markets took the form of increased exports, mainly to existing colonies. Trade barriers, in the form of high import duties, were also raised to protect domestic industries. These strategies allowed sufficient economies of scale, and bought time to change work organization and production techniques. Amalgamations took place and the better-off manufacturers profited by buying

---

Freyssenet, 1979.

[6] This point is raised by Freyssenet, 1979. See also, Nevins, 1954.

up bankrupted competitors.

Increasing American competition made the question of work organization more and more important for the Europeans. European manufacturers began going to the United States and sent their engineers to learn from Ford. However, changes in work organization very soon appeared to be much more than a technical problem. There were specific constraints on changes to the division of labour in Europe. New machines utilized by Ford in the United States were special purpose types instead of the universal ones used in European production processes. European manufacturers' almost exclusive use of universal machines was linked to the availability of skilled manpower. The new special purpose machines required a different type of workforce. Many skilled workers would be made redundant. Also, management techniques had to be revised to match the requirements of the new production processes based on the needs of the special purpose machines.[7]

At that time it was necessary to do more than simply feed these kind of machines. Operators had to set up machines, to calculate tool wear and machine tolerances, estimate quality of raw material and determine each step of the operations.[8] In face of such adjustment problems, European manufacturers introduced special purpose machines on a large scale, but did not use mass production techniques such as the decomposition of tasks and sequential operations of the sort Ford was using. This strategy was

---

[7] On European management and Fordist methods see, (for France) Van de Casteele-Schweitzer 1986; (for Italy) Bigazzi, 1986.

[8] Special purpose machine operators seem to be unskilled only when their work is compared with the tasks formerly carried out by craftsmen.

largely a result of the reaction of European workers against such innovations in the labour process.[9] Other practical limits to the full adoption of Fordism in Europe were the constraints of the market, partly through limits to market demand (which continued to centre mostly on the luxury segment), and partly because of legal protections of national markets.[10]

In the American domestic market, the initial proliferation of motor car manufacturers lasted only a short time. By 1909 three companies already controlled about 50% of the market. That was one year after the launch of the Ford's breakthrough 'model T' and the birth of General Motors (G.M.) out of the merger of various car and supplier companies. General Motors used Fordist manufacturing principles as much as possible but was unable to compete with Ford in terms of cost.

The rise of General Motors began once the main advantages of the 'model T' (durability and low price) became less important as better roads were built and as per capita income rose. Cosmetic and comfort features became more important, as did the support of dealer networks and the use of advertising. Because of its origins in an

---

[9] Freyssenet, 1979, p. 29, recounts that Renault's experience of introducing measurement by stop-watch resulted in a 5 day strike in November 1912, at the end of which some power was granted to the workers to control the change and pace of work. In February 1913 another strike arose over a new reorganization of work. This time the strike lasted 45 days, at the end of which Renault closed its workshops and dismissed the workers who were resisting the reorganization of production, re-hiring later the ones who accepted the new conditions. The company filled vacancies by recruiting from French rural areas.

[10] This argument is presented by Tolliday and Zeitlin, 1986, p. 4.

amalgamation of different previously existing companies, General Motors was able to transform the merged holdings into corporate divisions specialized in particular segments of the market. The market was segmented in terms of cost, quality and annual model changes based on styling changes. To coordinate the newly created divisions G.M. devised a centralized functionally departmentalized structure based on committees such as research, purchasing, engineering. This organizational model and the multidivisional structure which soon succeeded it, made it possible for G.M. to compete with Ford in the United States and abroad, and later its managerial system became standard for the management of big companies.[11]

Mass production techniques in Europe became widespread with the conditions provided by the 1914-18 War. National states demanded ammunition and military equipment. In order to produce them, the motor industry was given special allowances to import new machines. Some of the skilled and unionized workers were called up to the war and a new kind of workforce - mainly women and immigrants - were recruited.[12] The war led to a new phase of labour deskilling. Special purpose machines were improved. The ones used by the mid 1920s were more precise. They no longer required finishing work by craftsmen nor special assembly of delicate parts. Assembly was facilitated by the introduction of conveyors. Maintenance workshops and toolroom were separated out from direct manufacturing. Administrative jobs were further centralized and reallocated according to new organizational principles.

---

[11] Sloan, 1972; Chandler, 1962.

[12] In Britain the craft unions defended their position rather more successfully than in France or Germany and 'dilution' was more limited.

The process of amalgamation still continued leading to increasing capital concentration in the industry.

Trade barriers had forced the first deals between American capital and some European governments, even before the War. As a result, full scale American car manufacturing started to develop in Europe. After the War, the further introduction of protectionist measures in Europe, together with shipment difficulties of fully assembled vehicles, led to an increase in American investment in Europe, firstly through building up assembly plants and then by installing full scale manufacturing facilities.[13] Following the 1929 economic clash, governments around the world raised tariffs. Production in the United States fell 75% and employment fell 45% between 1929 and 1932.[14]

At the level of the international market, economies of scale were, to a certain extent, available to European manufacturers, through their colonies and through national protectionist measures. But the options open to American capital were different. They had not only to set up manufacturing plants in European countries, but also set up assembly plants in a number of new markets such as Australia, New Zealand, South Africa, India, Argentina,

---

[13] All the cases of deals before the war relate to Ford. They established an assembly plant in the United Kingdom (Manchester) in 1911, an assembly plant in France (Bordeaux) in 1913, a tractor plant in Ireland (Cork) in 1917. After the war, the number of Ford assembly plants in Europe increased spreading to Denmark (1919), Italy (1923), Sweden (1924) and Germany (1925). In 1931, Ford decided to build fully integrated plants in England (Dagenham) and Germany (Cologne). Also after the war General Motors bought local companies in England (Vauxhall in 1925) and Germany (Opel in 1929). See Maxcy 1981.

[14] Dyer et al., 1987, p. 37.

Brazil, Chile and Mexico.[15] This remained the pattern until the mid 1950s when full-scale car manufacturing started in the third world, for the first time.

Changes in market have altered competitive strategies but the production methods settled during the 1920s prevailed worldwide until the late 1960s. In the inter war years the production strategy was throughout the world based on changing car model styles. Key components were shared by several cars. Vertical integration increased through capital concentration and mergers.

However, if the product and production methods changed little, new issues arose in the relationship between management and workers. Many of the strikes during the inter-war period raised fundamental issues of democracy. Some demands went beyond the factory but others centered on it, such as unionization rights. In the United States, following the Great Depression, workers succeeded in having their representative organization, the United Auto Workers (UAW) formally recognized by the employers. Strikes were frequent in the early 1930s with real battles between union militants and the employers'security guards.[16]

Just before World War II, the European car markets stagnated and tariff barriers were increased. European production costs had remained higher than American ones,

---

[15] See Jenkins, 1984, p. 46.

[16] Major industrial disputes in the auto industry in this period included the workers insurection in Turin, 1919-1920, in which Fiat workers played a major role, and major strikes in France in the 1930s. See Freyssenet, 1979, p. 31 and articles by Schweitzer, Bigazzi and Tolliday in Tolliday and Zeitlin, 1986.

even when using the modern state-of-the-art facilities.[17]

The main competitive problem in Europe was production costs.[18] However, outside Europe competitive strategies succeeded in expanding the market. For example, in the 1950s strategies to expand the market were directed towards manufacturing in third world countries. Various conditions favoured this strategy. Firstly, the diversified European market thwarted investment in economies of scale, and high European production costs made exporting faraway unattractive. Secondly, many multinationals had established subsidiary assembly companies during the 1920s in Third world countries. In the next two decades the domestic market in these countries expanded significantly. Thirdly, during World War II, some third world countries developed domestic capital goods sectors, and after the War government measures were taken to force or attract muntinationals to base full-scale production in their territories.

Motor industry production in third world countries was basically destined for domestic markets. Production could utilize new and unorganized workers and existing (Fordist) patterns of the division of labour in the parent companies were introduced along with the manufacturing facilities.

This period from just after the Second World War until the early 1970s witnessed the generalization of mechanization

---

[17] See Altshuler et al, 1985, p.18.

[18] Maxcy and Silberston, 1959, argue that the United Kingdom had intense price-quality competition in this period, an exception to the general European pattern. Excess capacity at Ford's plant at Dagenham (U.K. resulted in high production costs compared to American plants.

and the first steps towards automation. Production in third world countries expanded, capital concentration increased, productivity trends went up, and higher wages were received by motor workers worldwide.

Employment levels increased during the boom period between 1946 and the early 1970s. The division of labour also increased with varying effects on different categories of workers. Some new categories were created, some were reduced and others disappeared. But the main change in the labour process during this time was the generalized use of special purpose machines, which allowed more precise machining. The employment of craft workers was greatly reduced. Transfer machines were introduced extensively. A new kind of job, the 'supervisor operator', was created: a new layer between the foremen and workers. Steel sheet quality improved and semi-automatic presses allowed more precise stamping. Finishing stamping jobs disappeared. Assembly could be done entirely on conveyors, aided by mechanical devices (such as welding guns and spray painting booths). Multiwelding machines were also in use for some operations. Uphostery jobs, however, as well as tool making, still needed specialized workers.

The generalization of mechanization in manufacturing operations and the introduction of automatic machines increased the number of workers in the maintenance and tooling workshops. Mechanization required skills and more knowledge from these kinds of workers. For instance, fitters had also to be assemblers or electricians. Working methods became more important because of the necessity to organize the whole mechanized labour process and to harmonize and control the different sequences of production. Design and prototype services were enlarged, requiring a larger number of technicians, engineers and

designers in order to improve vehicle quality and performance. Administrative jobs also experienced a strong process of skilling bipolarization with typists and filing clerks, on the one hand, and middle rank administrators on the other, instead of the traditional book-keeping clerks.[19]

The expansion of production was also achieved by the introduction of a third working shift after World War II. Through their trade unions workers reacted against night shifts. As soon as some producers introduced this new working system others followed suit to obtain maximum returns on their capital investment. Usually union acceptance of night shift was bargained in exchange for wage increases and new trade union powers. The expansion of production resulting from night shift work allowed companies to absorb higher labour costs more easily.

Relations between management and workers were extremely strained in the period just after the War, notably in the United States and Italy in the late 1940s.[20] However, from the early 1950s to the late 1960s several years of 'social peace' prevailed. New problems of job control and the establishment of collective bargaining followed the diffusion of mass production. Freyssenet points out that in France and Italy workers' reactions primarily took the form of absenteeism and working-to-rule. Tolliday and Zeitlin[21] describe how in Britain shop stewards in many car factories

---

[19] For changes in the labour process see, Lewchuk, 1987; Whipp and Clark, 1986; Friedman, 1977.

[20] On Italy see Freyssenet ,1979, p.33, and Contini, 1986; on the US see Dyer et al, 1987 pp. 38 to 40, and Lichtenstein, 1986.

[21] Tolliday and Zeitlin, 1986, p. 9.

achieved controls over manning, workloads and job definitions, which become the 'envy of local militants in countries like the U.S.'. Dyer et al[22] show how in the United States, the UAW leadership between 1947 and 1970 advocated easing industrial tension through high levels of wages and benefits while confining fights to national level of collective bargaining.

In Europe in the late 1960s, relations between employers and their employees changed significantly and management turned towards new forms of the division of labour. The mobilization of shopfloor workers broke up traditional trade union structures. Working hours were reduced and new institutional procedures for negotiating and controlling changes in the workplace were established.[23] Workers gained some control over the introduction of the new equipment and over personnel allocation at all levels (workshops, factories, company). Management responses included work reorganization. New jobs replaced jobs previously occupied by workers who had used their strategic positions to develop rank and file organization. Some other jobs, prone to produce conflict, were taken to new sites where workers were too weak to bargain over working conditions, such as Spain, Turkey, Poland and Brazil.

Productivity increased worldwide, and competition focused on product diversification. Productivity differentials between Europe and the United States narrowed substantially and competition was intensified. The American market was still growing but more slowly than the European market. In

---

[22] Dyer et. al., 1987, p. 40.

[23] On patterns of industrial relations in the 1950s and 1960s, see Tolliday and Zeitlin, 1986a; Katz, 1985; Turner, Clack and Roberts, 1967.

Europe diverse national makes and models resulted in considerable variety. The creation of the European Economic Community (EEC) in 1958 turned this variety into a competitive advantage once tariffs were removed, since it made possible both product variety and adequate economies of scale.[24]

The competitive pattern in Europe and the United States was also changed by the rise of third world production. Third world manufacturing sites produced almost solely for their domestic markets, with competition between multinational subsidiaries taking the form of product differentiation. Since the Second World War government policies paid a great deal of attention to increasing national self-sufficiency. But the wide range of models and frequent model changes substantially increased design and development costs. Because of the rising costs of launching new models, finding the widest possible market became increasingly important for multinational car companies in order to recoup the substantial investments involved. The lifetime of their models was prolonged by continuing production in peripheral markets after they had been superseded by new models in the developed countries.[25]

Both in Europe and in the United States mergers continued throughout the boom period from the end of the War until the early 1970s. In 1959 four companies - General Motors, Ford, Chrysler and Volkswagen - accounted for 78% of total world vehicle production. Ten years later 85% of world production was shared between eight companies: General

---

[24] This argument is made by Altshuler at al, 1985.

[25] See Jenkins, 1984, p. 49; Oliveira and Popoutchi, 1979, pp. 143 to 155; Kronish and Mericle, 1984.

Motors, Ford, Chrysler, Volkswagen, Toyota, Fiat, Nissan and Renault. Between 1959 and 1969 world production of vehicles increased 135%.[26]

From the 1950s world demand for cars had risen because of rising wages and an expanding middle class, both in Europe and North America. The rise in incomes had also stimulated product diversification. By the mid 1960s, following the creation of the EEC, American multinationals began to integrate their European operations, initially through financial integration and subsequently through organizational integration in the early 1970s.

The competitive scenario of the 1970s saw new Japanese rivals emerge to confront the American and European companies. Trade policies and production strategies have changed considerably since the early 1970s.

2. The recent challenges

During the 1970s new features emerged in the international competitive pattern in the industry, transforming the division of labour, both internationally and at factory level, and posing new problems for management and unions.

The United States and Canada have suffered the biggest fall in car production since 1965, relative to other regions of the world (see Table 2.1). In the last two decades competition became fiercer with the emergence of new competitors on the scene. The most successful have been the Japanese and the Americans have lost most. Companies in

---

[26] Source: ARGUS, quoted in Bonnafos et al, 1983, p.118.

Europe have lost some of their share but have survived relatively well. Everywhere else production has increased. American participation in all the car producing regions in the world, including Japan, is substantial, but their biggest difficulties have centered on their domestic markets in the United States and Canada.

Table 2.1.

Regional distribution of car production in the world
(thousands of units)

Regions	1965	1970	1975	1980
North America	10016.3	7490.6	7762.0	7222.3
	(51.9)	(32.0)	(31.1)	(25.2)
Western Europe	7519.4	10378.6	9325.5	10371.8
	(39.0)	(45.6)	(37.4)	(36.2)
Japan	696.2	3178.7	4568.1	7038.1
	(3.6)	(14.0)	(18.3)	(24.6)
Centrally Planned	410.3	701.4	1768.5	2117.8
	(2.1)	(3.1)	(7.1)	(7.3)
Rest of the World	639.3	1006.2	1532.6	1889.2
	(3.3)	(4.4)	(6.1)	(6.6)
Total	19281.5	22755.5	24956.7	28639.2
	(100.0)	(100.0)	(100.0)	(100.0)

Source: From Altshuler et al, 1985:19, Table 2.3.

Two broad academic analyses about the motor industry have been published recently. The Massachusetts Institute of Technology (M.I.T.) Report, was published in 1984, and the Harvard Business School (H.B.S.) Project Report was published in 1987.[27] Both analyses focus their discussion on the new patterns of international competition.

---

[27] The MIT Report is here refered as Altshuler, et al, 1985; and the HBS Project as Dyer et al, 1987.

For the MIT Report competition in the motor industry has resulted in the creation of an extraordinary diversity of markets. Competition has taken two main forms: commercial and political.

Commercial competition has involved three typical forms of action by transnational producers: 1. Actions in relation to the product, competing in styling, price, image, performance and reliability; 2. Actions concerning production systems, involving changing the hardware, location and the social organization of the production process in search of cost reduction and greater quality and flexibility; 3. Innovative actions in market placement, strengthening the range and image of the product line across both market segments and national markets.

Political competition takes place amongst governments to protect or increase national shares of world car manufacture. The Report distinguishes two types of governments: 1. Those with a large car market and a major domestic industry, like Britain; 2. Those with a potentially large market and hopes of creating a major domestic industry in the near future, including Brazil.

For the HBS Project competitive advantage for motor producers comes from two main sources. The most important is the ability to produce at lower cost than rival companies. Failing such a lower cost strategy, competitive advantage can be achieved by differentiating the product from those of rival producers. Central to their analysis is the concept of 'national enterprise systems'. They stress that many of the differences in competitive performance originate from differences in the structure and operation of national enterprise systems, which reflect choices and the historical development of each competitor nation in

terms of the relationships between management, labour and government. The authors emphasize two key dimensions to the enterprise system: relationships between management and labour, and relationships between business and government. The present pattern of competition is defined as conflict between varying national enterprise systems.

A common characteristic of the latest phase in the history of the industry, emphasized in both analyses, is that it has involved major technological change. The historical situations in which major technological changes occur are related to transformations in the pattern of competition. The MIT study provides a broad overview of international competition centered on trade. The HBS analysis is more historically oriented with greater emphasis on national boundaries and social and economic relationships within nations. The accounts complement each other in their description of the present challenges facing the motor industry.

From the late 1960s, long established competitive positions of European and North American producers were hit by higher Japanese rates of productivity. The so-called 'Japanese challenge' came simultaneously with increased oil prices and a growing demand for smaller and more economical cars. International competition in the industry intensified because the Japanese significantly reduced costs and were able to offer a cheaper car. The Japanese could do so because they have used the factors of production more efficiently, through the Kanban system and new systems of work organization.[28]

---

[28] On the Japanese structure of production and work organization see Shimokawa, 1986; Okayama, 1986; and Koshiro, 1987.

Western producers were not able to offer vehicles as cheaply as the Japanese and still realize adequate profits. When their conditions of production enabled Japanese producers to undercut the typical pattern of costs, the international motor industry was hit by a crisis.

The Japanese produced cheaper, but they did not compete only on price. The value and quality of their products was also higher and responded better to supply and demand conditions. The oil price increases, with the consequent demand for smaller and more economical cars, boosted economies of scale for the Japanese industry. The Japanese lead forced other companies to imitate Japanese conditions of production and invest in product and process innovation. Innovation in the conditions of production came to be the core of the competitive process.[29]

Within the new context of competition, the main transformations in the labour process that have occurred since the beginning of the 1970s are:

1. New manufacturing facilities have been built, automated machines have been introduced, and new raw materials have been developed. Examples include transfer machine chains, automated foundries, automatic multibroaching, welding and painting robots, robots for maintenance and machine feeding, numerically controlled machine tools for the production of small lots, and automated assembly.

2. Specialized workers' jobs have disappeared. They have been replaced by an even smaller group of 'monitors' whose funtion is to carry out a limited number of tasks specified by the machine specifications and software programmers.

---

[29] Dohse, Jurgens and Malsch, 1984.

3. Job content has changed as well as skills. On the one hand, there remain highly skilled workers such as electrical/electronic technicians. On the other hand 'monitors' run numerically controlled machines or use automatic test equipment for inspection of faulty pieces. The use of great number of unskilled workers that characterized the generalized mechanization period has shifted towards a relative increased use of more skilled labour.[30] The motor industry is no longer a reservoir for employment.

4. Computer aided design and numerically controlled machines have deskilled some groups but increased the skills of others.

5. Administrative services have been computerized. Although the proportion of white collar technicians has increased, there are changes in the occupational structure. Automatic collection of data at the workshops, organization of assembling chains by electronic devices and other similar changes have reduced the number of qualified engineers and organization technicians, who are replaced by computer programmers and other data analysts.

At the level of international production strategies companies have turned to new production locations[31], increasing centralization of decision-making, and site specialization on particular parts of the production

---

[30] About these changes in the occupational structure see Marsden et al, 1985, pp. 68-9 and table 7.

[31] For instance, South Korea and Taiwan have become important manufacturing sites for Japanese and American capital through joint ventures. Jones and Womack, 1985 and 1986.

process. Changes in employment policies have been directed towards the recruitment of new stratas of the population, new job contents, new work organization and new wage and salary structures.

What the conflicts between management and workers in this new phase of the division of labour will be like is not yet clear. Each category of the workforce poses particular problems for management. Car companies are paying close attention to labour turnover rates. They are trying to assure a certain stability of the workforce and to make workers more involved with their jobs. Quality Circles, Quality of Working Life, and Employee Involvement programmes, all represent new managerial policies aimed at achieving greater stability through commitment. This is a lesson drawn from the Japanese: quality does not mean extra cost. This sort of approach is now appearing in the new employment policies bargained with unions or implemented directly.[32]

State policies can strongly influence the speed of this process of change in the division of labour, because protectionist measures shape competition patterns and, therefore, determine developments in production strategies.

One illustration of this is the international production strategy of the motor industry in the late 1970s. The original idea of the 'world car' project was created, and soon after abandoned, by Ford and General Motors. The initial project aimed to specialize plants on the production of standardized components and thus achieve maximum economies of scale. The intention was that parts

---

[32] For a discussion of these trends see esp. Katz and Sabel, 1985; Streeck, 1985 and 1985a.

produced in scatterred plants around the world would be assembled in a few sites only. This strategy has now been changed towards another concept of standardization. Now standardization refers primarily to the provision of one standard-model, defined by the Research and Development Centre in the Central Headquarters of the multinational, and produced as a whole, or at least partially, by different regional plants which adjust the standard-model to differentiated market demand.

On one hand, the current emphasis in design and manufacturing has been on the 'commonization' of major engineering components (engines, transmissions and brakes, for example) and on their interchangeability across models. On the other hand the diversity of 'packaging' is also emphasized in order that varying mixes of components can be put together in different ways to produce distinctive models. This means that the issues of standardization and diversification are brought together, and indeed, are closely linked. This current strategy represents an amalgamation between the interests of the multinational companies and restrictions imposed by national governments and trade barriers that would render impossible the original idea of the 'world car'.[33] Trade barriers or other protectionist measure as well as incentives for investment or state regulation of capital and labour relations are means by which governments operate as partners in the development of production strategies.[34] The kind of partnership, and the kinds of concessions or demands made, very much depend on the state of the internal class struggle.

---

[33] The same point was raised by Jones and Womack, 1985.

[34] Dunn, 1987.

Both Brazil and Britain are elements of this international production strategy with its particular competitive demands. A similar production strategy encompasses both countries even though they have very heterogeneous historic, social, economic and political conditions. The application of the motor industry's production strategies in these two countries is the subject of the following chapters.

Chapter 3

COMPETITION AND MARKET PROTECTION IN BRITAIN AND BRAZIL

The object of this chapter is to understand how production strategies have varied in the different national contexts of Britain and Brazil and to identify the causes that have led to the development of diverse patterns. Special stress is given to the historical development of the Ford Motor Company and the wider motor industry in each country.

Britain is the oldest market for cars in the world. Ford established its first factory there in 1911. Since the Second World War, Ford UK has been increasingly integrated into the European market, and its Dagenham plant has become a key element in the company's international competitive strategy. But by the late 1980s competition from European producers was challenging Ford's share of the European market and intensifying the need for Dagenham to respond to pressures for increasing efficiency.

In contrast, production of cars started in Brazil only in 1958. Ford launched its first car model in the Brazilian market, from its São Bernardo factory, in 1967. In contrast to the UK, the Brazilian market has been insulated from the effects of international competition by domestic market protection. The structure of competition in Brazil is dominated by the multinationals based in the country. Historically this has resulted in technological backwardness in the Brazilian industry.

1. The car industry in Britain

Until 1907 car production was very limited. But from 1909 the British automobile industry moved ahead rapidly taking

advantage of a large domestic market, which had been first exploited by French firms. In 1909 a Ford dealer organization was established in London, and two years later, in 1911, Ford decided to set up a subsidiary company, located in Manchester where it was the first company to introduce mass production technigues into England.

Until the First World War, Ford produced only CKD (Completely Knocked Down) vehicles in the UK. Kits were shipped from the United States to England for final assembly and British made components were rarely utilized. Complete UK manufacture came only in 1915, during the First World War, when the British government started imposing high import duties. The War also strengthened British manufacturers through their production of war goods that provided them with experience of flow-line mass production techniques.

Between 1907 and 1913 the annual growth rate of production in the British motor industry averaged 17.5%. From the very beginning British exports were substantial: nearly 60% went to the empire in 1912 and 1913, especially to Australia and New Zealand.[1] After the First World War, demand immediately increased sharply. The number of British manufacturers also proliferated leading to intense competition and many amalgamations and bankruptcies. In 1922 there were 96 manufacturers, but by 1931 the number had dropped to 40.[2]

Despite increased domestic competition there were enough

---

[1] This account of the early development of the British motor industry is drawn from the following sources: Bardou et al, 1982; Bhaskar, 1979 and 1980; Maxcy and Silberston, 1959; and Maxcy, 1981.

[2] Bhaskar, 1979, p. 17.

market opportunities for foreign competitors too. In 1925 General Motors bought the British firm Vauxhall and in 1931 Ford established an integrated plant at Dagenham, near London, aiming to consolidate its position in both Britain and Europe.

After the economic crisis of the early 1930s, competition mainly took the form of variations in quality and model. There was a proliferation of makes and models and companies operated on small production volumes. Difficulties in realizing economies of scale led to a further concentration of the industry. In 1939 the number of car producing firms totalled 33, with 6 of them dominating 90% of the mass market. These six companies were Morris, Austin, Ford, Standard, Rootes and Vauxhall.[3]

The Second World War was a period of great change. The war effort expanded experience of mass production. Heavy vehicle production increased but car production almost ceased. Many factories were dedicated to manufacturing components and accessories for aero and marine engines.

Immediately after the Second World War the industry faced serious problems. Factories had to be converted back from war work to car production. There was a shortage of steel and imports of machine tools were restricted. On the other hand, demand for cars, both in the home market and abroad, increased. Competition at that time took the form of units produced rather than price or quality. The new factories established in the war helped British manufacturers to expand their production quickly.

---

[3] On inter-war competition cf. Tolliday 1986; Church and Miller, 1977; according to 'The Economist', 21 October, 1983, the number of models produced by the 10 largest companies increased from 46 in 1930 to 64 in 1934.

Ford had opened its Dagenham operations on the banks of the River Thames in Essex in 1931 to meet UK and European demands, but it was only after the War that the facilities really came into their own. The factory had been planned to be the centre of manufacture, sales and servicing for the whole of Europe and during the 1930s, Ford began to mass produce cars in Dagenham, following its policy of offering cheap cars for European markets. Production facilities were the state-of-the-art for car manufacturing plants at the time. Nevertheless, before the War the plant operated at only about 50% capacity utilization at low profits. Full capacity utilization was not achieved till after the Second World War and it was only in the late 1950s that Dagenham achieved economic viability through economies of scale made possible by sales to the European market.

During the 1950s British based production increased sharply. By the mid 1950s the country was the world's second largest producer and the world's leading exporter. In 1950, car output was 0.5 million and in 1969 it had risen to 1.8 million. In 1946, 38% of car production was exported, but by 1951 this had soared to 77%.[4]

Besides the existence of a growing world demand for cars, the drive towards exports was also a result of government policies at the time. Foreign currency was needed to finance crucial imports for the reconstruction programme after the War. The motor industry was placed in the forefront of the export drive and steel quotas were allocated to firms according to their export performance. Meanwhile, the British internal market was restricted by

---

[4] Bhaskar, 1979, p. 18; Maxcy, 1981 ,p. 220; see also Dunnett, 1980.

policies aiming to control inflation and curb imports.

Bhaskar[5] argues that the rush for production and exports after the Second World War were the source of serious problems for the domestic British (as opposed to US owned) car manufacturers. In the rush to realize short-term profits, he argues, scant attention was paid to industrial relations, and to the structure of marketing and services. Bhaskar locates here the roots of what he calls the labour force's 'increasing unwillingness to co-operate with management'. Nevertheless, the evidence on whether or not industrial relations played a fundamental role in the onset of the UK's competitive failure remains unclear.[6] (The influence of labour relations in production strategies in Britain in the 1980s is discussed in Chapters 6 and 9 of this thesis.).

Since the late 1950s there has been a major reversal in the role of the British car industry worldwide. By 1956 West Germany displaced the UK as the world's largest exporter. The low quality and unreliability of British cars was slowly making them lose competitive ground to other European manufacturers. In addition, import controls were established by many overseas countries in which Britain had had a major market share. Some of these countries, mainly ex-colonies, had begun to develop their own automobile industries in the 1950s, through the establishment of American, German, Italian, French and Japanese subsidiaries. But, if the relative position of Britain within the worldwide markets declined, its absolute levels of vehicle production continued to increase more or less steadily until the early 1970s.

---

[5] Bhaskar, 1980, p. 18.

[6] For another view, see Tolliday, 1985.

The creation of the European Economic Community in 1958 meant the abolition of trade barriers amongst European countries, though the British market did not face increased exposure until Britain joined the EEC in 1972. Japanese competition in the late 1970s added to the growing pressure of imports.

The tendency towards the concentration of British producers continued after the Second World War. In 1952 Austin and Morris formed a defensive alliance called the British Motor Corporation (BMC) partly to resist Ford's growing threat. BMC became the biggest British company, but its profitability never reached Ford's levels. In 1956, Ford realized a net profit of £45 per vehicle against BMC's £6.50 per car.[7] As Table 3.1. shows, the pattern of mergers to defend market shares continued. In 1961, Leyland bought Standard Triumph which had previously acquired Aveling Bradford and Rover. In 1966, BMC merged with Jaguar to form British Motor Holdings (BMH). In 1968 the enlarged Leyland merged with BMH to create British Leyland Motor Corporation (BLMC). In 1975 the company was nationalized as British Leyland (BL). Many internal reorganizations followed until in 1986 BL's car division was renamed Austin Rover.[8]

In 1968 the industry comprised four major companies: three

---

[7] Bhaskar, 1979, p. 18. I retain the original reference to 'vehicle' and 'car'. Value added can vary considerably in relation to different sorts of vehicles. However, the profit difference noted by Bhaskar is big enough to indicate much about Ford's better position.

[8] Throughout this thesis both names 'British Leyland' (B. L.) and 'Austin Rover' will be used, since most of the references relate to the B. L. period. The company was renamed Rover Group in July 1986.

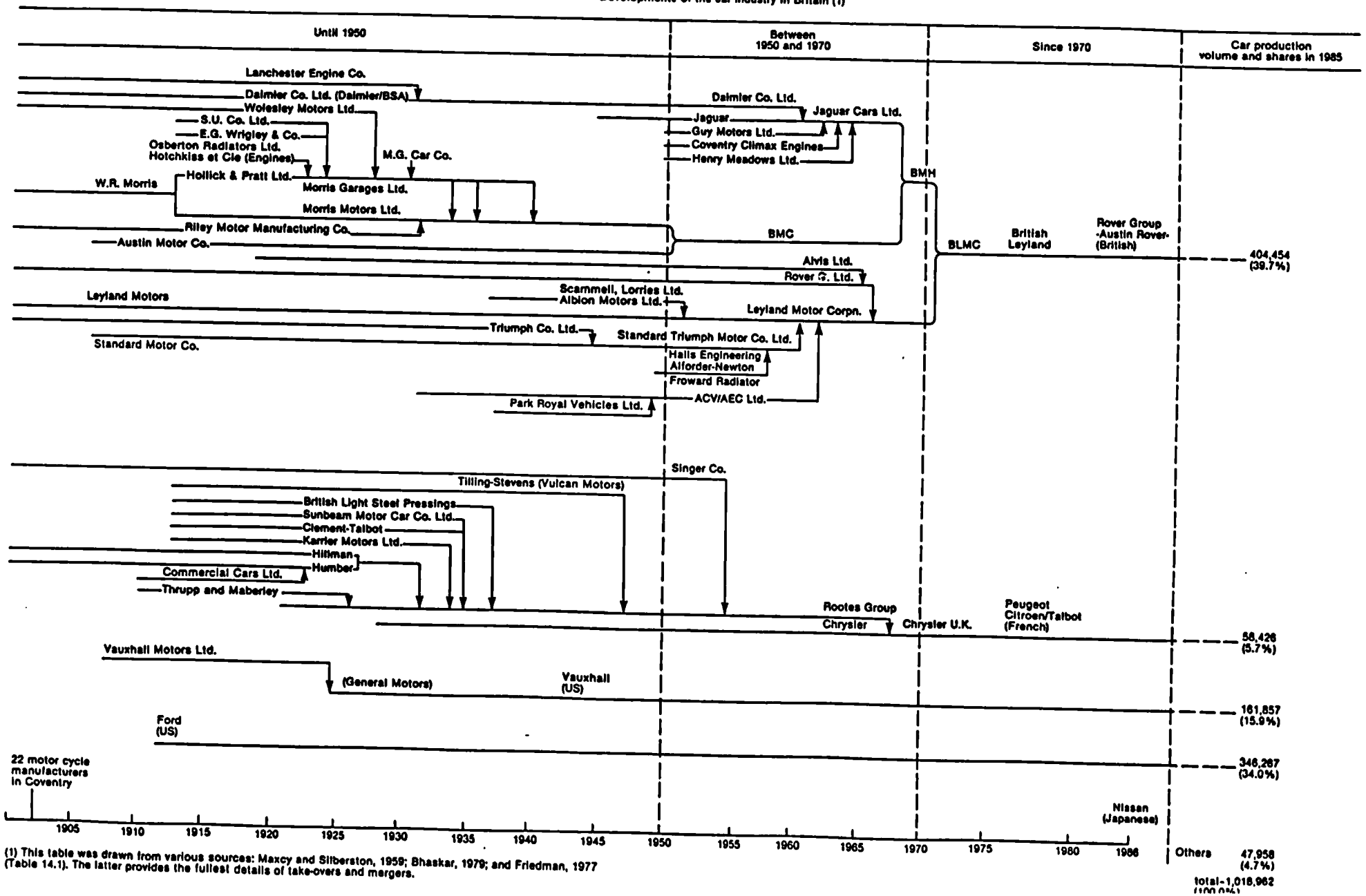
American subsidiaries (Ford, Vauxhall and Chrysler), one indigeneous producer (British Leyland), and about 10 specialist companies. Chrysler was bought by the French company Peugeot-Citroen in 1978. In addition to these four, the present structure of the British car industry (Table 3.1.) includes a new Japanese company (Nissan) which started production in mid 1986, launching its first car in February 1988.

The major producer during the 1970s and 1980s has been British Leyland (Austin Rover) followed by Ford. Since 1979, however, the companies' positions have been reversed as Ford has taken a growing share. Peugeot and Vauxhall have also consistently increased their market shares in the 1980s (Table 3.2).

In the mid 1970s the British motor industry suffered two major crises. Both Chrysler-UK and British Leyland had major financial problems. In 1975 British Leyland was rescued by the government through nationalization and a massive injection of public funds. Nevertheless, B.L. continued to face serious competitive setbacks. Chrysler was also given financial help by the British Government in 1975 and committed itself to integrate its British production with that of its European plants. These promises did not, however, prevent either Chrysler's insolvency or its sale of its British subsidiary to Peugeot in 1978.

Until the mid 1960s the major setback experienced by the British industry had been the reduction in its export markets. However, the production stagnation of the mid 1960s and early 1970s was caused by both falling foreign sales and deep transformations of the domestic market.

Table 3.1
Developments of the car industry in Britain (1)



(1) This table was drawn from various sources: Maxcy and Silberston, 1959; Bhaskar, 1979; and Friedman, 1977 (Table 14.1). The latter provides the fullest details of take-overs and mergers.

Table 3.2

Car Production by Company in Britain - 1975 to 1986

Year	Total (Z)	Ford (% share)	BL Austin-Rover (% share)	Peugeot (% share)	GM-Vauxhall (% share)	Other (% share)
1975	1,267,695 (= 100.0)	329,648 (26.0)	605,141 (47.7)	226,612 (17.9)	98,621 (7.8)	7,673 (0.6)
1976	1,333,449 (= 100.0)	383,220 (28.7)	687,875 (51.6)	144,586 (10.8)	109,118 (8.2)	8,650 (0.6)
1977	1,327,820 (= 100.0)	406,633 (30.6)	651,069 (49.0)	169,492 (12.8)	93,237 (7.0)	7,389 (0.5)
1978	1,228,949 (= 100.0)	324,407 (26.5)	611,625 (50.0)	196,481 (16.0)	84,041 (6.9)	6,395 (0.5)
1979	1,070,452 (= 100.0)	398,694 (37.2)	503,767 (47.1)	102,977 (9.6)	58,765 (5.5)	6,255 (0.6)
1980	923,744 (= 100.0)	342,767 (37.1)	395,820 (42.8)	125,314 (13.6)	55,002 (5.9)	4,841 (0.5)
1981	954,650 (= 100.0)	342,171 (35.8)	413,440 (43.3)	117,439 (12.3)	69,932 (7.3)	11,668 (1.2)
1982	887,679 (= 100.0)	306,635 (34.5)	383,074 (43.1)	56,235 (6.3)	112,669 (12.7)	29,066 (3.3)
1983	1,044,597 (= 100.0)	318,674 (30.5)	445,364 (42.6)	120,503 (11.5)	126,524 (12.1)	33,532 (3.2)
1984	908,906 (= 100.0)	273,767 (30.1)	383,324 (42.2)	95,122 (10.5)	117,114 (12.9)	39,579 (4.3)
1985	1,047,973 (= 100.0)	317,689 (30.3)	465,104 (44.4)	67,066 (6.4)	152,587 (14.6)	45,527 (4.3)
1986	1,018,962 (= 100.0)	346,267 (34.0)	404,454 (39.7)	58,426 (5.7)	161,857 (15.9)	47,958 (4.7)

Source: SMMT.

In the late 1960s trade barriers around the British market were relaxed. There was an influx of foreign goods into the UK, attracted by tariff reductions. Imports increased somewhat, but until 1972, when Britain joined the EEC, UK producers retained a virtual monopoly of the home market. Since then, however, the domestic market has become more and more exposed to foreign competition.

Import penetration of the British market has strongly affected the production strategies of the motor companies. From a position of producing substantially more than total domestic demand and exporting the surplus, the industry has moved to supplying less than the market demand and importing the shortfall. Sales of foreign produced vehicles have increased sharply. In 1982 output of cars from British plants had fallen 30 % below 1975 levels. In 1975 car exports were 42 % of UK cars output; in 1982 it had dropped to 25 % and in 1986 to 19.7%. From 1982 to 1986 some recovery of production levels raised the percentage of car output to just below 20 % of the 1975 level. (Table 3.3).

Although new car registrations of British produced cars have dropped, the individual economic performance of the companies has differed. The multinationals based in Britain have imported from their European subsidiaries, offsetting their outupt fall in Britain by production abroad. The British domestic market was 50% larger in the mid 1980s than in the mid 1970s. This growing demand was met with imports.[9]

---

[9] The top five importers of 1986 were Ford, Audi/VW, Vauxhall, Volvo and Renault. These firms accounted for 25% of all imports. Source: 'What Car?', April 1987.

Table 3.3
Car production, exports and total new registrations in Britain
1975 to 1986 (in thousands)

Year	Production	Exports	Total new registrations
1975	1,268	532	1,194
1976	1,333	565	1,286
1977	1,328	574	1,324
1978	1,223	495	1,592
1979	1,070	393	1,716
1980	924	350	1,514
1981	955	305	1,485
1982	888	226	1,555
1983	1,045	237	1,791
1984	909	192	1,749
1985	1,048	208	1,832
1986	1,019	201	1,882

Source: SMMT, and Department of Trade and Industry.

The American multinationals' subsidiaries have exported almost nothing to the United States and Canada. Moreover, although they have exported to Europe, the trend has been for these exports to decrease. On the other hand, British Leyland has generally exported more than the three foreign subsidiaries put together.[10]

The recent changes in import and export trends that have led to a reduction in output levels, have had a serious impact on employment. In 1985 the British motor industry

---

[10] Williams et al, 1987, point out that B.L.'s strenght relied greatly on its exports. When it lost export competitiveness in the late 1970s it became increasingly dependent on its home market. They argue that they lost their two principal export markets because: 1. In the United States they were challenged directly by the Japanese and lost out on price and quality; 2. In Europe they lost markets because of serious management miscalculations. In both cases the strong pound played an important role. See in particular Ch.4 'Market-Led Failure'.

(motor vehicles and parts) employed about 120,000 people, which corresponded to 65% of its level in 1979.[11] Job levels have declined rapidly, particularly in the early 1980s. The major employer in 1985 was Ford which accounted for about 40%, followed by British Leyland (Austin Rover) with 35%, Vauxhall with 10%, Peugeot with 6%, Rolls Royce with 4%, and the remaining employees distributed amongst the other small producers.

Besides the contraction in employment the hourly average earnings of motor workers also fell below those of manufacturing industry as a whole.[12]

Productivity measured by vehicles per worker indicates that there has been an increase in productivity levels, with an upward trend in the 1980s.[13]

There is a consensus in the literature that British productivity is low compared to American, Japanese and some European continental countries.[14] Since the mid 1970s there has been a widespread preocupation about production per worker in the motor industry. These concerns come not only from within the motor industry, but also from the government. Governments have endorsed management claims that the principle cause of the problems of British industry is low productivity. But, how to increase

---

[11] Employment Gazette, Historical Supplement nº 1, April 1985; and the CSO, in Rajan and Pearson, 1986, Table 7.1..

[12] Department of Employment Gazette; and TURU, 1984, Table 2.10.

[13] From Rajan and Pearson, 1986, Table 7.1. But see also Williams et al, 1987, for critical comments on these figures.

[14] Discussions about arguments on British productivity can be found in Williams et al, 1983 and 1987; Marsden et al, 1985; Willman, 1986; and Nichols, 1986.

productivity has been a controversial issue. In Chapter 5 we discuss the controversy about low productivity in relation to labour relations in the British car industry.

Major investments and restructuring of production methods have taken place in the 1980s centering on the introduction of new technology and industrial relations reforms. These issues are discussed in the remainder of this thesis, in comparison with similar trends taking place in Brazil.

2. The car industry in Brazil

The history of the motor industry in Brazil is commonly dated to the mid 1950s. This date is right as far as manufacturing of vehicles is concerned, but there is also an important pre-history of government plans for the development of the motor industry before the mid 1950s, and of local and multinational vehicle assembly in Brazil.

The history of the car industry in Brazil can be traced back to 1907 when the indigenous Indústria de Carros e Automóveis Luiz Grassi started assembly of Fiat cars. Three other foreign companies set up representation and repair offices in Brazil after the First World War: Ford in 1919, General Motors in 1925 and International Harvester in 1926. At the beginning they restricted themselves to the assembly of imported Completely Knocked Down kits - CKD, moving slowly to produce trucks and buses. In 1929 Grassi began to produce truck bodies for Ford and General Motors, and during the 1930s maintenance and repair and component production began to develop.

The world economic crisis of the 1930s changed the Brazilian pattern of development because imports of

manufactured goods became costlier and international exchange movements worsened its trade balance. The belief that growth would be generated by market forces started to lose its power. Government industrialization policies were directed towards reducing the country's dependence on the world economy. The core of the first industrialization phase, started at the time of the Second World War, was the development of capital goods industries on the basis of national capital.[15]

These policies during the War and after helped to establish a basis for vehicle production by foreign vehicle manufacturing companies. The formation of a national steel industry and the establishment of the first national vehicle producers, Fábrica Nacional de Motores (FNM) and Vemag, boosted the motor components industry.

After the Second World War, industrial capital accumulation was facilitated by plentiful, low-cost, and easily controlled labour. But the Brazilian currency (the cruzeiro) was overvalued, tariffs were low and vehicle imports climbed. The effect of the increase in imports of built-up vehicles, components and knocked down kits for assembly was to adversely affect the balance of payments. This increased the pressure on the government from national component firms and a policy of import substitution was drawn up aimed at attracting foreign motor manufacturers. The industrialization policy affected the vehicle assembly companies by making the import of parts more and more difficult. At the same time motor vehicle transport became

---

[15] On the Brazilian process of industrialization see Tavares 1972; and Oliveira, 1977.

more widespread.[16]

In order to attract foreign capital in the early 1950s the government intervened in exchange controls and established multiple-exchange rates. These damaged agro-industrial interests who were dependent on exports, and political opposition grew. In 1954 coffee prices fell in the world market and increased the discontent of the groups opposed to the government's industrial strategy. Nor did Brazilian nationalist policies in the capital goods sector and restrictions on the multinational motor industry please the United States government or entrepreneurs. They feared an extension of nationalist policies and intervened in the world coffee market triggering a further fall in coffee prices.[17] This was soon followed by the suicide of the President of Brazil, Getúlio Vargas, who was closely associated with nationalist populist policies, particularly as the creator of the code of labour laws.[18]

The credit for the development of Brazilian industry, in particular the motor industry, is often attributed to the next president, Juscelino Kubitscheck (1954-1960). His industrialization strategy was accompanied by the increasing penetration of foreign capital either through direct investment or through licences. Kubitschek's economic policies of industrialization through foreign

---

[16] A good account of the conditions for capital accumulation provided by state regulation until the late 1960s is presented by Oliveira, 1973.

[17] A more detailed account of these events can be found in Cardoso and Faletto, 1979, p. 152.

[18] Brazilian state labour legislation was instituted in 1943. It was modelled on the fascist Italian 'Carta del Lavoro'. The implications of this legal framework for labour relations are discussed in Chapter 7.

investment focused strongly on the motor industry. Multinational companies that entered the motor business were given long-term loans at low rates of interest, concessions on profit remittances, and permits to import machinery and components.

Initial government plans urged the production of trucks, jeeps and pickups.[19] The plans included policies aiming at 100% local content for vehicle production. Ford and General Motors stopped the assembly of passenger cars and confined themselves to the production of utility vehicles. Other multinationals stepped in to build plants and supply the market with both utility vehicles and passenger cars. Contrary to Ford and G.M's anticipations, the Brazilian domestic market quickly turned out to be a rapidly growing car market. The company that profited most was Volkswagen who offered adequate products to supply the demand for cars at a time when there were virtually no competitors. The VW 'Beetle' was the top seller in the Brazilian market until the late 1970s.

As a result of the economic policies followed from the mid 1950s, imports of components were considerably reduced. By 1962 the rate of local content averaged 90% (varying according to the type of vehicle produced), indicating a considerable growth of the components industry.

The motor industry was oligopolistic and depended on income concentration amongst the Brazilian population. Its

---

[19] This account of the background history of the Brazilian motor industry draws on Oliveira and Popoutchi, 1979; Guimarães, 1981; and DIEESE, 1981. Additional information comes from Maxcy, 1982, Ch 4, pp. 273-282; Bhaskar, 1980, Ch 12; Humphrey, 1982 pp. 47-50; and Kronish and Mericle, 1984, Ch. 1.

expansion was based on a continuous renewal of products directed at a market segment that was able to purchase new models periodically. Only the middle and high income strata were potential buyers.

The modernization of the economic structure of Brazil on this basis has produced rapid economic growth both in terms of the development of the motor industry and in terms of Gross Domestic Product (GDP). However, this modernization process has been accompanied by a growing presence and importance of foreign capital. The Brazilian entreprenuarial elite has linked itself closely to the interests of multinational companies. Moreover, modernization has become increasingly dependent on income disparities. The economic success of the motor industry has been dissociated from the needs of the majority of the population. This process has created a chronic deficit in the balance of payments, a growing foreign debt, and the prospects for the country managing its own development autonomously has become increasingly gloomy.

Cardoso and Faletto, two of the most prominent theoreticians of the dependency school have analyzed the development of industrialization strategies in Latin American countries, including Brazil, and have pointed out the distinctive characteristics of dependent industrialization. The crucial issue is that income concentration increases as productivity rises because productivity gains are not shared by the whole economy. Thus, the creation of sharp inequalities is typical of dependent countries, and a sine qua non condition for

these forms of development.[20]

Cardoso and Faletto (1979) analyze the interdependency between Latin American and developed economies in terms of the limits and strengths of their respective positions, and the ways they relate in world markets. They argue that 'complementarity' is required from both partners. The developed economy needs the dependent economy in order to expand its capital. The dependent economy needs to modernize and industrialize but lacks the means, which developed economies possess, to enhance development. The problem in this relationship is not the different needs of the two economies, but the unequal value in the world market of the technology and financial resources required by the dependent, and the demands that the expansion of capital, as the other side of the exchange, makes upon it. This method stresses dependency not as an imposition, but as an association of interest between capitalist groups in the developed country and those in the dependent economy that see foreign interests as a means to achieve their goal.

The development of the motor industry in Brazil is a good illustration of these views. Major shifts in the international economy, particularly those affecting mostly American financial markets had major impacts on the phases of development of Brazilian industry. The international fall in coffee prices in the first half of the 1950s was

---

[20] The dependency approach has been one of the most important frameworks for the analysis of class relations and the role and character of the state in Latin America since the late 1960s. Cardoso and Faletto have generally been recognized as two of the founders and principal theoreticians of the dependency school. See Cardoso and Faletto, (1969) 1979; and Cardoso, 1974.

followed by a boom in the Brazilian motor industry in the late 1950s followed by a period of relative stagnation from 1962 to 1967. During this latter period total vehicle production increased but this was due to a growth in passenger car sales, (following the choking off of this demand in the previous decade), at the same time that commercial vehicle production decreased. Profits also shrank in the second half of the 1960s.

Development theorists stress that the stagnation of the 1960s was a consequence of the decline of foreign trade after the Korean War boom, accompanied by a steady deterioration in the terms of international trade which was exacerbated by domestic problems.[21] This was particularly serious because exports were crucial for the pattern of economic development. Once exports began to fail, international financial aid became prominent from the early 1960s.

In Brazil the 1960s were very difficult years in economic and political terms. In 1964 there was a 'Coup d'Etat' and a succession of military governments were to stay in power until 1984. In the short-term, despite credit facilities provided by the government after the coup, consumption was restrained and the economic crisis became deeper. However from 1967-68 the car industry recovered its previous economic growth. An increasing concentration of capital took place through amalgamations, just as in Britain. (See Table 3.4.). Another aspect of the increasing concentration of the industry was a move away from the pattern of Brazilian participation in the components sector towards vertical integration under the control of the multinational assembly companies.

---

[21] See Cardoso and Faletto, 1979, p.6.

From 1968 to 1980 vehicle production rose steadily with the exception of 1977. The period from 1968 to 1974 was one of accelerated growth, based on work intensification, wage restraint and easy credit. This was the period of the famed 'economic miracle'.[22] From 1975 to 1980 growth was more moderate. Even so, 1980 was the peak production year. Total vehicle production in 1980 was almost 1.2 million. But, in 1981 production reached only two-thirds of the 1980 level. Growth was then steady until the mid 1980s and in 1985 the peak level of 1980 was almost matched.

Government credit policies in the late 1960s and early 1970s generated increased household consumer demand, and redirected the development of the motor industry towards a greater emphasis on car production through increasing market segmentation.[23] The production of diverse individual passenger cars was privileged, rather than the production of public transport vehicles such as buses, trucks and trains.

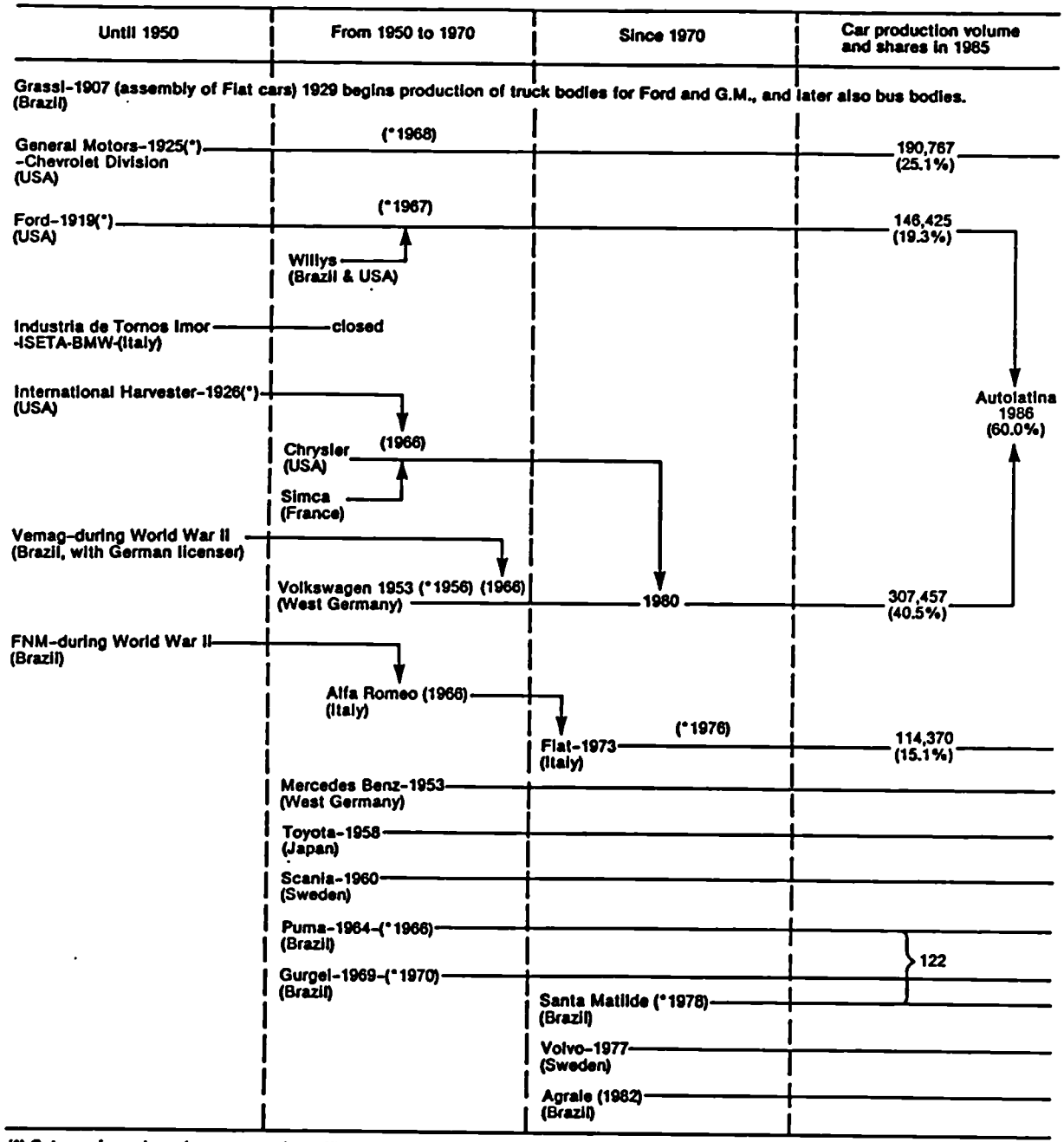
The structure of the motor industry underwent other changes in the late 1970s. Fiat entered the market in 1976, competing in the small car segment, and Volkswagen bought an almost bankrupt Chrysler. Since the mid 1970s there have been over 10 motor companies in Brazil. With the exception of 4 small Brazilian companies, they are subsidiaries of West German, Italian, American, Swedish and Japanese

---

[22] For a good account of the pattern of capital accumulation in the motor industry in Brazil in the 1970s see Humphrey, 1982.

[23] Between 1968 and 1974 Brazilian real Gross Domestic Product grew on average 11.2% per year. The domestic motor industry grew at 22%. Production of vehicles more than tripled with passenger cars growing most rapidly.

Table 3.4
Development of the car industry in Brazil (1)



(*) Set up of repair and representation offices, and soon after vehicle assembly.
(* year) Refers to the start of car production.
(1) This table was drawn based on ANFAVEA; DIEESE, 1981, Table II; Maxcy, 1982, Table 21; and Taulle, Dec 1984.

multinationals. (See Table 3.4) They are mainly located in the State of São Paulo, most of them concentrated in the ABC area.[24] The companies combine production of different kinds of vehicles. Excluding the very small domestically owned companies - Puma, Santa Matilde, Gurgel, and Agrale - four companies produced passenger cars, six produced trucks, four produced buses and five produced vans and other commercial vehicles.

As Table 3.5 shows, the 4 multinational subsidiaries producing cars in Brazil in the mid 1980s are Volkswagen, General Motors, Ford and Fiat. Volkswagen has always had the biggest market share. Before 1980 it held over half of the car market, but then lost some of it to Ford and Fiat. General Motors has continuously held second place. In the 1980s it has increased its share steadily to over 25% of the market in 1984 and 1985. Ford has traditionally been third and had a market share of around 20% in the mid 1980s. However, the company was pushed into fourth place, below Fiat, in the late 1970s and early 1980s. The launch of the Escort in 1983 strengthened Ford's position. Fiat has the lowest market share but has had steady growth since its establishment in 1976.

Brazilian government economic policies have conferred on the motor industry a central role in the overall strategy of industrialization. The power exerted by the motor industry over the Brazilian economy also derives from high foreign capital concentration. The motor industry is the industrial branch in which foreign capital is most

---

[24] ABC stands for the names of three higly industrialized cities in the Greater São Paulo region: Santo André, São Bernardo and São Caetano. Only two motor companies have plants in other States: Fiat in Minas Gerais, and Volvo in Paraná (both in the South-East of Brazil).

Table 3.5

Car Production in Brazil by Company - 1975 to 1985

Year	Total (%)	Ford (% share)	Volkswagen (% share)	General Motors (% share)	Fiat (% share)	Others (% share)
1975	712,526 (=100.0)	115,509 (16.2)	443,185 (62.2)	134,057 (18.8)		19,775 (2.8)
1976	765,291 (=100.0)	126.040 (16.5)	463,356 (60.5)	143,461 (18.7)	8,350 (1.1)	25,084 (3.3)
1977	732,360 (=100.0)	96,491 (13.2)	429,048 (58.6)	118,547 (16.2)	67,219 (9.2)	21,055 (2.9)
1978	871,170 (=100.0)	124,656 (14.3)	467,040 (53.6)	163,739 (18.8)	98,474 (11.3)	17,261 (2.0)
1979	912,018 (=100.0)	132,053 (14.5)	475,366 (52.1)	168,217 (18.4)	120,004 (13.2)	16,378 (1.8)
1980	933,152 (=100.0)	123,380 (13.2)	467,974 (50.1)	186,977 (20.0)	145,199 (15.6)	9,622 (1.0)
1981	585,834 (=100.0)	99,408 (17.0)	255,419 (43.7)	126,543 (21.7)	103,672 (17.8)	792 (0.1)
1982	672,589 (=100.0)	111,977 (16.6)	270,167 (40.2)	159,548 (23.7)	130,238 (19.4)	659 (0.1)
1983	748,371 (=100.0)	134,795 (18.0)	310,778 (41.5)	187,267 (25.0)	115,185 (15.4)	346 (-)
1984	679,386 (=100.0)	141,902 (20.9)	266,066 (39.2)	171,339 (25.2)	99,843 (14.7)	236 (-)
1985	759,141 (=100.0)	146,425 (19.3)	307,457 (40.5)	190,767 (25.1)	114,370 (15.1)	122 (-)

Source: ANFAVEA

concentrated.[25] According to Jenkins[26] one fifth of the accumulated foreign investment in Brazilian industry is concentrated in the transport equipment industry.

Since its beginning, the competitive strategy of the car firms in Brazil has been product diversification (new makes, renewal of models, new accessories), the monopoly of production technology, and economies of scale. These factors have made competition from new entrants difficult. Price competition is not usual, although this might happen in times of economic expansion.

Following a policy of product diversification, the car companies have sought to persuade existing owners to replace their vehicles. In the early 1970s, the top 20% of the Brazilian population, in terms of income distribution accounted for 80% of all cars owned in the country.[27] The companies have feared that more equitable income distribution would reduce the growth of demand and change its character. Consequently, they have always tried to exert an influence on government wage and credit policies.

The number of models offered increased most during the period of greatest economic expansion and income concentration between 1968 and 1974. For example, in 1974 Ford produced 12 passenger car models, General Motors 15 and Volkswagen 9. These three companies had 36 of the 44

---

[25] In 1980, the four biggest motor companies (in terms of their gross margins) - Volkswagen, Mercedes Benz, General Motors and Ford - had 95.5% of the sector's fixed assets and 84.2% of its gross margins . Source: Quem é quem na economia brasileira.

[26] Jenkins, 1984, p. 51.

[27] Wells , 1977, Table 1.

car models available in the market that year. During 1958 to 1975, these companies launched 24, 17 and 16 different models respectively, though some of these models were subsequently withdrawn from the market. For example, in 1975 Ford was still producing only half of the models it had introduced in the period.[28]

Oliveira and Popoutchi have described the links between product diversification and profit remittance policies of the automobile multinationals. Profits can be remitted in different ways. Until 1974, the companies favoured remittance under the label of imports of technology, because this was more advantageous than the remittance allowed for other purposes.[29] This induced assemblers to offer new models, which would enable them to claim to be introducing 'new technology'. This was done either by introducing slight product modifications locally or by paying their parent company or its other foreign subsidiaries for 'technical services' on projects that had already had their costs paid, because the original models had already been on sale in the developed countries' markets for a long time.

Product diversification can not, therefore, be explained on the grounds that the introduction of new models was exclusively the result of competition, as some writers have argued. Jenkins[30], for example, claims that new models were introduced in order to maintain the level of demand for new cars. While this is partially true in the case of Brazil

---

[28] Source: Oliveira and Popoutchi, 1979, p. 26-27, and Table 3.

[29] Oliveira and Popoutchi, 1979, table 45.

[30] Jenkins, 1984, p. 46.

and the other Latin American markets that he studied, it is not the principal feature of the Brazilian market.

Another special feature of the motor industry in Brazil is a structural excess of production capacity. From the beginning, the installed capacity of the multinationals bore little relation to prospective demand. The companies claim that this results in a lack of economies of scale and some researchers have supported this argument and view the export policies of these multinationals as a way of expanding the market.[31]

The issue of the alleged lack of scale economies came to the fore with the deceleration of growth in the domestic market and Fiat's entry in the years from 1973 to 1975. Profits were squeezed and motor vehicle producers raised their prices. The state price control agency (CIP) opposed them severely and refused to allow prices to be raised or cost increases to be passed on to consumers. Confrontations of this kind between the CIP and the car companies have occurred frequently since then. Part of the inflationary pressure came from the 1973 oil crisis and the government's responses which had been to increase the purchase price of petrol[32] and tighten consumer credit terms for car loans.

Inflation rates and foreign debt became issues of great concern in the late 1970s. Throughout the 1970s international capital was made available to Newly Industrialized Countries (NIC) to finance development plans. Brazil borrowed capital relying on its economic

---

[31] On these lines of argument see Bhaskar, 1980, p. 290; Altshuler, 1985, p. 41; Lücke, 1987

[32] Petrol price rose 242% in real terms between January 1973 and April 1977, reaching US$ 1.70 per litre. Mericle, 1984, p. 27.

growth at the time of the 'miracle'. Once world economic activity began to decline and prospects for the world economy deteriorated, the weight of oil imports in the balance of payments had to be curbed and exports had to be increased. Both requirements had an important impact on the motor industry.

Plans to substitute alcohol for petrol as the main fuel were drawn up in 1975, in the form of an ambitious agricultural and industrial programme called PROALCOOL. Much land was turned over from labour intensive food production to capital intensive sugar cane plantations. The car industry was encouraged to develop the necessary technology and to develop special research on alcohol powered engines. The enthusiasm from motor manufacturers was great because, although this required new investment, the concern about alternative fuel sources was worldwide.[33] In 1979 alcohol engines were introduced and by 1985 alcohol fueled vehicles were 96% of car sales.

Exports were also boosted after the 1973 oil shock by the support of the BEFIEX Programme. In 1972 the BEFIEX (Banco do Brasil's Commission for the Conversion of Fiscal Benefits and Special Export Programmes) was set up, aiming at increasing Brazilian exports by the concession of special allowances. For example, under the Lei do Similar, in return for meeting certain export quotas companies could import a certain quota of industrial products for use in export activities free of import duties.[34] Until the mid

---

[33] Maxcy (1982, p. 283) notes that as early as 1923 Brazilian scientists had succeded in developing an alcohol fueled engine. He argues that this project was abandoned because oil prices were lower at that time.

[34] See Oliveira and Popoutchi, 1979, p. 166; and Tauile, 1984.

1970s, over 95% of vehicle production was destined for the domestic market. Since then, the proportion of exports has grown. Vehicle exports reached 10% of production as early as 1978.

Car exports from Brazil doubled between 1979 and 1985 (See Table 3.6). Ford was the last of the big producers (VW, GM, Fiat) to step up its exports. During the 1970s Ford's car exports were almost nonexistent. In 1981 they began to export a rising proportion of production until the mid 1980s. Just after the launch of the Escort in 1983, exports reached their highest levels. In 1984 and 1985, 32% and 25% respectively of Escort models produced in Brazil were sold in the Scandinavian market[35].

Traditionally, the Scandinavian countries had been supplied with Escorts produced at Halewood with some additional vehicles from Saarlouis in West Germany. However, once the quality of the product made in Brazil became competitive, exchange rate differences favoured production at São Bernardo for export to that market. This was later interrupted by less favourable exchange rates and pressures from trade unions, particularly in Germany.

Thus, the strategy for recovery supported by the government, following the fall in production of 1973-75, favoured the production of commercial vehicles, improvements in fuel efficiency and an increase in export programmes.

The car companies commited themselves to increased exports under the BEFIEX programme. Besides increasing economies of scale, via BEFIEX the industry escaped from some of the

---

[35] Source: ANFAVEA.

tight import policies established in the late 1970s. However, imports of equipment to expand production facilities were made more expensive through higher import duties and some bans.

The first BEFIEX contracts were renewed by all the motor companies around 1980-81. In its first BEFIEX contract, from January 1973 to December 1982, Ford was to export US$ 1 billion worth of cars and electronic components. In December 1981, in the expectation of increased export levels, Ford renegotiated the contract increasing its commitment to US$ 1.8 billion. In the second BEFIEX contract, covering the period January 1983 to December 1989, export levels are set at US$ 3 billion.[36] By December 1985 actual export values had already reached US$ 1.3 billion. Increased exports have helped the motor industry to offset the decline of the internal market that accompanied the economic crisis of the early 1980s. Falling sales in 1981 intensified competition.

The 1981 economic crisis had diverse effects on different economic sector. Economic policies privileged exports and the sectors most linked to the international economy could escape from the adversities of the domestic market. This was the strategy taken by the car producers who more than doubled their proportion of exports in relation to total production in 1981 compared to 1980. Absolute levels of exports continued upwards until 1985, with the exception of 1982. (Table 3.6).

---

[36] A new clause in the second BEFIEX contract establishes flexibility of 20%, meaning that if export value reaches US$ 3,600 billion, there is no need to renegotiate incentives.

Table 3.6
Car production and exports in Brazil
1975 to 1985

Year	Production	Exports
1975	712,526	58,854
1976	765,291	62,079
1977	732,360	44,576
1978	871,170	77,388
1979	912,018	76,486
1980	933,152	115,482
1981	585,834	157,228
1982	672,589	120,305
1983	748,371	132,804
1984	679,386	151,962
1985	759,141	160,626

Source: ANFAVEA

The employment trend in the motor industry as a whole was steadily upwards until 1980. The fall in production in 1981 started a period of substantial decrease in employment until 1984 but the consolidation of economic recovery in 1985 has resulted in increased employment levels since then.[37] Although output per worker increased continuously from 1957 until 1980, productivity fell in 1981. By 1983, however, it had regained the level of 1978.

The crisis of 1981 not only intensified exports but also provided an opportunity for the restructuring of production. The car companies became more involved with the international market. The period between 1981 and 1984 was one of great investments with a strong emphasis on new models and innovation in production processes. Volkswagen introduced the Gol (Golf/Rabbit) in 1980 and the Santana in

---

[37] Employment in the motor industry in 1980 was 131 thousand, in 1984 it reached 102 thousand, the lowest level in the decade. In 1985 and 1986 employment was up to 115 and 127 thousand respectively. Source: ANFAVEA.

1984/85; General Motors produced the Monza (J car) in 1982, Ford the Escort in 1983 and Fiat the Uno in 1984. In addition old model lines were facelifted and families of models extended. The proliferation of new models together with the benefits of the export programme increased the competitiveness of Brazilian products abroad. Car exports were sustained more strongly than those of other vehicles. As Table 3.7 shows, the biggest export market for Brazilian-made cars in the 1980s has been Latin America counting both built up and CKD exports. African as well as Latin American countries have imported significant proportion of CKD cars. Europe has been the second major export market, but has been the first in terms of built up cars.

It has been argued by Araujo and Tauile that the drive to attract consumers in the Brazilian domestic market has stimulated the production of new, more sophisticated and higher quality cars, and that the need for higher quality, both for the domestic market and for exports, has made the introduction of new technology a necessity. The same has been true of more efficient systems for handling material and for organizing production.[38] As we shall see, there are reasons to doubt such a straightforward explanation.

The debate on the introduction of new technology in the automobile industry in Brazil is a special case because it is tied up with government policies to protect the new indigenous electronic components industry. It also involves conflict with interests of multinational producers, notably the car industry.

---

[38] See Araujo, 1984 and Tauile, 1984.

Table 3.7

Brazilian exports of Built Up and CKD cars by region of destination
1980 - 1985

Year	Kind	Europe		Latin America	Africa	Middle East	Asia	North America	Others	Total
		Scandinavia Alone	Total							
1980	BU	--	21,629	21,652	2,173	1,093	--	--	1,097	47,644
	CKD	--	--	47,748	19,566	--	524	--	--	67,838
	Total	--	21,629	69,400	21,739	1,093	524	--	1,097	115,482
1981	BU	--	39,856	39,155	1,730	261	--	221	5,745	89,968
	CKD	--	--	30,276	30,792	--	--	--	9,192	70,260
	Total	--	39,856	69,431	32,522	261	--	221	14,937	157,228
1982	BU	--	55,034	5,975	1,149	104	--	--	825	63,087
	CKD	--	--	44,405	12,576	--	--	--	237	57,218
	Total	--	55,034	50,380	13,725	104	--	--	1,062	120,305
1983	BU	4,537	38,667	1,284	1,766	30,179	--	--	473	73,369
	CKD	--	--	46,056	14,376	--	--	3	--	60,435
	Total	4,537	38,667	47,340	16,142	30,179	--	3	473	132,804
1984	BU	24,174	54,167	527	240	20,005	--	--	1,935	76,874
	CKD	--	--	57,556	13,560	--	--	--	3,972	75,088
	Total	24,174	54,167	58,083	13,800	20,005	--	--	5,907	151,962
1985	BU	18,370	40,190	925	294	45,150	674	--	929	88,162
	CKD	--	1,272	58,998	12,144	--	--	--	52	72,466
	Total	18,370	41,462	59,923	12,438	45,150	674	--	981	160,628

Source: ANFAVEA

In October 1984 the National Congress voted for the National Informatics Policy and in December 1984 it became law. This meant the intitutionalization of a policy of 'market reserve' for electronic products that had been developed by the Secretariat of Informatics - SEI - which had been created in 1979 within the structure of the National Security Counsel.[39] This policy for informatics represented a shift away from the usual tendency for foreign participation in the dynamic sectors of the Brazilian economy. The law states that companies producing mini and micro computers must be 100% domestically owned. Importation of any electronic equipment is subject to SEI's aproval, which is only given if the product, or an equivalent, is not available in the country. Arguments in favour of joint ventures stressed their necessity as a means to accelerate Brazilian technological development and stressed that the scarcity of investment in Brazil would be increased by the prohibition of foreign investment in such a promising sector. As a result, the Brazilian technological gap would increase and price differences between indigenous production and production abroad would increasingly favour the competitive power of the latter.[40]

---

[39] The debate in Congress showed that those in favour were domestic companies that produced automated equipment and technology, qualified engineers and the scientific community. Those against were multinational companies that produced automated equipment in Brazil (mainly IBM, Hewlett-Packard, Digital, Control Data and Data General), some national entrepreneurs (sections of FIESP - Industrial Federation of the State of São Paulo - and CNI - National Confederation of Industry) who criticized the prohibition of joint-ventures between indigenous producers and multinationals, some PDS (the ruling conservative political party) members, and the majority of government ministers and their direct counselors. Wrobel, 1984.

[40] International concern about this policy is shown by United States pressure on the Brazilian government. In September 1983 after Reagan's visit to Brazil a report was

Imports of electronic products for the motor industry have been affected by the 'Lei da Informática'. Nonetheless, it has not prevented continuing development in the industry along lines of increasing international integration.[41] In Chapters 5 and 9 we will show how certain constraints on the use of new technology have not effectively hampered continuing international integration.

The most recent big change in the structure of the motor industry occurred on November, 24, 1986 when Volkswagen AG and Ford Motor Co. reached an agreement to consolidate their operations in Brazil and Argentina. The Brazilian Government was informed about the deal only two days before it was publicly announced. The deal included sharing production facilities and exchanging components (engines and gearboxes) through the creation of a new holding company, the Autolatina Ltda.. Volkswagen holds 51% of the

---

produced by an American Working Group stressing the need for the Brazilian informatics policy to be modified as a pre-requisit of improved Brazil-USA relations. In February 1984 the American Secretary of State, George Schultz, in a visit to Brazil clearly took a position against the policy of 'market reserve'. In October 1984 Willian Brock, the Special Advisor for Foreign Trade at the White House, took the same position. After the Informatics Policy became law, foreign entrepreneurs in Brazil issued a two page document stressing the discontent and frustation of foreign investors with this policy (CNI - Encontro empresarial Brasil-Alemanha). Also the North American coordinator of USA international communications and information policies, Diana Dougan, in a visit to Brazil stressed that the law could seriously affect foreign investors in Brazil. For a more detailed discussion of the debate about the Politics of Informatics see Wrobel, 1984.

[41] Ramamurti, 1987

new company and Ford 49%.[42] The government has emphasized that it must not affect the components industry, whose ownership is mainly national.

The creation of Autolatina followed the Brazilian and Argentinian governments' Economic Cooperation Agreement which had been concludedsome months before. This agreement aims to increase trade in manufactured goods and capital equipment. The amalgamation aims at cutting costs through joint operations in order to reduce duplication of facilities and products in the Latin American industry and to improve Brazil's international competitiveness.[43] The companies intend to maintain separate marketing identities but do not yet plan to add production capacity. Proposals call for total integration, implying joint export programmes and technological development. The companies call for an end to all trade barriers in Latin America. The amalgamation intends to trade built-up vehicles between countries, for example Ford's medium sized Sierra sedan made in Argentina will be exported to Brazil and Brazil's Escort compact will be exported to Argentina. Similar trade

---

[42] The deal between VW and Ford includes all vehicles manufacturing and components. It excludes Ford's tractors and consumer electronics operations in Brazil.

[43] The sort of cooperation includes, for example, VW's interest in using a 2.3-liter, four cylinder Ford engine for its Quantum production, while Ford would use VW's 1.8-liter Santana engine for its Corcel replacement (possibly the Orion), or even for the current Escort. Plans are to produce models that can be traded both in the domestic and foreign market. Under this plan more vans will be produced by 1990. Diesel engines produced by Ford will be used in VW's trucks replacing the MWM and Perkins engines currently in use for production for the domestic market. The Cummins engines that are fitted to trucks exported to the U.S. will be replaced by Ford engines. Brazilian made trucks will be exported to Argentina.

in parts and components is also being considered.[44] The holding company will probably be extended to other Latin American countries such as Venezuela, where Ford has one plant, and Mexico, where both Ford and Volkswagen have plants.[45]

The Companies argue that amalgamation will ease some of the pressure on Brazilian manufacturers unable to meet booming demand in 1986.[46] It would also extend a lifeline to Argentine plants faced with a lack of economic models in a market too small and economically instable to warrant special attention from home offices.[47] The integration of components for the models produced by the two companies will increase their bargaining power with suppliers. Together they will buy an average of $ 2 billion components per year and they will be able to get better prices than buying separately.

The deal was also a response by the two companies to domestic competitive pressures in Brazil. General Motors has increased its share of the Brazilian market and invested heavily. There were rumours of Toyota and Honda

---

[44] The 1987 target in bilateral auto trade is $400 million, or some 20,000 cars, but it could be expanded to as much as $ 2 billion a year within five years (Automotive News, November, 24 1986). Planned investment is $ 1 billion during the next five years in retooling and updating facilities.

[45] 'FSP', 21/12/1986.

[46] Both Ford and VW have claimed that they have had losses since 1981, due to government intervention, high local content requirements and the economic climate. The basic problem in Brazil has been price controls that have existed since 1977. In 1986 VW predicted a loss of $100 million, while Ford was expected to lose as much as $ 40 million to $ 60 million. (Automotive News, 01/12/1986).

[47] Automotive News, 24/11/1986.

deals with the Brazilian government to start production. Also, there were rumours about the abolition of the Brazilian market reserve for vehicles. Any such development would intensify competition. Since the creation of Autolatina, GM has speeded up its programme for Kadet production aiming at a launch by mid 1988.

Cooperative agreements reflect the search for economies of scale increasing efficiency and profitability which, according to arguments for the creation of Autolatina would justify new investments in new technology and increase Brazilian competitive power by lowering unit costs.

3. An equal challenge for Britain and Brazil in the mid 1980s?

Both Britain and Brazil are facing an intensification of international competition and are part of a new concept of global integration in the motor industry. Although Ford and other firms developed an international production strategy during the 1970s, the competitive strategy in the two countries only converged in the 1980s, when Brazil started to produce internationally saleable vehicles.

The precondition of such a convergence has been changes in the scale of national production and shifts in technology. Studies of the motor industry have frequently argued that competition depends on adequate levels of output to achieve minimal scale economies. In relation to developing countries, it has also been argued that the models are not saleable in more demanding markets, and that they are high cost producers.
Baranson, Mericle and others have argued that the high fixed cost structure of the Brazilian industry throughout

the 1960s was due to an excessive fragmentation of the market ('small market shared by too many producers') and low rates of capacity utilization.[48]

Recently, however, this position has been changing. Between 1975 and 1985 there has been an annual average difference of about 350 thousand units per annum between Brazilian and British production. In Brazil car production 1975-1985 averaged 766 thousand units per annum shared by four companies (Volkswagen with about 40% market share, General Motors with 25%, Ford 20% and Fiat 15%) (ANFAVEA). In the United Kingdom car production averaged over one million units shared by four major companies (Austin Rover/British Leyland with over 40% share in the market, Ford with over 30%, Vauxhall over 10% and Talbot with about 10%) (SMMT). This implied a lack of scale economies in Brazil, since the number of home based producers is the same.

The potential exists, however, for this to change significantly. A recent study by ANFAVEA indicated that vehicle production in Brazil could reach 5 million units by 1995 compared with 1.2 million in 1986. Of that total, 3.5 million would be for export.[49] The more modest OECD forecasts an increase of the Brazilian market to between 2.5 and 3.1 million in the year 2000 which is the present

---

[48] This argument is presented by Mericle, 1984; and also by Bhaskar, 1980, both based on Jack BARANSON, 'Will there be an auto industry in the LDC's future?' Columbia Journal of World Business, May-June 1968.

[49] Latin America has 370 million inhabitants. In 1986 there were about 30 million vehicles in the region, which gives a proportion of 1 car per 17 people. In Brazil the proportion is 1:10, in the USA it is 1:2.(Automotive News, 01/12/1986).

size of the Japanese market.[50]

The question of economies of scale also depends on the country's export capacity. In 1980 38% of cars produced in Britain were exported, falling to 23% in 1983. By comparison, the export levels of Brazilian production were rising from 12% to 27% of total production in the period from 1980 to 1985, with over a half of these consisting of finished cars. Brazilian exports are tending to rise while British fall, although the trend remains somewhat erratic.

Moreover, the technical constraints of scale economies are also changing. Volpato[51], points out that economies of scale at high levels of output are no longer the primary basis of competitive strategies. Within current strategies, production costs can be kept down even when output is reduced because the whole cost structure has been modified through improvements in productivity and flexibility. Although many new market trends have emerged, the most important new feature in international competition is innovation in the production processes.

In this context the news that multinationals intended to export models produced in Brazil to developed countries was seen as an interesting competitive test against Japanese high quality and low cost producers.[52] As we have already noted, the MIT project and other studies were relatively pessimistic about Brazilian prospects in international

---

[50] Gazeta Mercantil, Relatório Especial, 25 April 1985; see also Schmitz and Carvalho 1987.

[51] Volpato, 1986, p. 217.

[52] See Altshuler et al - 1985, p.303 (footnote 21 to Ch.2).

competition. Embedded in their views about the difficulties that Brazilian made cars face in competing internationally is the belief that production of low cost/high quality products depends on the availability of economies of scale and specific kinds of technology that allow for competitive levels of efficiency and quality to be achieved. They argue that these technologies require particular labour arrangements such as specific skills to operate and maintain the equipment, and flexibility in the deployment of labour.[53]

These studies have pointed out that the industry lacked a competitive edge, especially in finished units. Several factors inhibited the growth of Brazil's industry and its export potential.[54] It had made no breakthrough in production systems or products and its only advantage was low wages. In addition, the amount of labour needed to manufacture a product of given specification and quality was higher than in the developed countries, particularly Japan. Moreover, the Brazilian product was years behind the more refined and sophisticated European and North American products because the Brazilian domestic market demands

---

[53] These assumptions derive from Western producers' observations of Japanese production organization for efficiency and high product quality. Management used this line of argument ('technology requires particular labour arrangements') to negotiate with governments and trade unions for changes in the production process. Such changes either concern the introduction of new technology and microelectronics, as has been the case in Brazil, or they are related to reductions in manning levels, plant closures or the elimination of demarcation lines, as has been the case in Britain. The cases of Britain and Brazil are discussed in Chapters 6, 8 and 9.

[54] On these lines of argument see Bhaskar, 1980, p.290; and Altshuler, et al, 1985, p.41.

simpler cars. The prohibition of imported vehicles in Brazil meant that unlike a European consumer, a Brazilian one could not look around to buy an imported vehicle if the ones available were not appropriate. Although this made its exports suitable for other developing countries, it inhibited product development.

Since 1983, Brazilian vehicles have begun to emerge as internationally saleable. But it is questionable how far the technological innovations introduced into the Brazilian industry since 1983 are alone responsible for the integration of its production into the world market.[55] Other elements of the production system may be equally important.

While UK production has for a long time been oriented towards sophisticated and demanding European markets, Latin America has consistently been the biggest market for Brazilian production, except in 1982 when exports to Europe were slightly higher. But Latin America has been mainly a market for Completely Knocked Down (CKD) vehicles, because multinationals based in Brazil also have assembly plants elsewhere in the continent.

In the 1980s, however, the main market for Brazilian exports of <u>finished</u> vehicles has been Europe. Since there was no major technological innovation in the Brazilian motor industry before 1983 and since even as early as 1982

---

[55] Ford is the only car company based in Brazil to increase its exports only after 1983. Since 1980 the other companies have increased their export rates, in some cases to over half of their total production levels, as at Volkswagen in 1980, 1981 and 1983, and Fiat in 1981 and 1982. There is no evidence of technological modernization in these companies before 1983. For instance, Ford was the first to introduce robots to its assembly lines.

46% of exported finished cars were destined for Europe, the argument that the high level of sophistication of the European market was a constraint upon subsidiaries in developing countries seems to need revision.[56]

It is possible that the cost structure has changed. In 1983, at the time of the Escort export 'boom' to the Scandinavian market, the marketing director of Ford-Brasil announced to the press that the car cost US$ 500 less than West German or British Escorts, which implies about 5% to 8% lower costs in manpower, raw material and components.[57]

But many other factors have to be taken into consideration in a broader analysis of the development of these competitive patterns.. Government policies, trade union actions, or exchange rate fluctuations can all constrain or provide opportunities for market expansion. Multinational corporations watch such developments closely. For instance, a strong pound seriously constrained Ford UK in the late 1970s and early 1980, and resulted in a decline in exports and excess capacity. This was not a result of market saturation. Ford sold twice as many cars in the UK in 1984 than it produced there. The number of new car registrations in the United Kingdom has increased steadily even though Ford's production levels have fallen. Similarly, in the 1970s Ford exported almost half of its total UK production,

---

[56] An analysis published as recently as 1984 described as a constraint for the worldwide integration of Brazilian production the fact that its domestic market designs diverge from the rest of the world and cannot meet competitive quality levels. See Altshuler, 1985, p.41.

[57] In the Brazilian newspaper Gazeta Mercantil, 09/03/1983, also in Diário do Grande ABC, 15/12/84.

but in the 1980s this proportion declined sharply, reaching 6.6% in 1984.[58] Similar tendencies are shown by all UK producers. Britain has become a dis-internationalized producer at the same time that it has been integrated into the European sales market.

Conversely in Brazil, progress in export markets has not been matched by domestic successes. Even if the cost structure is more favourable than in the 1960s, it has not solved economic and political difficulties in the domestic market. Throughout 1986 waiting lists of Brazilan new car buyers were about 6 months long. Dealers complained that they received only 40% of their normal deliveries because the industry reduced its production for the domestic market in favour of exports , on the grounds that they were making losses on domestic sales.[59] Certainly export strategies were favoured by government policies through the 'Special Fiscal Benefits Programme for Exports' (BEFIEX). However, given that government facilities to increase exports have existed for a long time, this can not be considered the main determinant of increased Brazilian orientation towards the world market in the 1980s. More important was the 1981 economic recession, which stimulated production restructuring and an increase in exports.

Ford's production strategy at Dagenham and São Bernardo provide a means for understanding the development of an international production strategy of this kind. How is a common strategy differentiated in particular national,

---

[58] The source for this data is 'Annual Report and Accounts 1985' - Ford-UK.

[59] In the Brazilian newspapers: Diário do Grande ABC, 28/01/86 and Folha de São Paulo, 30/01/86.

social, political and historical contexts? Ford's strategy involves the rationalization of production, technological change, product renewal, and new approaches to industrial relations and manpower management. Though both the Brazilian and British subsidiaries are involved in this strategy their particular insertion in corporate plans is very different.

Ford's aim worldwide was to produce high quality products at a cost low enough to be internationally competitive. The role of Dagenham was to be the site for the production of the Sierra, which embodied a significant product change and also a major technological renewal, particularly in the bodyshop. The São Bernardo factory was to produce the Escort, which likewise involved a new product and major plant rebuilding and technical change. On the face of it, the competitive challenge was the same but, unlike Dagenham, São Bernardo's role as an exporter to the most developed markets was new and though it has been growing still remains marginal.[60]

The examination of these issues is the main concern of the next chapters. This is done on the basis of the changes recently introduced in the production process for car manufacturing in Ford's plants at Dagenham and São Bernardo.

---

[60] Some very recent developments suggest that Brazilian sourcing of advanced markets is continuing to increase. In 1986 Volkswagen launched a programme to export 100,000 Fox from Brazil to the United States. This model derives from two of Volkswagen's models produced for the Brazilian domestic market (Parati and Voyage), which are produced only by VW's Brazilian subsidiary. The sale price of these models in Brazil in January 1987 was US$ 5,500 for the Parati and US$ 7,000 for the Voyage. The sale price of the Fox in the US market was going to be US$ 6,000. These price differences indicate Volkswagen is using the Fox to break into the US market even if it will not make big profits by doing so.

Chapter 4

FORD: STRATEGIES AND STRUCTURES IN BRITAIN AND BRAZIL

1. Shifts in global strategy

Before the mid 1970s Western manufacturers had an unchallenged position of dominance in the world market. Chapters 2 and 3 showed how a number of new developments have occurred in the world economy since the mid-1970s which have threatened the comfortable positions of Western producers. The experiences of falling profitability and increased competitive pressures have demanded big and quick changes.

In 1979-82 Ford went through a major crisis in its European and American markets, following the second oil shock. Its traditional market preserves were being lost to Japanese made cars, which were smaller, more fuel efficient and cheaper. European producers such as Volkswagen and Fiat were rationalizing more quickly than Ford. Furthermore, Ford's first attempts to introduce new models and manufacturing processes in the United States ended in failure. Losses in the United States were only offset in 1980 to 1982 by profit remittances from abroad. In these years substantial British profits were one of the few significant sources of cash-flow for Ford worldwide. In the three years 1980-2, Ford US lost US$ 3,280 million; Ford Germany lost DM 777; but Ford UK profits amounted to £ 561 million.[1]

Drastic renewal in products, production processes and methods have been implemented worldwide since 1982. The

---

[1] Hughes and Gregory, 1986.

process of rationalization has involved plant closures, plant construction, relocation, increased outsourcing, new sales policies, employment reductions, and new approaches to work organization and industrial relations.

New product strategies have evolved since the initial idea of the 'world car' in the late 1970s. The 'world car' aimed to develop a standardized car to serve global markets. The motivation of the 'world car' concept was to decrease production costs by combining maximum economies of scale with the location of more labour intensive processes in third world countries. Since then, this strategy, pursued by both Ford and General Motors, has changed because of the recognition of more differentiated market demand and because of government regulations on national content and balance of trade requirements. In addition, the multinationals more generally feared increasing vulnerability to volatile state policies.

Instead of the 'world car' they turned to the combination of standardization and flexibility in product design and manufacturing processes, which we have described earlier. On the basis of broad geographic market areas, cars are basically produced where they are sold, unless exchange rates and government incentives make it much more profitable to do otherwise.

Ford's global integration means nowadays that common interchangeable components are designed to fit a variety of car models. The same basic car model is produced in different sites worldwide. Differences in style and production requirements demanded by particular markets are dealt with as appropriate, through flexible manufacturing. Economies of scale are optimized in research and development, in major engineering sub-systems

(particularly powertrain) and in marketing, rather than simply on the basis of product volume.

As a consequence of this particular form of global integration, Ford, like other multinationals, has sought collaborative ventures with other producers particularly in research and development. The first significant deal was made with Mazda (Toyo Kogyo), at the time the third largest Japanese car producer which is part of the financially powerful Sumitomo Group. Besides gains through sharing Japanese research and development expertise, Ford has established a firm foothold in the Asia-Pacific market through its collaboration with Mazda.[2] Co-operative ventures with Far-Eastern producers currently also include one with Korea's Kia, of which Ford owns 10%, and a joint project with Nissan for the joint development of a mini-van for the US market. In 1985 and 1986 Ford made attempts to build mergers or co-operative deals with Fiat, Austin Rover and Alfa Romeo in Europe. Moreover, as described in the previous chapter, in November 1986 Ford and Volkswagen announced a joint South American operation called Autolatina, which involves merging their production facilities in Argentina and Brazil.

Increased global integration of production is accompanied by an expansion of international trade. The more car designs, product specifications and requirements are adapted to broader markets, the easier it becomes to shift production from one place to another around the world.[3] In

---

[2] CAITS, 1985; EIU, 1985.

[3] In August 1987, Ken Whipple, Chairman of Ford of Europe, announced that Ford was in the process of linking its worldwide 'centers' by a sophisticated computer-based network called Worldwide Engineering Release System (WERS). This system provides an opportunity for the corporation to increase

the early to mid 1980s Ford experienced both the advantages and the dangers of straddling exchange rates in its international trade. Both Britain and Brazil have been affected by these changes. Deals that would be profitable at one exchange rate could be loss-makers at other rates. Cases of sudden changes in exchange rates have been relatively rare but they can be very disruptive. On the other hand, they also offer the possibility of making use of different exchange rates in meeting demand to significant competitive advantage.

In relationships with suppliers policies have moved from multiple or dual sourcing towards single sourcing. Suppliers have participated more in the design and development of products and have been required to upgrade their operations to produce the quality and costs required by Ford's standards. Interactive relationships, early involvement, cost reduction and improved product quality and services from suppliers have enabled Ford to reduce stocks and inventory.

Another feature of recent trends in car production has been the reduction of employment. In Europe Ford planned to cut employment levels by 35% between 1979 and 1986 alongside a massive introduction of robots, particularly in Body and Assembly areas. As Table 4.1 shows, they were on line for this aim in 1984 and had already introduced almost a thousand robots into their European operations over a five year period.

---

parts commonality, radically improve communications and support cost-cutting, as well as to save time in the vehicle development process. (Car August 1987).

Table 4.1
Industrial Robots by application and total employment in Ford of Europe 1979-1986 (1986 projected) (in thousands)

Robots Application	Years 1979	1982	1983	1984	1986
Body & Assembly	9	471	583	760	1,013
Engine & Foundry	-	18	36	53	168
Chassis & Transm.	11	63	97	102	106
Total	20	522	716	915	1,347
Nº of employees	154	138	130	120	100

Source: Dr. U. Eckstine, Director of Manufacturing and Planning, Fordwerke, (Harbridge House, 1984).

Management has seen new technology and job cuts as the key to solving its competitive problems. These concerns have placed great stress on industrial relations reform, the intensification of work and the achievement of greater flexibility in the deployment of labour within the factory. In pursuit of these aims new industrial relations approaches have been developed worldwide.

In the United States Ford has developed a programme for worldwide application called Employee Involvement, which is a variant of the Japanese Quality Circle approach. The Employee Involvement Programme's purpose is to achieve greater participation from workers in decisions affecting the shopfloor. Because different national systems of management/worker relations require different sorts of reforms the Employee Involvement Programme has been adapted according to the distinctive features of each manufacturing site. Ford's use of EI is considered in greater detail in Chapter 9.

The unions have demanded greater job security in exchange for such broader participation from workers while Ford has argued that it is not able to sustain such a claim in face of intense competition. Management's position is that the company needs to become efficient before committing itself on job security.

In this context of change, many similar issues arising from the international strategy of the corporation were experienced in the sites of Dagenham and São Bernardo. The roots of different tactics to implement these strategies are to be found in the different position occupied by each subsidiary within the company's world plans. This is reflected in both the administrative structure and the organization of product development in the two subsidiaries.

2. The structure in Britain [4]

Ford's position in the UK market has grown much stronger since the trend of imports started to rise in 1978. Until 1977 the largest market share in Britain was held by British Leyland. Since then, Ford has taken this leading position. However, in terms of output from its UK factories, Ford has consistently been second to British Leyland (Austin Rover). Ford cars sold in the U.K. have increasingly been produced in their European plants. Since 1984 less than half of all cars sold by Ford in the British

---

[4] Information presented about Ford's structure and the manufacturing of new products in Britain are mainly based on Interviews, Lectures by Ford management at the Imperial College and London School of Economics, and published material, in particular Harbridge House, 1984; and GLC, 1986.

market have been produced in plants located in Britain. These imports have mainly been of models which are also produced in Britain. For example, 52% of Fiestas, 30% of Sierras, 53% of Orions and 32% of Escorts sold by Ford between January and July 1984 were imported from the European plants.[5]

Ford has had more aggressive sales policies than other car manufacturers in Britain. Ford has been the major importer of cars to Britain and has exported little. These policies have been favoured by Ford's European structure, which allows for flexible movement of production and sourcing of the market from varying manufacturing and sales centers.

Since the late 1960s Ford has combined expansion with a more centralized organization structure. The creation of Ford of Europe in 1967 provided means for the central coordination of 17 national manufacturing and sales companies in Europe.

Within the international structure of the Ford Motor Company (FMC), Ford-Britain reports to Ford of Europe which is one of the four operating companies which report to the Executive Vice-President of International Automotive Operations in Dearborn-USA. The President/Chairman of Ford-Britain has always been American.

Ford of Europe has become the major power center of the FMC outside the United States. It manages a full range of strategic and tactical operations, directs and controls product development, manufacturing, sales and finance throughout Europe and several export markets. Ford of Europe Central Headquarters are in Great Britain, and it

---

[5] Source: GLC, 1986.

assigns specific production programmes to the European national companies. The national companies have no direct control or influence over key strategies and policies.

In 1979 Ford of Europe sent managers to Japan to learn their 'recipes' for greater efficiency. The ensuing 'After Japan' programme established targets for basic changes to accounting, production methods and work organization on the Japanese model. Many of the changes that have been implemented since the launching of the 'After Japan' programme were already under way. It is true that Ford management learnt much from Japanese production and copied a lot from them. But it also appeared to Ford management that implementing changes named 'Japanese practices' would increase legitimization of their own policies, particularly in relation to the trade unions.

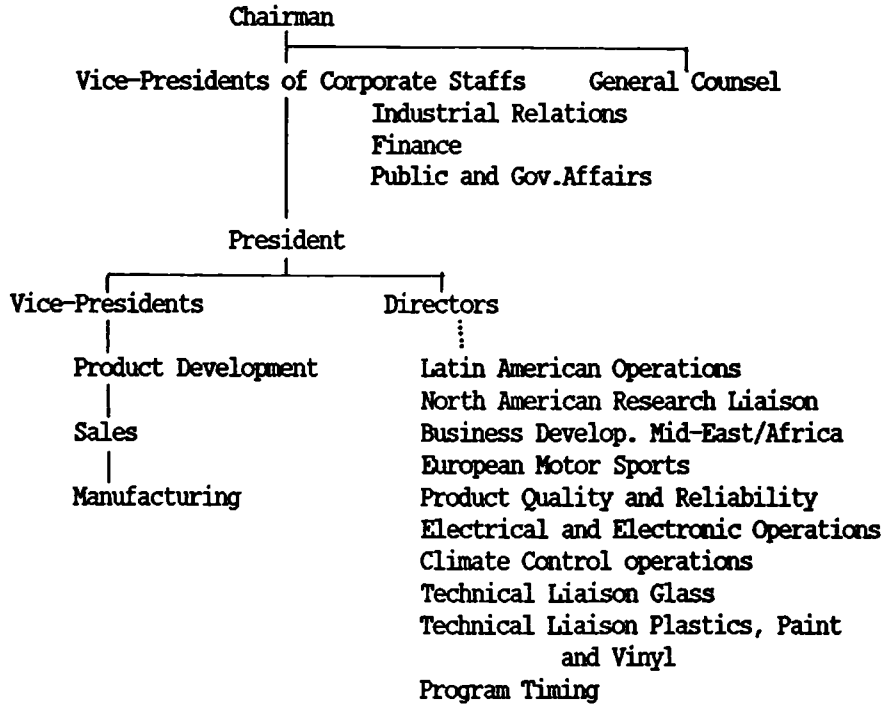
The key centre of decision-making responsibility within Ford of Europe is the Finance Area, especially since the major changes in finance followed the launching of the 'After Japan' programme. Under their overall umbrella, decision making is directed through the areas of Product Development, Manufacturing and Sales (See Table 4.2).

The criteria that drive the decision making processes in all the national European plants are laid down by the Finance area of Ford of Europe, which is in turn driven by the parent company in Dearborn-USA.

In Ford of Europe, since 1980 an extensive accounting centralization of previously self accounting plants has taken place. The central Finance area now controls market forecasting models; coordinates the computerization of engineering, production control and product design; establishes maximum pay increase levels; sets the targets

and the rate of introduction and integration for new systems and techniques across national companies; determines manning levels; and controls and monitors the company's performance in Europe.

Table 4.2
Organization structure of Ford of Europe, 1986



Source: Ford of Europe.

Profits are calculated at the level of Ford of Europe. Published accounts are prepared by each national company to fulfil the requirements of national laws but they have no meaning for Ford of Europe's internal accountancy. Ford's actual business performance in Europe is analysed on the basis of cost/profit centres, by product line, and by sales market. Revenues, costs and profits may include returns from the accounts of several different national companies. For example, published accounts of Ford-Britain include

profits made in exporting vehicles and components plus sales in the domestic market of vehicles produced in British plants. But the profits that are made by selling cars imported from Ford's European plants in the British domestic market are included in the accounts of the respective European manufacturing company, even though the dealer system which realizes these profits is based in Britain. Thus, Ford deals with Europe as an integrated profit centre. This system has mixed implications for countries where more cars are manufactured than sold, as opposed to the ones where more are sold than manufactured.

Product Development in Ford of Europe is done in two centres in Britain and Germany, where about 3000 and 2000 employees, respectively, are engaged in design, engineering, research and development. They work to specifications laid down by the Finance staff. Product development activities start in the Marketing area where research and marketing analyses for new products are carried out. These are then passed to Product Planning (one of the areas in Product and Development) and Finance, for the definition of the design, development and financial parameters within which the product has to fall. Modifications and improvements to existing lines of vehicles follow the same pattern of decision making.

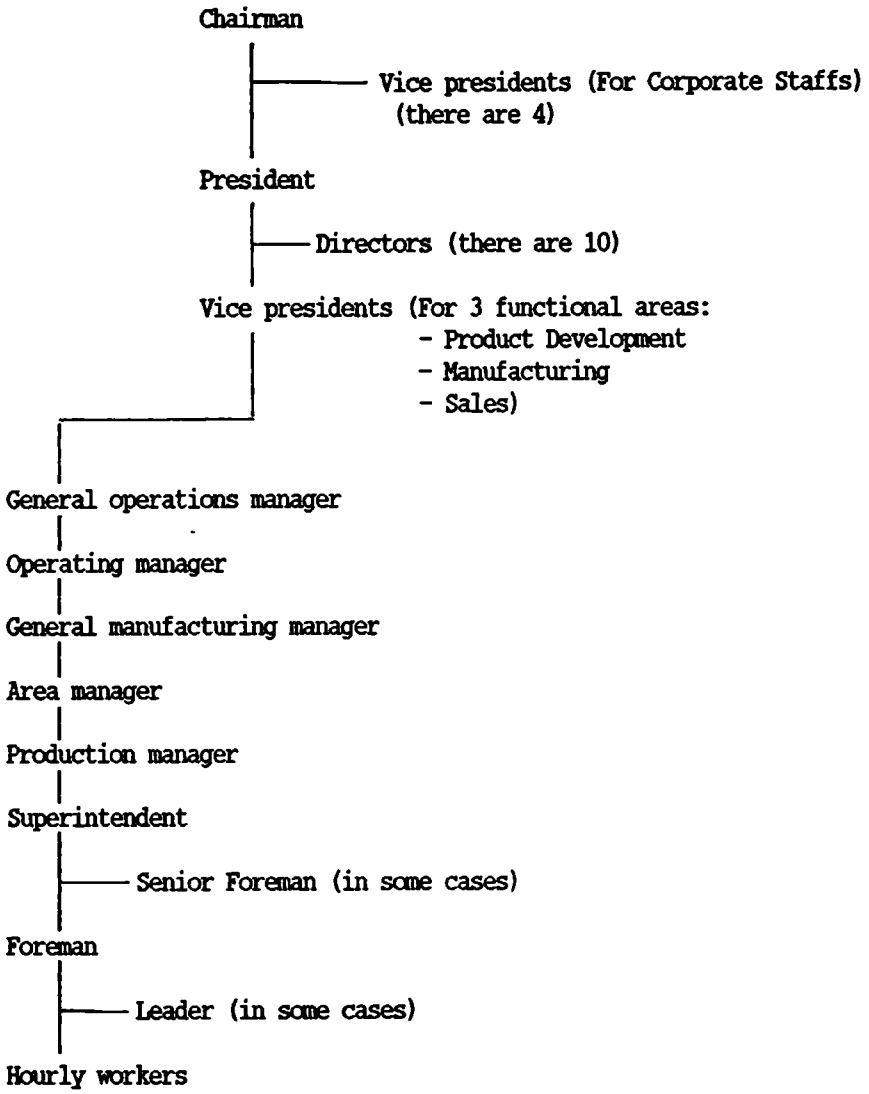
Manufacturing activities in Ford of Europe are executed on the basis of a company wide annual plan. The areas included in manufacturing are finance, manufacturing planning, plant engineering and product quality control. Ford of Europe also has control over the general policies of national companies in the Industrial Relations area. In this organization structure Ford-Britain is a national European company that, like the other 16, has its policies and targets defined by Ford of Europe.

The organizational structure in Britain follows the general pattern of Ford's national companies. The top level of the organization chart is occupied by an Administrative Council and a Board of Directors (See Table 4.3). This top level of executives shares the offices of Ford of Europe's Central Headquarters. At the different sites in Britain the major responsibility lies with the General operations manager. Particular areas of operations in a manufacturing site, such as Body and Assembly or Powertrain, are run under Operating Managers. There are 8 managerial levels at the manufacturing sites and 5 levels between workers and Operating Managers.[6]

[6] 'Operating Manager' is the equivalent to 'Area Manager' in the Ford-Brasil organization structure. See below and Table 4.4.

Table 4.3

Management Hierarchy, Ford-Britain - 1986



3. The manufacturing of new products in Britain

In 1932, following the opening of Dagenham, Ford launched its first car specifically designed for Europe (the Model Y) there. In 1936 Ford of Britain launched the first car entirely styled outside the United States. But, with these

exceptions, until the late 1960s the participation of European companies in product development was small, restricted to market research and styling. Models were designed especially for European national markets in the United States, though there was close liaison with the staffs of the subsidiaries.

Ford's performance in Britain was greatly improved after the launching of the Cortina in 1962. It soon became the best selling car in Europe. In 1968 the first Escort model was launched from the Halewood site. The Granada programme began in 1972 and was produced in Dagenham alongside the Cortina until the Fiesta was introduced, when it was moved to Germany. Technical improvements made to the Escort in 1975 made it the company's best selling car, superseding the Cortina in that position.

Ford's European subsidiaries had had little influence in product development until the Fiesta Programme was launched in the late 1960s. This became the first big job of the recently created Ford of Europe. Ford of Europe was fully committed to the project from the beginning, and the Fiesta's success in the European market strengthened both British and West German participation in Research and Development of new car models within FMC.

The Fiesta development was unusual amongst Ford's projects, since it had the double objective of entering both the Spanish market and the small car segment for the first time. To manufacture in Spain was a Dearborn decision; the decision to make a small car was a Ford of Europe recommendation which was accepted by FMC in the early 1970s. Its design parameters aimed to achieve a cost 15% to 20% below the Escort. The design studies were developed at Dearborn-USA but Ford of Europe was in charge of carrying

out market research across seven European countries. FMC central headquarters contracted the services of the Italian company Ghia for some of the Fiesta design studies. From Dearborn targets for cost, weight and number of parts were taken back to Ford of Europe, which had meanwhile decided that the car must have front wheel drive to succeed. The Project passed from Advanced Planning to Product Planning to Product Engineering and finally to Pre-programme status.

The completed prototype met the specified targets. The Fiesta was to be constructed with 3,000 parts, 1,000 less than the Escort. The Fiesta design simplification also aimed to achieve the commonization of components. The final product proposal was aproved by the finance staffs of both Ford of Europe and FMC central headquarters. After this, committees were formed to cover all manufacturing, purchasing, marketing, sales and product reliability activities and to develop schedule, budget and time targets for the launch. In 1975 improvements were made to the original Fiesta design in order to make it competitive with the new Volkswagen Polo which was launched in late 1974. Almost six years after product development studies started Fiesta construction began in the newly built factory at Valencia in Spain.[7] The Fiesta was launched in the U.K. in 1977, being manufactured at Dagenham along with the Cortina.

In 1977 FMC developed jointly with Mazda (and with the participation of Ford of Europe) a new programme to change Escort specifications notably to introduce front wheel drive and a new engine. Both the Mazda Lancer and the Ford Escort were developed in close collaboration and they look

---

[7] This account is based on Harbridge House, 1984, pp. VI-27 to VI-30.

very much alike. The development of the new Escort aimed at fully interchangeable production to cover the United States, Europe and Brazil. This model is produced in Halewood-U.K. where a major renewal of the production process took place in 1981.

In 1978 Ford announced a £ 1,000m investment programme in the U.K. and since then major production process modifications and automation have been introduced in all of its manufacturing sites in parallel with model renewal.

By the late 1970s, the development of the Sierra was becoming an urgent need for Ford of Europe because the Cortina was growing old and losing competitiveness. General Motors was about to launch a medium sized car, the 'Cavalier', that would soon threaten Ford's market share.

The Sierra's introduction in 1982, however, coincided with a period of acute financial stringency for FMC. Consequently, the Sierra had an innovative body but retained much of the conventional mechanics of the Cortina such as the engine and rear-wheel drive until 1985. At first Ford decided not to invest in re-engineering engines and transmissions, but it was later obliged to do this because of the poor sales achieved by the Sierra. The Sierra was the first new Ford product since the Fiesta.

In the development of the Fiesta Ford of Europe achieved a relative independence from Dearborn that assured it a stronger position in subsequent research and development. The Sierra was a Ford of Europe programme, though one of the key decisions about the new car was made by Dearborn. It was Dearborn that decided it was to be a rear wheel drive car because FMC was not prepared to invest the amount required to produce a front wheel drive car to replace the

Cortina. Because a traditional rear-wheel drive configuration meant that the car would be much heavier than a front-wheel drive pattern, Ford turned to improving the car aerodynamics in order to maximize fuel savings. Two problems arose from this. Ford over-emphasized the contribution that improved aerodynamics could have for reducing fuel consumption and consumers initially resisted the Sierra's unfamiliar shape. Ford decided to support the Sierra launch taking smaller profits until it introduced a revised version of the car in mid 1985. A further new version of the Sierra was launched in June 1987.

Innovations in the Sierra body resulted in major changes in Stamping and Body Construction. Advanced technology was applied to the production process. These decisions required major changes in site, equipment and work organization.[8]

4. The structure in Brazil [9]

Within the international structure of the Ford Motor Company (FMC), Ford-Brasil reports to Ford Latin America, one of the four operating companies which report to the Executive Vice President of International Automotive Operations in Dearborn-USA. In operational terms this link has meant that the president of the Brazilian subsidiary has always been an American[10] and that project costs above US$ 30.000 have to be written in English because they must

---

[8] These changes are described in detail in Chapter 5.

[9] The next two sections are primarily based on interviews with top management and technical staff in Brazil. The published Organization Directory was also valuable.

[10] In 1986 there were 14 Americans in top managerial activities in Brazil.

be approved by FMC Central Headquarters.

In 1983 Ford reorganized the structure of its Brazilian subsidaries - Ford-Brasil S/A and Philco Rádio e Televisão Ltda - by creating a holding company named Ford Indústria e Comércio Ltda - FIC. At the same time, the company moved its head offices from the manufacturing site of São Bernardo do Campo - a highly industrialized district near to São Paulo - to a modern bulding in a wealthy São Paulo neighbourhood aiming to improve the coordination of its operations.

Ford-Brasil S/A is concerned with automotive operations which are carried out in five different manufacturing sites. The site of Jaboatão employs about 1000 people, in the northeastern state of Pernambuco, and produces workers' overalls, gloves, and some upholstery components. At the Osasco site, in the Great São Paulo area, about 800 workers are employed in foundry jobs. At the Taubaté site, about 150 kilometers from São Paulo, engines are produced for both the domestic and export markets by about 3.200 employees. In São Paulo, at the Ipiranga site, trucks are produced by about 2.300 workers. The biggest site, at São Bernardo do Campo, in the Great São Paulo area, produces some powertrain, cars and tractors and employs about 12.500 people, the great majority of whom are car workers. About 70% of Ford employment in Brazil is accounted for by its automotive operations.

It has been pointed out that the main issues in the present international production strategy of the motor industry has been both the standardization of the major engineering components and the diversification of the product by 'packaging' varying mixes of components.

To achieve these aims the coordination of production activities must be structured in a way that combines freedom in creating diversity and conformity in implementing standard requirements. How far freedom and conformity are brought together very much depends on the position of the subsidiary in the company's division of labour.

The responsibility allocated to the Brazilian subsidiary by the parent company has not changed much recently. However, there have been some shifts in the content of areas and issues of control that reflect the integration of Ford-Brasil into the broader strategy.

The top levels consist of an Administrative Council and a Board of Directors. Operational Activities are placed below, either directly linked to the president or to the vice-president. Tractor Operations, Industrial Relations and Finance report to the president but Finance also reports directly to the Latin America and Asia Pacific Credit Operations. Reporting to the vice president are the areas of Product Development, Manufacturing, Supply, Sales and Marketing, as well as Productivity and Quality.

Although the three most important operational areas are product development, manufacturing and sales, the single most important area is finance because profits and costs are the leading issues in the decision making process. In the case of Ford-Britain, we noted that the centralized control exercized by Ford of Europe over the Finance area was also supervised by the FMC central headquarters in the United States. The same occurs in Brazil. The Finance area at FIC also reports directly to Dearborn. But control over the Brazilian subsidiary is tighter because expenditures above US$ 30,000 must be approved by Latin America

Automotive Operations (L.A.A.O.) offices.

The Product Development, Supply and Manufacturing areas have all been considerably modified in recent years.

The area of Product Development was created in 1985 incorporating two areas that were previously separate: 'Product and Business Planning' and 'Product Engineering'. This implied a different concept of production in which marketing and engineering are integrated from the start. On the other hand, the 'Styling' Department, which was a high priority activity until 1980, was downgraded, becoming a fourth tier area in the hierarchy of the organization. It became responsible for dealing only with minor changes to design specifications provided by the parent company and for assessing the feasibility of raw material substitutes in Brazilian conditions of production. The Alcohol Programme (PROALCOOL) developed by the Brazilian government in the late 1970s to reduce the country's dependence on imported oil has increased the importance of research and development activities in the car companies' Brazilian subsidiaries. Ford-Brasil worked jointly with the parent company to develop the necessary adaptations in the engine, carburretors and other components to make alcohol a fuel efficient substitute. By the mid 1980s over 90% of cars produced for the domestic market were alcohol fueled.

There has been a tendency to centralize strategic planning activities. Since 1983 Forward Program Control in the Supply area has been required to design components with a view towards eventual use in other regions of the world. Since the beginning of 1986 Manufacturing Strategic Planning has no longer reported to the Manufacturing Site Manager but instead reports directly to the vice president.

Since 1983 major modifications have been introduced in the management hierarchies. Until 1983 the four main manufacturing areas: Powertrain, Stamping and Body, Paint, and Final Assembly each had their own managers for Manufacturing Engineering, Manufacturing Planning, Product Control, Production Control and Quality Control. Since then, the activities of these five areas have been integrated at site level and areas of activities and managerial levels were eliminated. Decisions on Planning and Control were moved upwards under the control of the site manager, and a new concept of Area Manager, was introduced. The Area Manager is now responsible for all the manufacturing functions in his area (eg: Trim and Final Assembly) that were formerly split between five managers. However, small staffs for Manufacturing Planning and for Quality Control have been retained in each of the four main manufacturing areas.[11]

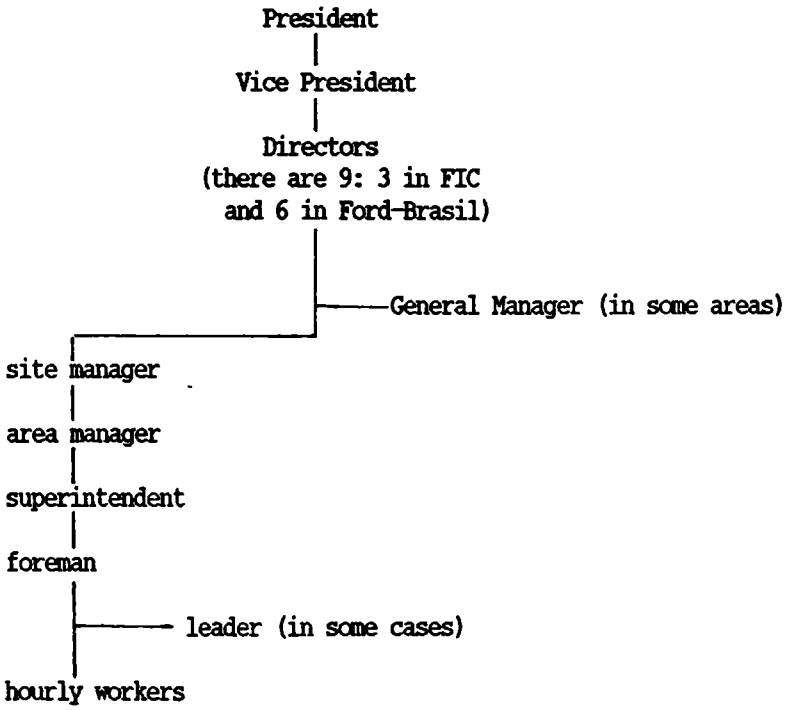
Changes in the managerial structure started in 1983 and were still in progress at the beginning of 1986. At the time of the fieldwork at São Bernardo, four senior management posts had been eliminated but their previous occupants remained in the factory with very little to do. It was some months before they were actually made redundant. Since 1985 there have been 5 managerial levels in São Bernardo, compared to the 9 that existed previously. Middle management positions have been eliminated. This has allowed a reduction in salary costs, both by reducing personnel and by cutting salary levels of the new

[11] A plan existed to introduce the same structural reforms in Ford UK in the mid 1980s. Marsden et. al (1985, p. 96) report this as actually having been implemented. However, interviews with Ford management confirm that these changes had not in fact taken place at the time of the fieldwork in 1986/7.

managers. Further reductions in staff personnel in the manufacturing area are likely because studies about changes to equipment are no longer done at the Plant level.

Table 4.4

Management Hierarchy, Ford-Brasil, 1986



As the organization chart shows the international production strategy has necessitated rationalization and centralization of decision making. Rather than implying greater participation by the Brazilian subsidiary in the development of the product, it seems that these shift in areas of responsibility indicate a different way of integrating Brazilian production into the international production strategy. Activities have been centralized at upper levels of the hierarchy and middle management levels eliminated. Previously there were 5 levels between workers and the Plant Manager. In the present structure the Area Manager is only two levels above workers. These changes in

managerial structure may possibly bear some relation to industrial relations policies related to the Employee Involvement programme. (See Chapter 9).

5. The manufacturing of new products in Brazil

Ford bought the São Bernardo manufacturing site in 1967 from Willys Overland do Brasil and since then its production of passenger cars has considerably increased. Willys produced the Gordini, Delfini and Aerowillys. Ford began by building new models on the acquired platform, starting with the Galaxie shortly followed by the Maverick. Both were manufactured with components used for the Aerowillys. At the time of the takeover Willys was jointly developing with Renault a new model for the Brazilian market. Ford, which had only produced trucks and assembled large cars in Brazil until that time, intended to launch a smaller car and after buying Willys, Ford simply made some alterations to Willys' Corcel Project, that was already 90% developed, incorporating some of its own technological changes. The launch of the Corcel in 1968 was Ford's debut in the medium range saloon car segment in Brazil.

From 1967 until 1983 further models were launched by Ford as responses to the domestic competition, especially from Volkswagen, which has had the largest share of the market. But the Corcel proved to be long lasting, and replacing it was not considered. In the early 1970s Ford launched a very popular van model, the Belina, and a luxury version of the Galaxie, the Ltd Landau. Later in the decade the Pampa van model was launched. In 1975 Ford commissioned the design of a new car from Chausson, in France. It came to be the Del Rey, a larger and more luxurious model than the Corcel. In 1977 Ford developed the Corcel II jointly with Willys in

Detroit. All of these model developments fitted new manufacturing features on to the old production platform of the first Corcel series. In order that these developments could fit existing manufacturing facilities, much of the work for research and development on these new models was done in Brazil.

Ford had been unsure of investing heavily in Brazil until it decided to fit its Brazilian subsidiaries into its international production strategy. In 1972/73 a team of American and Brazilian engineers drew up a plan for Ford's expansion in Brazil. However, FMC gave up expanding its manufacturing facilities in Brazil and the plan was put away in Dearborn's files.

In the late 1970s Ford began to plan the replacement of the Corcel, which was no longer as competitive as it used to be in the domestic market. At the same time, they planned to integrate Brazilian based production into the international market. In 1979 FMC decided to invest in a completely new site in Brazil. A team of 45 people (13 Brazilians amongst them) developed the project. Ford intended to build the new site in São José dos Campos, a neighbouring city of São Paulo. But the project proved to be more costly than was expected. Accordingly, they decided to produce the 'world car', the Escort, in São Bernardo do Campo and to rebuild the plant according to its most modern site conception.

In the domestic market the Escort would replace the Corcel and Del Rey models at the same time as being exported into international markets. An enormous rearrangement in the manufacturing site followed, involving rebuilding, the introduction of new technology and new work organization. US$ 500 million, was invested with the primary aim of improving quality and productivity.

The new São Bernardo do Campo facilities were modelled on the Saarlouis site in West Germany. The latter was built in 1974, and represented the modern standard site for Ford worldwide. This modern manufacturing site conception is designed to permit easy future expansion of the existing facilities. Each area of activity is located in a separate building. Plans developed by Ford-Brasil for Escort production aimed to mirror Saarlouis' manufacturing conditions, productivity and quality.

Ford's site in São Bernardo permitted the building of new plants and provided space for further expansion. A completely new Stamping Plant, a new Paint Plant and a new Trim and Final Assembly Plant were built. Powertrain, some traditional Stamping processes and Body Sub-assembly activities were reorganized in the original single building in which all manufacturing activities used to be carried out.

Workers were moved from the old workplace to the new one, in the new buildings, without any interruption in production. Brazilian managers are very proud of this because it was the first time that such an overnight production move had taken place in Ford's worldwide history.

The Brazilian Escort was originally intended to be exclusively 'follow sourced' i.e, simply reproduce the existing production specifications used elsewhere. Qualified Brazilian engineers were taken to other Ford plants around the world, particularly to Saarlouis in West Germany to acquire experience with the new production requirements. Manufacturing specifications were sent to Brazil, the design was studied and tooling was made. But

when the components were fitted together it proved to be impossible to assemble them as a car. The specifications could not be achieved. This history of the Escort introduction to the São Bernardo Plant, was one of the very first experiences of attempting to produce a 'world car' anywhere in the world. The accounts by managers from this period stress that this experience changed the manufacturing approach to production of the same car in different plants. Nowadays fitting, finishing and matching are handled as more integral stages of product development, and are seen as activities that must be developed in specific manufacturing conditions.[12] As a result, Product Engineering in subsidiary plants which do not have Research and Development Centers came to have a more active role in the development of a new product.

The recent development of the latest version of the Escort shows how the Brazilian subsidiary participates in the manufacture of a new product.

When production of the new Escort started in Saarlouis (West Germany) at the beginning of 1986, Ford arranged a meeting in Europe of Area Managers from all the subsidiaries that would be involved in the production of the car. After the meeting a team of 5 Brazilian managers spent 4 weeks in Saarlouis to become acquainted with the new production requirements. They studied every single manufacturing operation, station by station.

After introductory training for specialized personnel in Europe, various steps were taken to set up the new product manufacturing in the São Bernardo Plant. First, Process

---

[12] This information is based on interviews carried out with management in Ford-Brasil, January to March 1986.

Engineering and Material Handling studied the design and the stamping, painting and assembly processes in order to adapt the design requirements to the existing manufacturing facilities. At this stage the schedules for manufacturing the prototype were established and suppliers were called on to produce components, working very closely with Ford's engineering department, particularly the Powertrain area.

The next step was the manufacturing of the prototype. This comprised three stages. The first, called engineering prototype, or 'naked prototype', was produced by hand machining. This was completed in January 1986. The second stage, called prototype Phase I, puts the prototype onto an assembly line, fitted with 80% of its components partially tooled by the suppliers. Many of these components were imported from Europe. In addition to Engineering and Manufacturing, the Publicity and Marketing area was called into work on the new project at this stage. The last stage, prototype Phase II, corresponds to an advanced stage of work by suppliers. Components from suppliers were assembled and disassembled to perfect fitting and matching. At this stage 50% of the components were already finally tooled.

By about 60 days before the final steps (by mid May 1986 in the case of the new Escort), leaders, foremen and key operators from the 3 shifts, in groups of 12, had been trained off-line on all the operations on the new product.

Thus, the setting up of the new manufacturing process took about six months. The final step in the introduction of the new product, called Job I, was, in the case of the new Escort, the actual production of 120 units on the 14th of July 1986 when the '4P' strategy (Production, Process, Prove out and Program) was completed so that the cars could be sent to Final Acceptance Inspection, on the 24th July.

6. Ford-Britain and Ford-Brasil compared

This comparison shows that both historical conditions and national and international competitive considerations determined the paths followed.

Whereas Ford-Britain exerts significant influence on the development of Ford of Europe's policies, American control over Brazilian operations is much more direct, with no mediating nationally based offices with strategic responsibilities. The European national companies have no direct formal control over strategies and policies, but they do exert an informal influence on Ford of Europe; and Ford of Europe has itself had increasing participation in product development policies. Car models manufactured in Britain have been either designed or revised in Britain and West Germany by staff recruited from these national companies. Nevertheless, the exact degree of freedom, or the level of influence exercised by Ford-Britain within this structure, is difficult to determine from the evidence available.

In contrast, Ford-Brasil has little control over the models produced in Brazil; models produced in São Bernardo have been directly controlled by Dearborn. Ford-Brasil's ties with LAAO in Dearborn do not permit close participation in these decisions. Car models produced in Brazil have been developed by Ford in Dearborn with the assistance of European companies. With the exceptions of the first model produced in Brazil (the Maverick) and the most recent one (the Escort), all the other models (there are 6 different car models being produced at the moment) were designed in Dearborn for the Brazilian market.

Although managers from both Brazilian and British subsidiaries participated in the reorganization of manufacturing facilities before the launching of the major new models, Brazilian managers were taken for training in Europe, whereas the British learned at home.

The decision to produce the Escort in Brazil was part of a strategy to integrate Brazilian production into Ford's global operations. It involved major steps in enhancing Brazil's integration into global production and developing its capability to handle problems of international standardization and interchangeability and was complemented by a significant streamlining of Brazilian management structures.

Chapter 5
PRODUCTION PROCESSES AT DAGENHAM AND SAO BERNARDO

This chapter presents a detailed analysis of production processes in car manufacturing at Dagenham and São Bernardo. These issues are fundamental to the company's competitive strategy and it is a central argument of this thesis that levels of productivity and quality are dependent on, and intrinsically related to the precise form of the production process and that a detailed description at this level is essential to understanding plant efficiency.

There have been many approaches to the complex issue of the study of productivity. Studies have selected a variety of variables to compare from a wide range of possibilities. Volumes of production, sales, value added, machine utilization, costs of production, size of plants and physical product per employee are amongst those most commonly used by economists. However, production is also a social process involving social relations of both an economic and non-economic character. Such interactions are complex and the complexity increases greatly when it involves explanations for international differences in productivity. In many productivity studies the conclusions are closely related to the form, assumptions and evidence used in the research. Very general analyses cannot explain details and draw conclusions related to broad patterns of economies of scale, national institutions, forms of business organization etc. On the other hand, very detailed analyses risk missing the relationship of the specific to more general factors.

Nichols provides an extensive critique of studies of productivity in manufacturing, focusing on 'the British

worker question'. [1] He argues that the recurrent arguments linking British productivity to the poor performance of British workers (derived from too strong trade unions) is an ideological trap. He carefully examines the evidence from the most noted studies (many of which single out the motor industry),[2] and questions the empirical basis of the opinions advanced by economists in these studies.

His main criticisms are that economic performance is often reduced to worker performance without adequate analysis of the context of production. For instance, the varying quality of labour in different countries has not been properly considered in international comparisons. He argues that the most promising studies of international labour productivity are of two kinds. 1. Those that compare the operations of the same companies in different countries. 2. Those that compare the same manufacturing process in different countries. However, Nichols provides no precise formula for comparing the same manufacturing process of the same companies in different countries.

This sort of comparison is a very complex matter and the most sophisticated recent work in this area has come from the International Motor Vehicle Project based at the

---

[1] Nichols, 1986.

[2] Nichols, 1986, gives special attention to C. F. Pratten, Labour productivity differentials within international companies, Cambridge UP, 1976; S.J. Prais, Productivity and industrial structure: a statistical study of manufacturing industry in Britain, Germany and the United States, Cambridge UP, 1981; R. E. Caves, 'Productivy differences amongst industries' in Caves and Krause (ed), Britain's economic performance, The Bookings Institution, Washington, DC, 1980; and CPRS, The future of the British car industry, Central Policy Review Staff, London, 1975. See in particular Ch. 3, 4 and 5. The references to the British motor industry address basically British Leyland, not contemplating Ford's productivity.

Massachusetts Institute of Technology which has been attempting to develop a research plan to assess performance and identify superior manufacturing practices in assembly plants around the world. The first available results of this work are contained in a recent MIT M.Sc. Thesis by John Krafcik.[3] The importance of this study lies in the possibility it raises of providing answers to the dreams of many researchers (and many multinational managers) of finding a formula to compare national diversity in industrial performance. The two main findings of the study are: 1. Management policies directed towards the implementation of production patterns on the Japanese model have had a considerable effect on North American plant operating performance.[4] 2. The level of technology (measured by the Robotic Index) [5] has had remarkably little effect on operating performance.

The method used is very sophisticated because it deals with a wide range of variables and attempts to provide quantitative measures for each of them. Also, Krafcik's

---

[3] Krafcik, 1988, p.13.

[4] Krafcik defines 'production management policy' as one of two kinds: 1. 'Fragile' production systems depend on worker inputs, which is a typical Japanese production system, and which is seen to have significant productivity advantages. 2. 'Robust' Fordist Western mass production model. In each of them the roles of management and labour are different. The concepts are borrowed from Haruo Shimada and John P. MacDuffie - 'Industrial Relations and 'Humanware': Japanese Investments in Automobile Manufacturing in the United States.' International Motor Vehicle Program, MIT, Cambrige, US, 1986.

[5] The Robotic Index is based on the number of installed flexible automation pieces (with at least two axes of motion and programmable capability) in each plant. 'Hard' automation is left out. Krafcik stresses the extreme difficulty in finding a method to measure the amount of automation in assembly plants. However, his method does give an indication not only of the level of automation but also the level of flexibility in manufacturing.

study is based on plant visits to 38 final assembly plants in 13 countries, representing 15 major automobile assemblers during 1986/7.

The definition of the variables and their application to the quantification of productivity is based on a list of standard activities corrected to adjust for various 'systemic and product differences that exist across plants, companies and nations.'[6] Such adjustments include variations in relief times, weld numbers, product size, and equipment content.

The measure of quality is based on the J. D. Power New Car Quality Survey, a well-respected large scale mail survey carried out by a major consultancy firm on the owners of a sample of models sold in the United States. The aim is to determine owner perceptions of quality over the first three months of ownership.[7]

Various limitations of the methodology are described in the study. The breadth of the study and the variables taken into account are impressive.[8] The limits, however, lie in the lack of any analysis of change over time, and weaknesses in attempts to deal with diversity.

The biggest problems, and those of most relevance to the sort of comparison attempted in the following chapter,

---

[6] Krafcik, 1988, p.58.

[7] 'J. D. Power New Car Quality Survey', Westlake Village, California, U.S.

[8] In terms of scope, the main limits are that only three Newly Industrialized Countries (NICs) are considered and that, in Europe, American multinationals and European producers are not distinguished.

relate to the attempt to standardize and quantify productivity variables. For example, particular importance is attached to data on space utilization within plants. This derives from Japanese practices, where there appears to be a close correlation between economical space utilization and better performance. But while this assumption may be true for a tiny country like Japan, it is unlikely to carry the same weight in the United States, Australia, Mexico and Brazil, for instance. Similar assumptions concerning the proportion of repair space as a percentage of the assembly floor area also derive uncritically from Japanese propositions. In practice, small spaces could be excessively crowded, and such a 'standard method' of data collection could easily miss it.

In another instance, Krafcik uses product mix complexity as an indicator of manufacturing flexibility and the utilization of flexible automation. In fact, this can reflect other factors too. Certain platforms can have greater designed-in flexibility. In São Bernardo's Body Assembly, for instance, four models are produced on one traditional platform, while in another platform only one model is produced using modern technology, and in another only one model using traditional processes. None use flexible robots of the kind Krafcik uses in his Robotic index.

The study also utilizes an assumption that product size can be used as an index for manufacturing complexity based on the assumption that a larger car has more attachment points for equipment than a smaller one. This does not hold true. The VW Beatle, for instance, had many more parts than the biggest car produced by VW in Brazil in 1986. Larger does not mean more effort to assembly. Using the observations in my study it is clear that even though the Escort produced

in São Bernardo is a smaller car than the Sierra, it still requires more welding, and more effort, to assemble it.

Above all, Krafcik's study was unable to quantify the contribution of 'workforce capability' to plant level performance. His own study stresses that reliance on the worker performance is a crucial aspect of the effectiveness of the 'fragile production management policies' which score best in quality and performance in the study. Yet this crucial aspect of performance remains outside the scope of his quantification.

Nichols' comment that, 'Social scientists tend to have more troubled views',[9] seems as appropriate to bear in mind in relation to Krafcik's study as to the earlier productivity studies. The following detailed study of production processes in two factories, in two countries, owned by a single firm, enables certain conclusions to be drawn, but it also underlines the difficulty and complexity of such comparisons.

1. The Sites and the areas compared

In 1985 Ford employment in the United Kingdom amounted to 53 thousand employees at 17 different sites. By 1986 employment had dropped to 49 thousand, following a pattern of continuing decline since 1980. The two biggest sites in Britain are Dagenham and Halewood which employ 33.9% and 19.7% of the British workforce respectively. They are both car manufacturing and assembly sites.

---

[9] Nichols, 1986, p. 60.

Dagenham is Ford's largest production site in Europe in terms of employment. In 1985 19,600 people were employed there. 11,845 (60.4%) were hourly-paid workers. 1.4% of the total hourly workers were women. Fiesta and Sierra models have been produced there during the 1980s. The early history of Dagenham has been described in Chapter 3. Although still on the old site Ford managers consider it to be 'in line with the best world standards in terms of technology improvements'.[10]

Halewood has produced the Escort since the late 1960s and the new-style Escort and the Orion in the 1980s. In both sites major technological improvements have been introduced since the early 1980s which have also affected all other Ford plants in Britain.[11] At the same time, though more slowly, major changes in the structure of employment have also taken place.

In terms of productivity Ford has considered Britain an inefficient producing centre and has alleged high production costs and low productivity. The strategy to supply the British market with imports from other manufacturing centres in Europe, has resulted in overcapacity at British plants. The ratios of output per worker presented by Ford have been unfavourable to Britain in comparison with other European plants. The trade unions have questioned such comparisons, but their validity is unclear.

---

[10] This statement was made by three managers at the site.

[11] It could be argued that a comparison between Halewood, instead of Dagenham, and São Bernardo would be more appropriate because Escort cars are produced in both the former and the latter. However, a comparison of production organization involves many issues of which the car model is just one. Whenever the product characteristics are relevant, the resulting differences are carefully taken into account.

The Dagenham estate comprises 6 plants: 1) Engine Plant, 2) Wheel Plant, 3) Body Plant (stamping and body construction), 4) River Plant (trim manufacture), 5) Paint, Trim and Final Assembly Plant, and 6) Knocked Down Packaging Plant. In this research the focus is on only three of the plants: the Body Plant, the River Plant and the Paint, Trim and Final Assembly Plant.

These plants have been selected for detailed comparison because they are the ones that are directly comparable with São Bernardo. To make possible comparisons between the two, only strictly equivalent processes and the workforce involved in these processes, will be considered. The Engine and Wheel Plants at Dagenham are not comparable to the São Bernardo Powertrain Plant because they are integrated in different ways and to a different extent to supply and ancillary operations carried out at other sites. The manufacturing areas that are comparable in Dagenham and São Bernardo are Stamping, Body Assembly, Paint, and Trim and Final Assembly. Table 5.1 provides employment data for these three areas at Dagenham. Table 5.2 provides the comparable figures for São Bernardo.

The hourly workers in these three plants, enumerated in Table 5.1, in December 1985 amounted to 64% of the total workforce on the Dagenham site. These plants produce two car models: Fiesta and Sierra.

Both Dagenham and São Bernardo carry out activities other than car making. The São Bernardo estate comprises plants concerned with car and tractor manufacture and with powertrain, for both domestic sales and exports. It is the third manufacturing site for the Escort, following West Germany and England. As Table 5.2 shows, in January 1986

over 12,000 people were employed in the site. Almost half of these were hourly workers directly involved in the car manufacturing areas this study is concerned with.

Table 5.1
Direct and Indirect car workers by area - Dagenham (a)

	Body Construction		Paint	Trim and Final Assy	General Services	Total
	Stamping & Sub-Assy	Body Assy. (b)		(c)	(d)	
Direct (1)	826	749	700	2,131	-	4,406
Indirect (2)	987	492	298	497	972	3,246
Total	1,813	1,241	998	2,628	972	7,652
%	23.7	16.2	13.0	34.5	12.7	100.0
Ratio (1)/(2)	0.8	1.5	2.3	4.3	-	1.4

(a) Numbers refer to average hourly workforce actually 'working' from January to September 1986. Following Ford's classification, the category 'direct' refers to production workers, and 'indirect' to workers in support activities such as cleaning, handling material, maintenance, production and quality control.
(b) Operations defined as 'sub-assemblies' are included in Stamping.
(c) Includes Trim manufacture.
(d) Includes maintenance, production control, quality control and apprentices. Refers only to 'General Services' allocated to Body Assembly and Trim and Final Assembly areas. Leaves out 615 'general services' workers allocated to other areas not covered in this study.
Source: Ford-Britain.

Table 5.2
Direct and Indirect car workers by area - São Bernardo (a)

	Body Construction		Paint	Trim and Final Assy	Total
	Stamping (b)	Body-Assy & Sub-Assy		(c)	
Direct (1)	792	1.220	621	1.874	4,507
Indirect (2)	325	433	233	480	1,471
Total	1.117	1.653	854	2.354	5,978
%	18.7	27.7	14.3	39.4	100,0
Ratio (1)/(2)	2.4	2.8	3.7	3.9	3.1

(a) Numbers refer to average hourly workforce actually working from November 1985 to June 1986. 'Direct' and 'indirect' workers are defined as for Dagenham in Table 5.1.
(b) Operations defined as 'sub-assemblies' are included in Body-Assembly.
(c) Includes Trim manufacture.
Source: Ford-Brasil

2. Production processes for body construction

At both Dagenham and São Bernardo, Ford produces only according to market demand as transmitted by dealers who submit forms at each sale, specifying all the details of each vehicle, as required by its owner-to-be. These specifications go to the Production Program where they are inserted in the assembly programme with the target that the car should be made within 15 days. On the scheduled day, the production specifications for the requested model are sent down the line for assembly.

Car body construction involves Stamping and Body Assembly which, although related, constitute separate sets of activities usually located on different shopfloors.

In traditional processes, the assembly of cars starts when stamped parts arrive from the Press Shop and are fixed in jigs on a conveyor. This transfer mechanism transports the panels through a number of work stations where the components are spot welded together by means of manually operated welding guns.

The welding process, which is the fundamental operation in body assembly, comprises a sequence of four major assembly stages: underbody assembly, bodyside assembly, body framing and finish welding.

The welding guns take the form of a set of jaws which, when pinched onto the panels fuse the metal together by means of an electric current. The number of welds in each panel is previously determined depending on the load it has to carry and on the complexity of the panel. The welding guns are floor mounted and the jaws are operated either by a pedal or suspended from an overhead track. Each operator mans one

or two guns and the number of welds executed by each operator depends both on the line speed and on the difficulty involved in reaching the points to be welded. Big sub-assembled parts such as body sides, floorpans and bulkheads are completed on separate lines before being brought together in the main frame assembly area. Large and complex panels are welded by 'multiwelders'. In this case the component is loaded into a press-like machine with fixed welding tips and the welds are executed when the two sides of the apparatus close around the panel. In the most traditional process these machines are manually controlled.

Some of the traditional processes of body assembly are still in use at Dagenham for Fiesta production. Both Fiesta and Sierra bodies are at present assembled in a very similar way, utilizing both traditional and modern processes. Differences arise mainly from the use of different stamped parts (which only require changes to the die set tables) and from the fuller use of automated equipment on Sierra than Fiesta bodies.

In São Bernardo, only the Escort benefits from some automation for the assembly of the underbody, body side and body frame. The other 5 car models produced there are assembled by traditional processes. Finish welding at São Bernardo is a completely manual process, unlike Dagenham.

Body Construction at Dagenham, 1985/6

Press Shop at Dagenham

In the Dagenham Press shop, stamping jobs and sub-assemblies - joining some of the stampings together - for both types of car are carried out. There are 1,813

workers in this area, corresponding to 23.7% of the workers directly involved in the car manufacturing areas under consideration. This is the area in which the relative proportion of indirect workers is highest (less than one direct worker - 0.8 - per indirect). Some of the stamped parts used for assembling the models produced in Dagenham are imported from the company's Spanish subsidiary.

The jobs in this area consist of pressing metal sheets by means of small and large presses and sub-assembling some of the stamped parts. These stampings are sent to the Body Shop by an electronically controlled track.

Body Assembly at Dagenham

Body assembly at Dagenham involves 1,241 workers. This corresponds to 16,2% of the hourly workforce employed for car manufacturing in the site. There are 1.5 direct workers per indirect worker.

During the first five years of Fiesta production in Dagenham, from 1977 to 1982, the body assembly process was basically done in the traditional way.

But in late 1981 and first months of 1982 major technological process innovations were installed at Dagenham for body construction for the launch of Sierra. These innovations combined new manufacturing equipment and new designs. A special feature of the new design was the use of fewer and larger panels that made possible the use of one-piece body side pressings and the installation of a new automated line of six presses to handle it in the Press Shop. The introduction of this equipment resulted in major labour savings compared to the requirements of the previous model, the Cortina.

Around April 1982 the body-shop had its layout changed and the robots were tested by first sending Cortina bodies down the line. After this, the changeover was completed and production of the new model - the Sierra - began. The Sierra was launched in October 1982. At the same time production processes for assembling Fiesta bodies were also changed combining the use of both old and new equipment.

A special characteristic of the new manufacturing system was a change in the welding process by extensive use of robots. 120 robots were installed for Sierra body construction. In 1981 investment in the Body Plant cost £ 200 million.[12] Four different kinds of robots were installed for different production requirements. Type N is used for applications where a gantry robot is more suitable. Type K is used for ordinary spot welding. Type C is used for more difficult welding points, particularly those that are hard to reach. Type A is used for lighter duties involving the application of sealers, as well as stud and arc welding, and materials handling.

The robots were first installed in the finish welding area (respot line). Robot installation was done gradually. The last process to be automated was the body framing area, in January 1983.

The body assembly process presently in use at Dagenham for the Sierra has four stages.[13] Details of the distribution of spotwelds at different assembly stages are given below

---

[12] Source: The Industrial Robot December 1982.

[13] Descriptions are based on fieldwork observations, on interviews with workers and management and on an article in The Industrial Robot December 1982.

in Table 5.4.

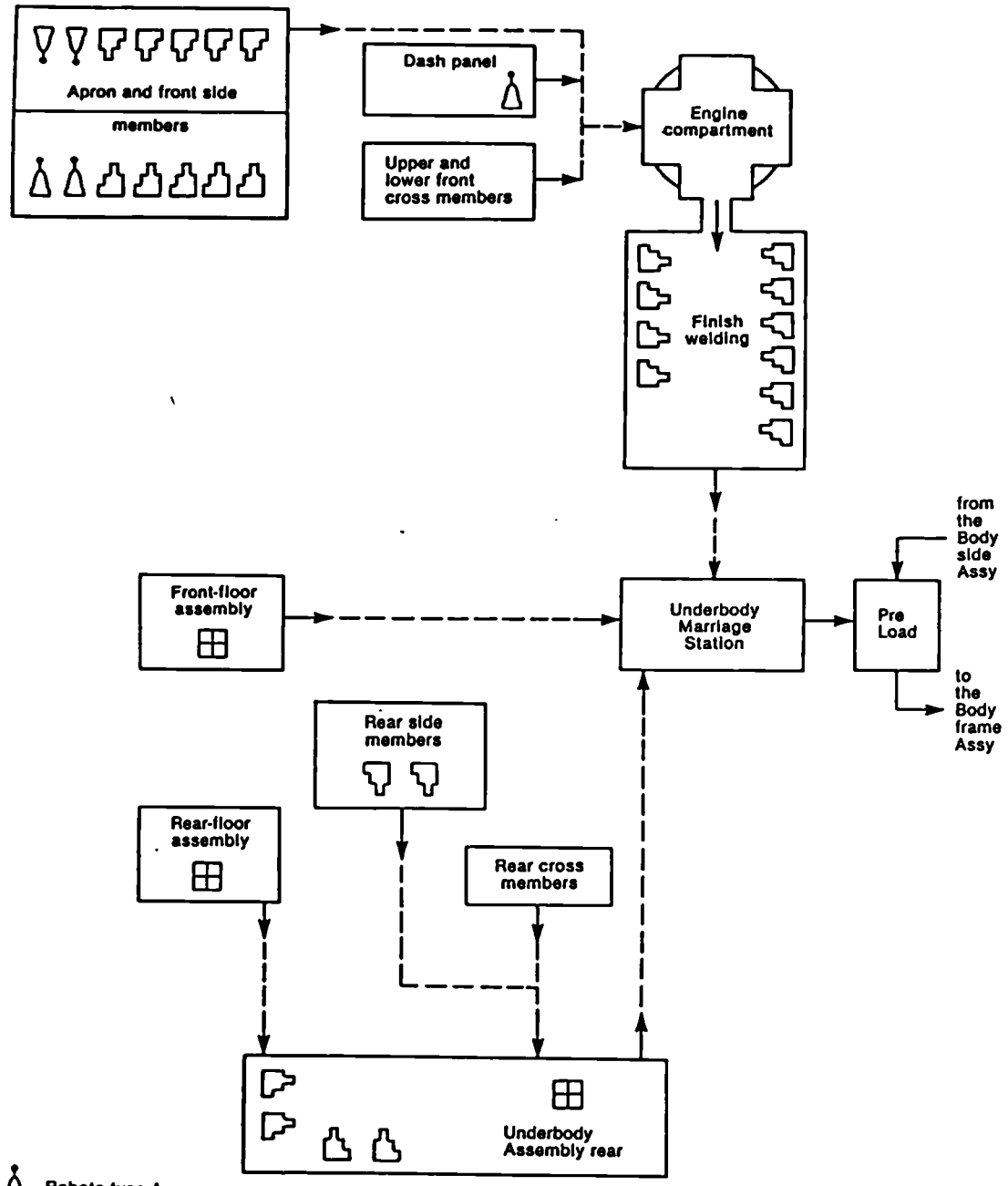
The underbody assembly area (Diagram 1) features a total of 31 robots and 5 major four-post multiweld presses. The sub-assemblies for the complete underbody are the engine compartment, the front floor and the rear underbody assembly. The assembly processes in these three sub-assemblies go on simultaneously.

The engine compartment has the largest concentration of robots. It comprises apron and front side-member, dash panel and upper and lower cross-members. In the apron and front side-member area 4 robots (type A) undertake the preliminary welding while 10 other robots (type K) apply spotwelds to complete the operation. This sub-assembly is then transferred by overhead conveyor to the engine compartment complex. Together with the upper and lower front cross-members and the dash panel (which has been studwelded by 1 robot (type A)), the apron and front side-member are loaded manually into a fixture and transferred automatically onto a four stage turntable for track welding. A shuttle beam conveyor system transfers the engine compartments in pairs through a total of 10 robots (type K) for finish welding. The completed assembly is then conveyed to the underbody marriage station.

The front-floor assembly is welded at a four-post multiweld press and is automatically transferred to the marriage station.

The rear underbody assembly comprises sidemembers, cross-members and rear floor. The rear floor is assembled and welded in a similar way to the front-floor and is automatically transferred to the underbody assembly area. The rear side members are welded by a static multiweld

Diagram 1
Underbody assembly, Dagenham 1985.



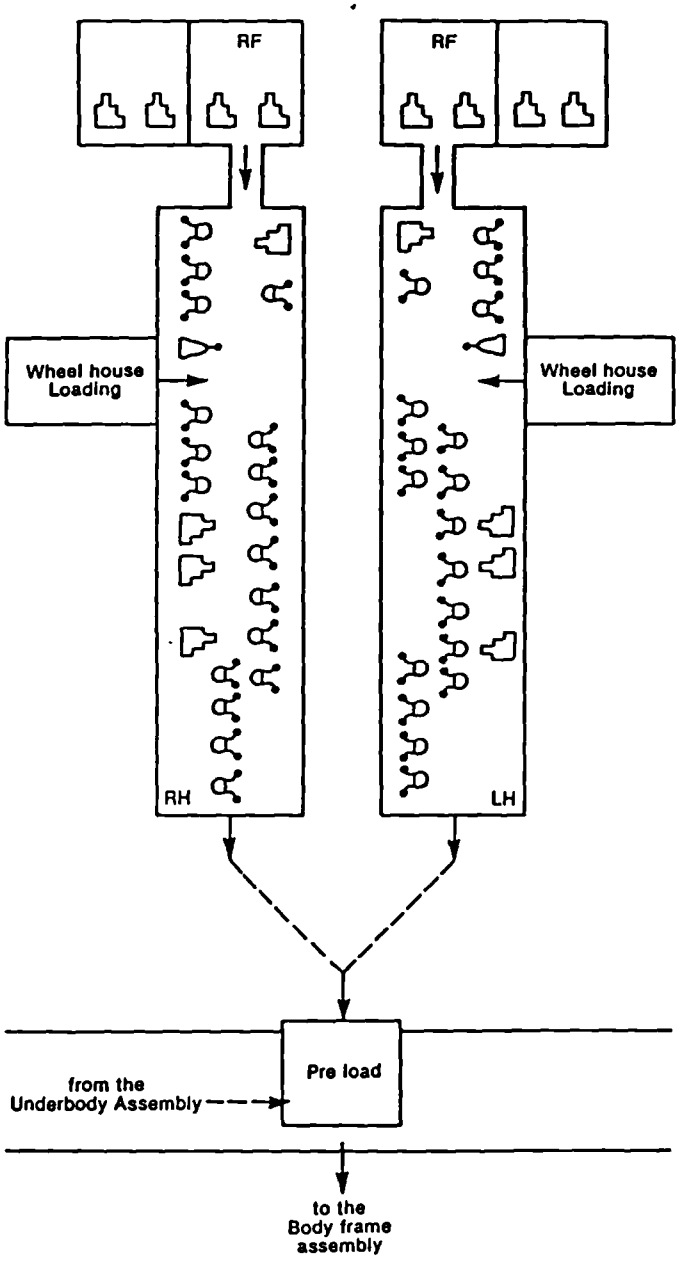
Source: *The Industrial Robot*, Dec. 1984, and fieldwork observations, 1985–6.

fixture (using 2 robots - type K - in a handling mode) and then matched with a rear cross-member and loaded manually onto a turntable. The rear floor frame (called 'H' frame) is completed by spotwelding tasks performed by 4 robots (type K). It is them married to the rear floor. The three sub-assemblies are passed through a four-post multiweld press and the rear floor is then automatically transferred to the main marriage station to meet up with the completed front floor and engine compartment.

The last process in the underbody assembly consists of welding the three main sub-assemblies - engine compartment, front and rear floors. In the underbody marriage station a shuttle beam takes the assemblies through two four-post multi-weld presses and then the complete underbody is transferred to an overhead conveyor to go to the Pre load area after passing through an inspection line.

The body side assembly complex (Diagram 2) utilizes a total of 54 robots: 52 for spotwelding and 2 for sealer operations. There are two lines in the area, each one approximately 120 meters long. At the head of the two lines there is a rotatory fixture. The outer skin and the reinforcing components are manually loaded by two direct production workers into the fixture which then turns through 180º for track welding by robots (type K). Then, the sub-assembly is transferred automatically by an overhead translift conveyor to the main welding line. The sub-assembly is then finish welded by a single floor-mounted robot (type K) and four overhead robots (type N). Sealer is then applied to the wheelarch by another robot (type A) prior to the introduction of the wheel-house components. Two direct production workers do the loading in the wheel houses. The assembly then passes down the line for further welding operations. These are

Diagram 2
Body side assembyl. Dagenham. 1985.



Robot type K

Robot type A

Robot type N

RF Rotatable Fixtures

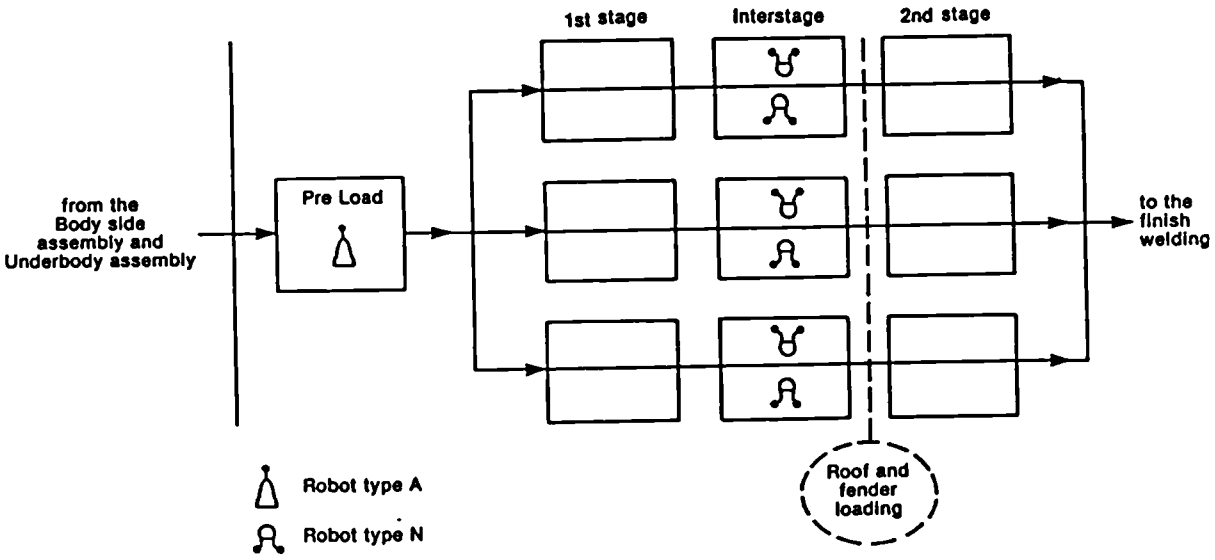
Source: *The Industrial Robot*, Dec. 1984, and fieldwork observations, 1985-6.

undertaken by three floor mounted robots (type K) and 14 overhead robots (type N).

The completed bodyside is then automatically unloaded and placed on an overhead conveyor system for transfer to the pre load.

The body frame assembly area (Diagram 3) has three lines and two robots (type N) are employed on each line.

Diagram 3
Body frame assembly, Dagenham, 1985.



Source: *The Industrial Robot*, Dec. 1984, and fieldwork observations, 1985-6.

In the pre load the bodysides and underbody are assembled manually using tabs, together with the cowl top (studwelded by a robot -type A), front and rear headers and lower back panel. The tabbed shell is then manually loaded into the first stage framing buck where multiwelding is carried out. Then the frame enters the interstage where further spotwelds are automatically applied by six robots Type N prior to the addition of front fenders and roof which are installed by operators. Following the interstage, the shell enters the second framing stage buck, is multiwelded and the complete body frame is ready for finish welding.

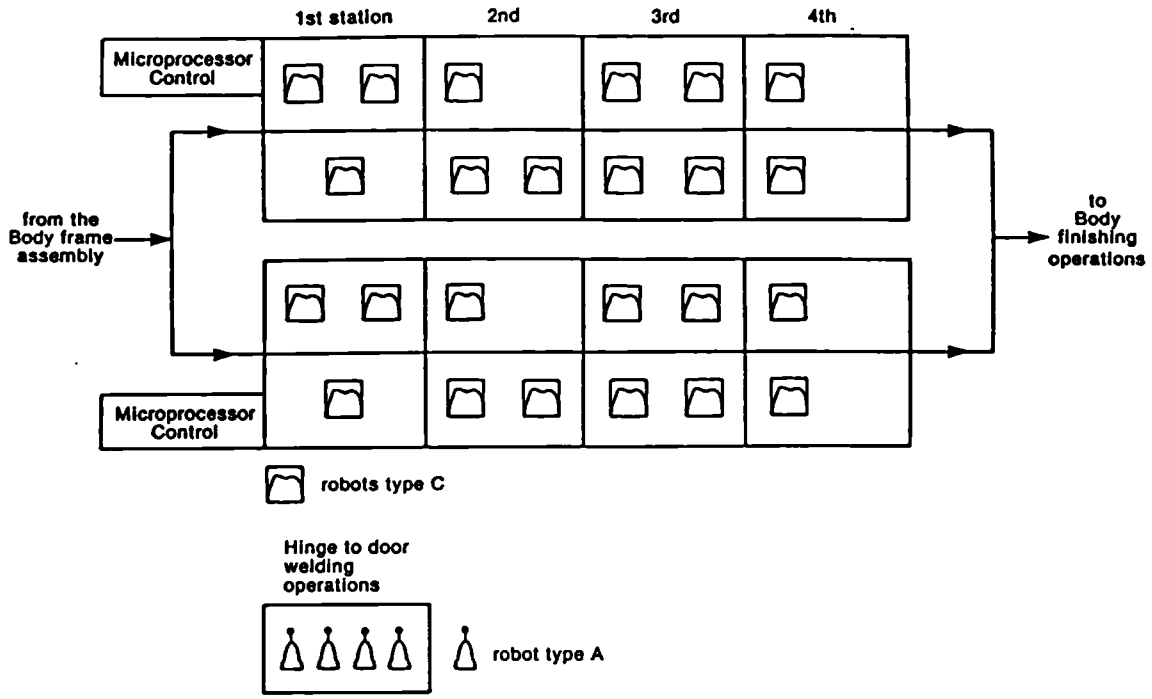
A main panel desk summarizes the state of work at each work station with a closed circuit TV covering 'troublesome' areas. Maintenance workers operate in pools on a teamwork basis. (See Chapter 9 for the operation of maintenance pools).

Finish welding (Diagram 4) is done in two lines by 12 robots (type C) per line. The lines are called Respot Lines. Forty three body frames are finish welded per hour in each one of the two lines. The area comprises 4 stations. The robots employed for finish welding are the most flexible ones. There are no production workers in the area. Only a few maintenance people are employed in there: 4 or 5 per shift.

There are four special features of the equipment installed for finish welding operations:

1. The respot line robots can carry up to 64 programmes and it is a simple matter for the robots to recognize which body shell it is about to weld, and change its programme accordingly.

Diagram 4
Finish Welding, Dagenham, 1985



Source: *The Industrial Robot*, Dec. 1984, and fieldwork observations, 1985–6.

2. The lines use heavy duty skids which carry the tacked shells into the welding lines and into fixtures. A model code identification is also carried by each body/skid through the line. This identification is achieved through electronic signals, processed by the line controller, and enables the individual CNC controller at each robot to select the welding programme appropriate to that particular style. Thus body shells of any version can appear in the line at random. Normally, however, it is one of 3 Sierra body styles.

3. Since the robots in each line are arranged in groups in close proximity to each other and their reaching axis is very large, specific instructions in the CNC software are included to prevent any 'internecine clashing' of welding guns. Upon entering an area of the body which is served by more than one spot welding gun, each robot communicates with other robots at the same station to ensure that sequential welding occurs in a safe manner.

4. Although continuous throughput is planned, contingency arrangements are provided so that each line continues to function if one or more of the stations are empty.

The equipment in finish welding follows a five step sequence of operations.

1. In order to enter the finish welding lines, the tack-welded body shells are automatically placed onto a beam transfer system which conveys them along the line of robots.

2. At the head of each line a microprocessor controls the status of each of the stations in the line and indicates their operating status visually on an illuminated panel. This microprocessor controller decides which of the two lines can accept the new body-in-white. It also monitors other functions such as component present/absent; in front of welding position; clamped/unclamped; initiates welding cycles and provides feed-back when welding is complete to initiate the next transfer between stations.

3. At the first station, the body-in-white is lifted clear of the build skid, and locators and clamps are applied. The clamps hold the body in a rigid and accurate shape producing just the correct amount of stress during progression through the welding lines. However, the power locators not only position the body accurately but their action or travel also provides the necessary signal pattern which identifies precisely which of the six body styles (3 for the Sierra and 3 for the Fiesta) is being held. These locator movements (or non-movements) initiate recognition signals which permit decisions to be made by the CNC unit on each robot to select whichever welding pattern is

appropriate for the particular bodyshell.

4. Transfer between stations is carried out by a shuttle system. The body shell, after location and clamping, is lowered again onto the build skid which is moved mechanically to the next station where it is again lifted clear of the build skid and locked in position by precision locations for the work to be done in the next three stations.

5. At the end of the line the complete shells are unloaded automatically onto a conveyor system prior to metal finish and the fitting of bonnet, doors and tail gate.

Another welding operation related to Finish welding is done at a separate location with two stations where hinges are welded to front and rear doors by 4 robots (type A).

Both Sierra and Fiesta bodies are sent to the automated finish welding lines, although the traditional finish welding process, a respot line carroussel, is also in use for Fiesta bodies. This is retained because of the availability of the old equipment and experienced workers who would otherwise be redundant. According to one manager 'It is not worth changing for the moment'. 'What would I do with them?', he asked, pointing to the workers.

Metal finishing inspection was still done by touch and sight in September 1985. Kerosene was sprayed over the body frame to highlight faults which could be identified by inspectors using their hands and eyes for doing so. After passing so many machines working on their own it came as a surprise to see such an activity done by a man! Expressing my surprise to the manager who was accompanying me I got the reply that 'It will not last long. The trouble is: a

machine costs a lot and this can easily be done by men.' In September 1986 I observed that improvements had been made to these jobs. Kerosene is now sprayed on automatically and the body frames pass down a huge brightly lit tunnel for human visual inspection.

Out of the 370 workers employed in this area, approximately 30% work on the Sierra and the remainder on the less automated Fiesta. Unfortunately accurate figures for the numbers of operators on the shopfloor by operation are not available.

The direct and immediate consequence of these changes in the production process in body assembly has been the displacement of 400 production workers. Most were later redeployed, the majority being sent to Final Assembly. Other major consequences including changes in job contents will be discussed in Chapters 6 and 9 in the broad context of industrial relations in the company.

Body construction at São Bernardo, 1985/6

Because the case study focuses on the production of internationally saleable cars, the process of assembling the Escort body will be described in a greater level of detail than the assembly of other models that continue to use more traditional processes. However, enough information is provided to make possible a comparison of how cars are made in both traditional and modern types of process.

Press Shop at São Bernardo

Since 1983 Ford has bought small stamped parts (weighing less than 300 grs.) from external suppliers. All other stamping jobs are done internally.

The raw material cames from COSIPA and USIMINAS, two State owned companies. Cutting sheet steel has been done automatically since 1976 when the Corcel II was introduced. The presses are set according to a service order that establishes the cutting plan.

At São Bernardo do Campo the stamping itself is carried out in 3 different plants. One is very modern (Building 16), while in the other two (Buildings 4 and 36) work is done by more traditional processes.

In Building 4 there are 21 big presses on 4 press lines, and 34 small presses. The jobs carried out here consist mainly of a general hardware of small parts which are applied to the vehicle and engine but not welded to the chassis, notably axles sub-assemblies, suspension axles, instrument panel framings, oil carters and cylinder head covers.

In Building 36, jobs for the underbody of the car, such as body side and body framing, are carried out in 70 big presses on 13 press lines, and 26 small presses.

In Buildings 4 and 36 the stamped parts are usually piled up manually and the presses are fed manually. Since 1975/76 jobs have been done in the same way with 4 or 5 men allocated to each press (2 or 3 men at the front and another 2 or 3 at the back of the press). One innovation was introduced to the door press line where a mechanical device automatically transports the stamped steel onto the track. For stamping different parts press die set-ups need to be changed. This usually takes 2 hours and is done once in each 24 hours. While the die set is being changed in a big press the foreman redeploys his men to work on the

smaller presses.

Building 16 is called the new stamping plant. It was built in 1982 and has one 'Sliding Bolster' press line and one CNC, plus a 1.500 ton. transfer line introduced in 1983. Ford prides itself on being the pioneer in this sort of equipment in Brazil. Before installing this transfer press the company used to buy stampings for Escort production from Japan.

Stamping in this new plant is entirely automated. Three workers operate the Komatsu Transfer Press. The one who is in control of the machine was previously a machine operator and received two months training before becoming a press operator on the new equipment. His wage did not change. Two other men work at the back of the equipment, piling up stamped parts. The new equipment produces major labour-savings. For example, in the production of the inner panel-hood for the Escort, 14 pieces are produced per minute by 3 workers (at full capacity it would be 19), compared to a conventional line where half of this production would be achieved and 12 workers would be required to produce the same piece.

The CNC Schuller is automatically fed and lubricated. It has 5 press stations, stamped pieces can be turned the other way around, it operates 3 times as fast as an ordinary press line (10 to 20 strokes per minute on the inner pannel-hood) and requires no one to work on it. However, its efficiency is not matched by other working areas. To avoid production imbalances and bottlenecks stamped parts from it are piled up manually by two workers. According to a document produced by the Factory Committee in 1985, one worker on the new automated press equipment replaces the jobs done by 21 press workers on the old

presses.

Also in Building 16 4 small Japanese Aida presses and 2 robots for stamping small parts have been installed for over one year. Area management say that the jobs do not need to be done automatically, but because the equipment was available it was being used as an experiment. In building 4 there are 6 small 'Aida' presses that were imported from Japan at the time of the introduction of the Escort. They are similar to the ones in building 16. These 6 small presses are the same as another 8 also located in building 4, which were built by Gutman in Brazil. It is not clear why Ford was given permission to import equipment that was available on the domestic market. Nor was it clear at this time whether the experiment with the 4 presses and the robots in the new stamping plant was to be continued.

The main problems in the traditional process are bottlenecks, the die changes, and the coordination of the sequence of operations and synchronization of the work tasks. These problems are avoided in the modern process.

Stamping workers work in 3 shifts from Monday to Friday. The overlap of 4 ½ hours between the second and third shifts makes it possible to deal with bottleneck jobs. Management aims to achieve a work pattern that eliminates this overlap but still maintains 5 days working.

As table 5.2 shows, total hourly employment is 1.117 and the ratio of direct to indirect workers is 2.4 to 1. 32% of the workers are in Building 4, 63% in Building 36 and 5% in the modern stamping plant.

Body Assembly at São Bernardo

The body assembly plant has one shopfloor for assembling the underbody and body side of the Escort, and another where the same jobs are done for the other car models. After the body storage area, once the body frames are completed, all the models proceed in mixed sequence through the remaining activities concerning the body construction, the paint, trim and final assembly stages until the delivery stage. Most of the work in the area is carried out on three shifts.

Assembling the Escort body

The Escort body is assembled in a series of automatic processes. The plant organization is described below and illustrated in diagrams 5, 6 and 7.

In the underbody assembly (Diagram 5) 48 workers are employed per shift.

Rear floor: Stamped parts are delivered on overhead conveyors and welded by 2 Kawasaki/Unimate robots. The rear floor has 3 parts that are welded by a Veno multiweld that transfers the assembled floor to the marriage station. The welding of these 3 parts was formerly a difficult manual operation.

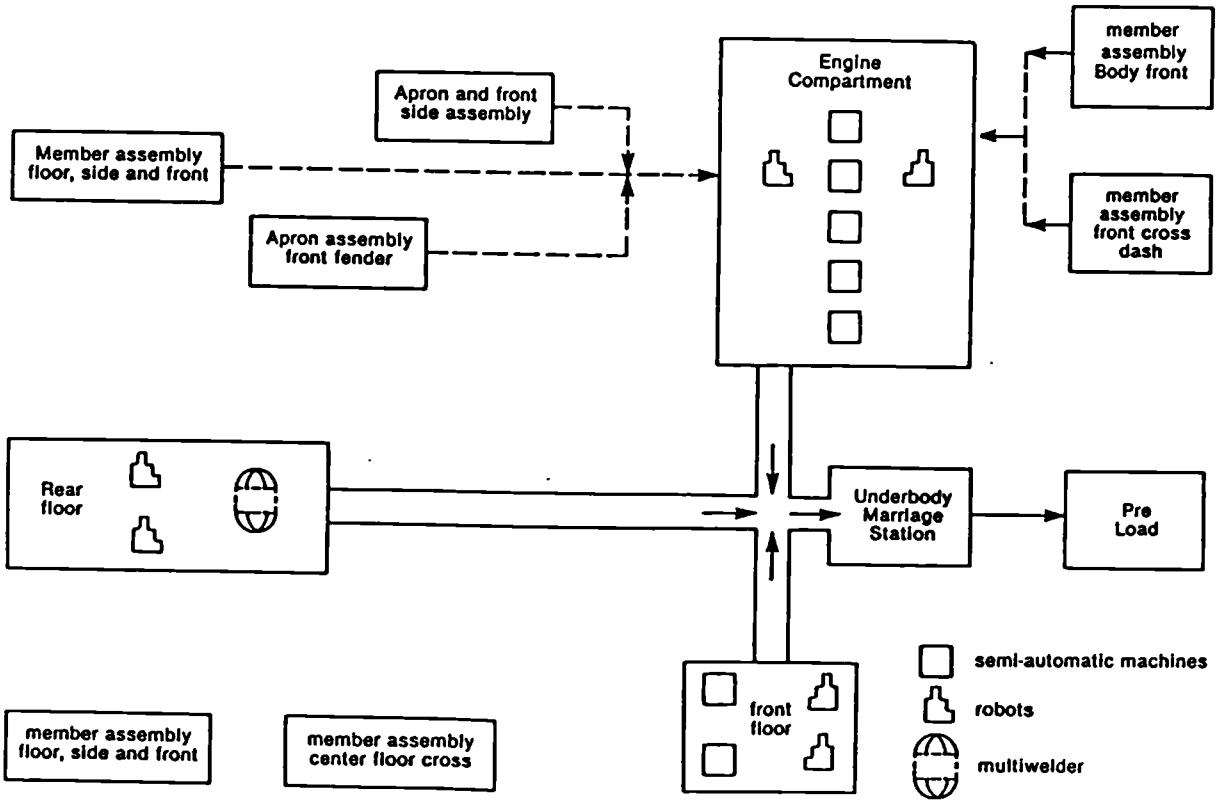
Front floor: 4 semi-automatic machines receive stamped parts from overhead conveyors and are joined together and spot welded by workers using the semi-automatic equipment.

Engine compartment: As in the previous operations the various pieces come down from overhead conveyors, but in this case they remain attached to the line by clamps.

Workers at benches and 2 robots assemble the pieces and send them to the underbody marriage station.

Underbody marriage station: The rear floor, front floor and engine compartment are assembled to form the underbody of the car. A transfer machine places the parts in the right position and they are assembled by a Veno multiweld. Following this, there are 3 stages of manual welding at the marriage station before the underbody is ready to be sent to the Pre-load (commonly named 'Butcher' because the side panels hang like meat on a hook). More than 60 underbodies (equivalent to about 2 hours of production) are stored in the Pre-load to prevent possible interruptions in the production process.

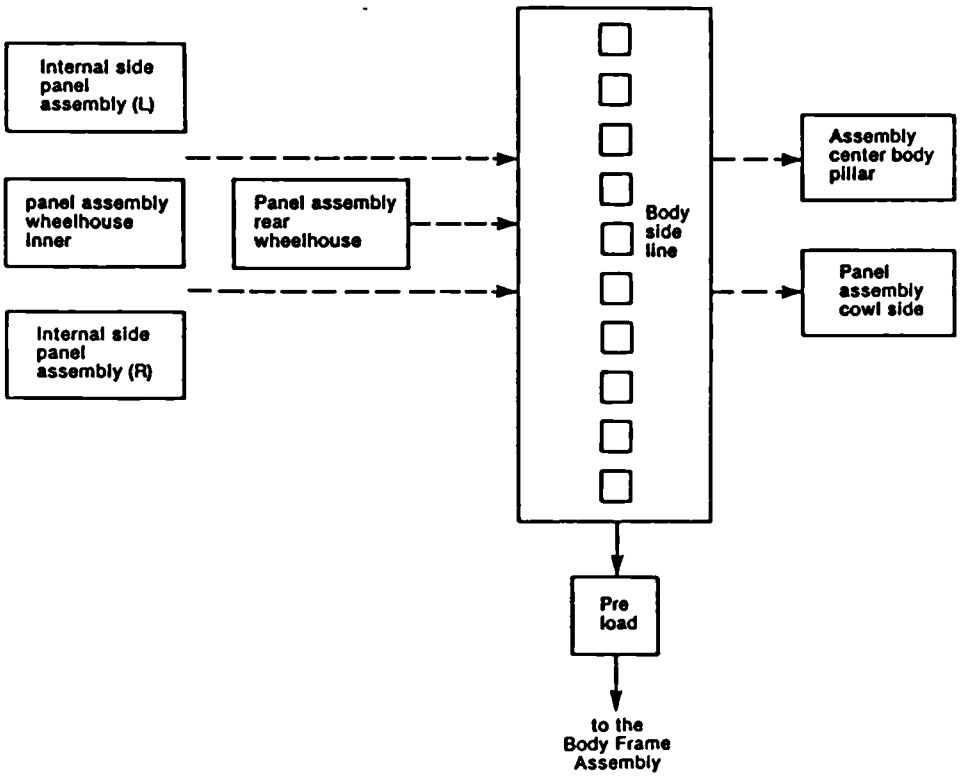
Diagram 5
Underbody Assembly—Escort—São Bernardo, 1986
(involves 48 men)



Source: Plant blueprints, Jan. 1983 and fieldwork observations, 1986.

In the body side assembly (Diagram 6) 35 workers are employed on each shift. As in the underbody assembly all parts movement is done by means of overhead conveyors. Unlike Dagenham, a considerable amount of sub-assembly on the panels is done on adjacent sub-assembly lines. At Dagenham, this work is done in the Press Shop.

Diagram 6
Body Side Assembly—Escort—São Bernardo, 1986



Source: Plant blueprints, Jan. 1983
and fieldwork observations, 1986.

The first job involves automatic CO2 welding in a closed cabinet. Engineers state that this cannot be done manually because of the precision required and the danger that the glare might damage the sight of the operator.

In the internal side panel sub-assembly, seat belts are fixed, and parts are assembled and spotwelded manually for reinforcement. This is considered an easy task that is used as a sort of training for less experienced workers.

Two automated stages follow. In the first locks are reinforced and the gutter is welded. In the other car models this is done at a later stage by tinsmiths. In the second stage both side-panels and wheel boxes are placed and welded.

Spot welding is done manually for the preliminary location of components that are to be automatically welded later on. The neck of the fuel tank (reservoir) is attached on the right side.

3 Kawasaki/Unimate robots and one operator also do preliminary location spot welding. The robots spotweld in a straight line and the operator in curves. The job done by the operator used to be done by robot but good quality could not be achieved. The first and third robots work continuously on one body side each. The second robot operates for half a cycle on each side; in tandem with this robot an operator does both right and left body sides working at great speed and moving around to the next position as soon as he finishes working on the first.[14]

---

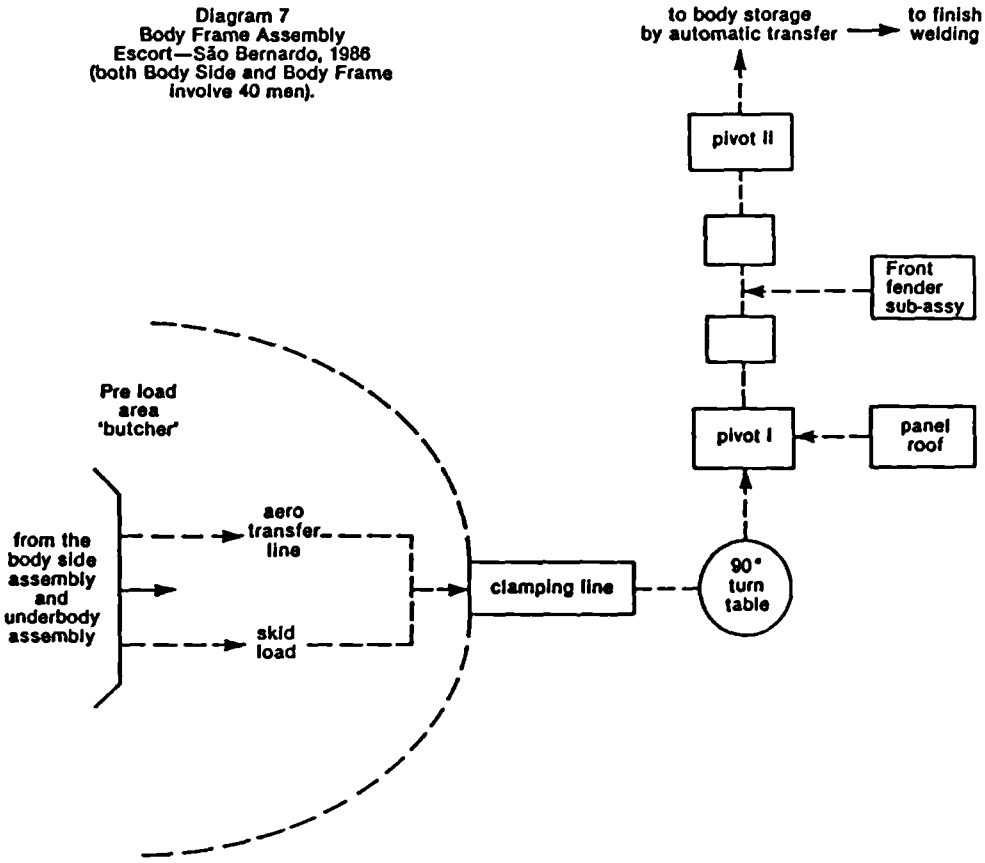
[14] At Dagenham a robot type A, of a more sophisticated type than the ones used at São Bernardo, welds the wheelarches.

Assembled pairs of side panels are automatically transported by electronic controlled overhead conveyor and are carried up to the body side pre-load area (also called 'Butcher') by a pneumatic system. Active sensors in the transfer line control the movement of the side panels to the body marriage station.

Body frame assembly (Diagram 7) is carried out by 5 workers per shift.

Directed by sensors, the 'Butcher' releases the side panels. One operator lines up a pair of skids under both side panels which enables them to be joined to the underbody. These skids remain in the body frame until the wheels are put on in the Trim and Final Assembly area. Another operator locks the 4 points which attach the panels to the skids.

Diagram 7
Body Frame Assembly
Escort—São Bernardo, 1986
(both Body Side and Body Frame involve 40 men).



Source: Plant blueprints, Jan., 1983 and fieldwork observations, 1986.

The underbody arrives and is automaticaly placed between the body panels which are then spotwelded manually by one operator. Other supports and components are also welded on manually by 2 other workers.

An automatic hinge transference or 90º turntable moves the frame to the next station. The final jobs in the area are carried out on two big automatic machines - Pivot I and Pivot II. The panel roof is automatically joined to the underbody and body sides and crossbars are placed on the roof. One worker watches over these operations. The frame of the car is ready. It already looks like a car.

The frame of the car is fixed to Pivot I and both automatic and manual spotwelding is done. An operator spotwelds the hinges into place in the door openings to prepare for the later instalation of the doors. Another man adds welds at the rear-end of the car in places where it is said to be difficult to perform the welds automatically.

At Pivot II, to which the body frame is moved automatically, roofs and front fenders are spotwelded and some reinforcement welding is also done. Since the Escort has 2 types of roof, the ordinary fixed roof is fixed in this way, but, for the soft roof, only the preparation for its installation is done. The convertible model is then sent to the Kharmann Ghia plant for roofing.[15] The 'car' is then taken to the body storage area where a worker controls for quality visually and by touch. From this stage onwards,

---

[15] Kharmann Ghia entered production of sport cars in the late 1960s but soon abandoned volume production. Along with about 20 other companies it still produces exotic vehicles for the very affluent. Because of its specialization it also works on special contracts for the car multinationals in the São Bernardo area.

Escort bodies are handled in the same facilities as the older models.

Some special features for safety and control in the Escort body construction shop are worth noting. The line does not move until all jobs are completed. While it moves a song is played throughout the shop by loud-speakers placed along the line. This means: 'danger', 'keep alert', 'do nothing, but prepare to do your job as soon as the music stops'. Usually a very lively sort of rock and roll samba song is played. Programmable Logic Controllers (PLCs) control the stopping and starting of the line, machines and movements. When maintenance is required the line stops and the song is played. Maintenance in the area is done by electricians who are also familiar with the electronics of the equipment as a result of training at the time that the machinery was installed.

Assembling the older car models[16]

The layout of the Body Assemby plant changed completely when the Escort was introduced. However, the sub-assemblies of the new car and of the older models coexist in the same plant, although they are situated in separate areas until the body storage area is reached.

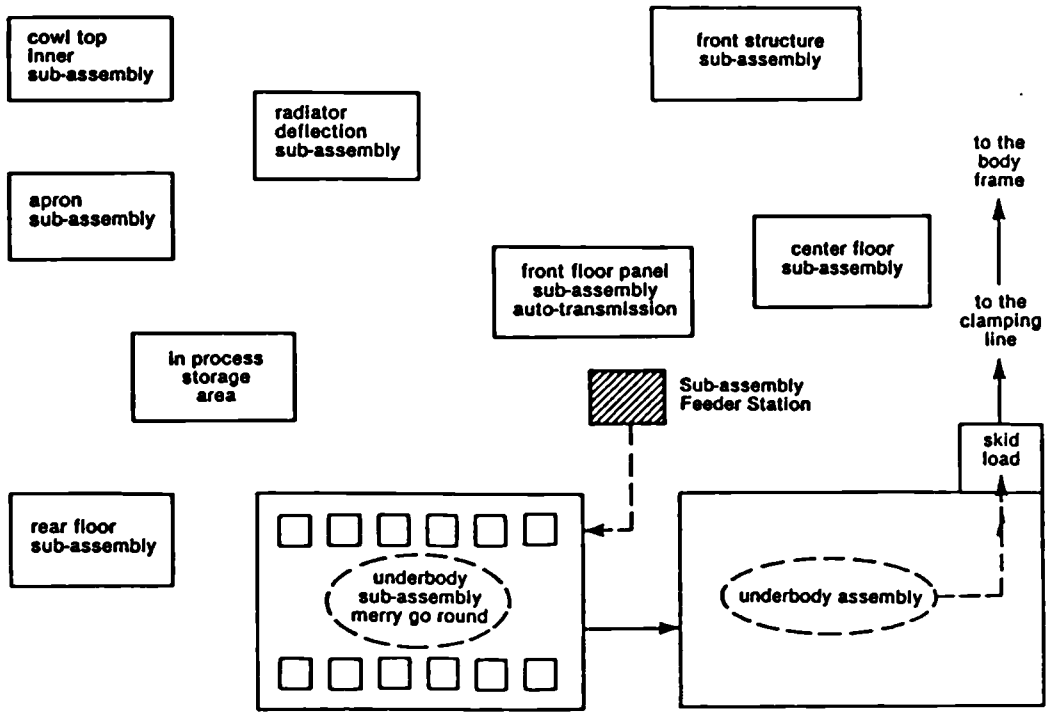
Assembling the older models is much more labour intensive than the Escort shop. (See diagrams 8, 9 and 10). Picking up the stamped pieces, joining them together, holding them in place and applying the nippers is all done manually. Spotwelding is mainly done by workers helped in some positions by low capacity multiwelding presses for

---

[16] The older models are Corcel, Del Rey, Belina, Scala and Pampa.

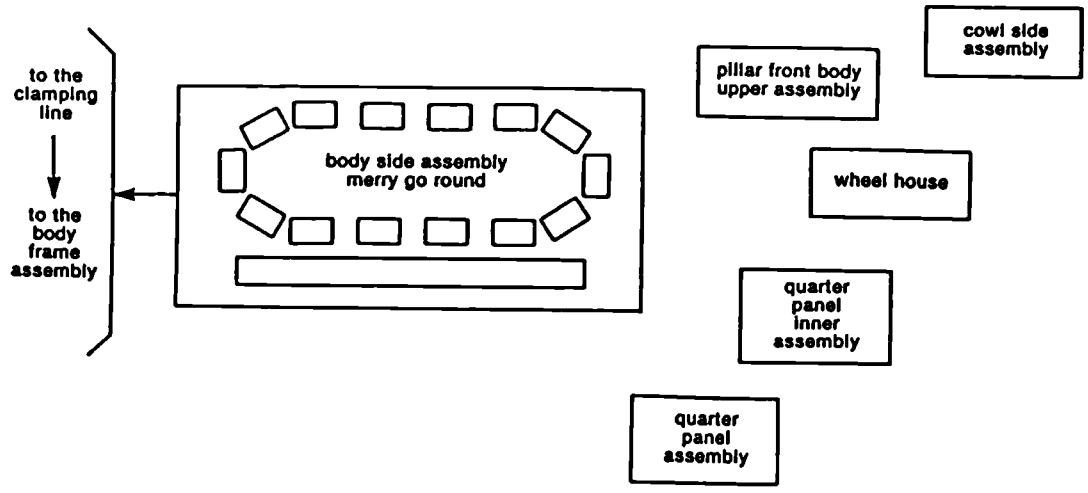
simultaneous welding. Releasing nippers and transferring sub-assembled parts is done by men. There are also workers whose job is to transfer pieces around the plant and handle materials needed by the welders. During the sub-assembly process heavy pieces have to be moved around, and more physical strength is required. The marriage of the different parts of the underbody, as well as the marriage of the body side assembly, is done on a carroussel. The movement of the track is electrically controlled by the foremen, and the workers do not move.

Diagram 8
Underbody Assembly. (Old Models) São Bernardo. 1986.
(Involves 110 workers)



Source: Plant blueprints, Jan. 1983; and fieldwork observations, 1986.

Diagram 9
Body Side Assembly. Old Models. São Bernardo, 1986.

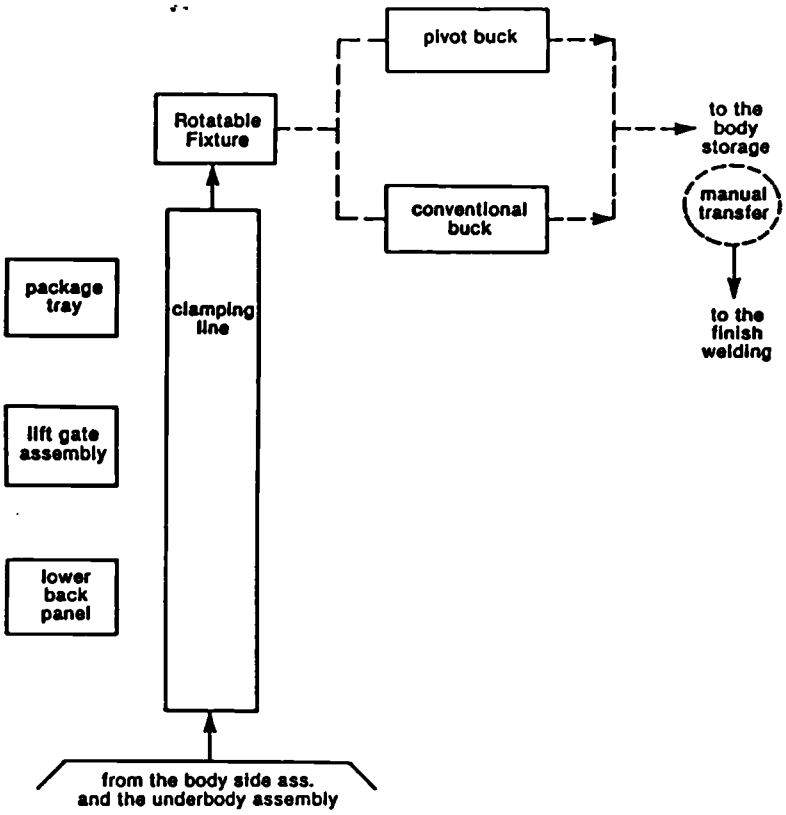


Source: Plant blueprints, Jan. 1983; and fieldwork observations, 1986

Once the underbody and side panels are joined together, the body frame is pushed manually to final reinforcement welding. This is either done in an electronically controlled multiwelding press - PIVOT - (the most sophisticated equipment in this area (introduced in 1977) that is able to weld 28 points per minute) assisted by two operators, or in the so-called 'spider', a more conventional piece of equipment that holds the body frame so that welding jobs can be done by operators. Engineers claim that the introduction of the PIVOT helped to ease the working pace in the sub-assembly. The selection of which equipment each car will be sent to is done at random depending on machine availability. The body frame is then manually transfered to the body storage area. From then on the bodies are mixed with Escort bodies for subsequent operations.

Compared with the Escort shop the sub-assembly shop for the older models looks a mess. The working pace is more intense, the equipment is heavier, there are more workers and it is smoky and noisy. Wages, however, are the same on both shopfloors.

Diagram 10
Body Frame Assembly. Old Models. São Bernardo. 1986
(together with the body side assembly involves 59 men).



Source: Plant blueprints, Jan. 1983; and fieldwork observations, 1986.

Body assembly processes for Escort and older models

After the body storage area, the Escort and the older models proceed together. A stock of bodies sufficient for two hours production is kept in the Body Storage area. Repairs are also done at this stage and a small plate is inserted in each car by the production control man containing the specifications for accessories, color, etc. that provide the instructions for all future operations in the assembly process.[17]

---

[17] Although the Pampa is a van model, it is produced on the same lines as the other car models. There is a special Body Assembly area for this model's production up to the 'respot line'. From then on it joins the other models. Workers involved in the Pampa body assembly are counted in with that for the other models.

Leaving the Body Storage area the cars go to a transverse line where operations are done on the back of the body. They are then sent to the respot line.

The respot line is 80 meters long. Spotwelding on the under-side is done by 17 welders: on the top-side by 24 welders. Certain operations require the welder to enter the car. Many operations are carried out by welders raising and lowering their bodies and moving around a lot. The final job in the respot line, rotatory CO2 welding, is done by 10 lower paid welders.

In the tinsmith shop jobs are considered to be an 'art'. It is considered a highly skilled job that requires ability and experience. There are 15 workers in this area. With the introduction of the Escort the Tinsmith line was entirelly changed. Under the old system movement of pieces was done manually and significant physical strength was required from operators. Nowadays, transference of parts is done automatically, controlled by sensors, and workers do not move around the line.

From the Tinsmith line, Escort models, which are identified by electronic sensors, are sent to a tin bath (an unhealthy area where oxygen maskes are used by the operators) designed to improve the quality of the steel, while the other models continue on the line.

A process called highlight follows in which kerosene is sprayed to help identify defects using sight and touch. This is also considered to be a work of 'art'. Repairing defects identification here requires the highest level of skill on the shopfloor.

The final process is the inspection of metal finish quality by inspectors. A kerosene bath is aplied to take all the grease off. The body frames are then dried and cooled and are ready to be sent to the Paint Plant.

The sub-assembly quality control laboratory is very sophisticated. Cars are selected at random or picked out when problems are suspected. Before introduction of the Escort, checking whether all the specifications were consistent used to take 9 hours. Nowadays, thanks to the introduction of modern electronic controls, it takes only 3 1/2 hours. A computer programme specifies all the requirements and the machine compares every part of the car body with its specifications, checks tolerances, and identifies any problems.

The line speeds of the Escort and the older models is the same: two minutes and 28 seconds per car, equivalent to 26 cars per hour. On the mixed lines - tinsmith, respot and metal finishing - speed is double since they deal with production from both shopfloors: one minute and 14 seconds, equivalent to 52 cars per hour.

The older models shop accounts for 72.2% of employment in the area, and the Escort for 27.8%. (Table 5.3). The most labour intensive area is underbody assembly.

Table 5.3
Employment of direct workers in Body Assembly - São Bernardo
(January 1986 - one shift)

Jobs	Shopfloors			Total
	Escort	Other models		
		Corcel/DelRey/Belina	Pampa	
Underbody assembly	48	110	-	-
Body side assembly and Body frame	40	59	59(a)	-
Sub-total	88	228		316
Tinsmith	-	-	-	102
Respot line	-	-	-	34
Welding CO2 and griding	-	-	-	45
Metal Finishing	-	-	-	54
Total	-	-	-	551

(a) Includes underbody assembly .

Source: Ford-Brasil

Although much less labour is used on Escort assembly than on the other models, welding is only automatic for 17.4% of body frame welds, concentrated mainly in the engine compartment, rear floor and in the jobs of the two Pivots. (See Table 5.4)

Body construction in Dagenham and São Bernardo in 1985/6

The difference in job composition and lower numbers employed in São Bernardo stamping compared with Dagenham is possibly a consequence of sub-assembly jobs being allocated to the Body-Assembly plant in the former, and to the stamping plant in the latter notably at the body side assembly stage (See Tables 5.1 and 5.2, footnote (b)).

The Body Assembly plant in São Bernardo is organized in two separate production areas up to the Respot Line. One is

modern, with 7 robots and automatic transfer. It was built especially for the Escort models, launched in 1983, which, on average, make up half of daily production. The other very traditional production area had some of the operations renewed when the whole plant was rebuilt to provide space for the new assembly areas for the new model. Traditional processes are used for the other half of daily production, which consists of a mix of the other five models. From the Respot Line onwards, Escorts and the five other models (the Pampa, which has an exclusive production line up to Body Framing, is included at this stage) are all mixed until they are delivered to the dealers.

In Dagenham the Body Assembly shopfloor was entirely renewed for the Sierra launch in 1982. Some operations are done in the traditional way on some of the Fiesta models such as in the Respot Line (in a carroussel). Except for this, all the jobs are carried out in new facilities, which include 120 robots of four different types, and a system of fully automatic transfer and overhead conveyors.

Given the very different levels of automation for Body Assembly in the two sites, and the differences in technology and work organization in Stamping, it is very difficult to find a common measure of efficiency (especially since imports of stamped parts to Dagenham from the Spanish subsidiary have to be taken into consideration).

One commonly used measure of efficiency is cars per worker. On such a measure, São Bernardo appears to be less efficient. The 2,770 workers in São Bernardo's Body Construction make an average of 750 cars per day, an average of 3.7 workers per car. The level of output per worker in Dagenham is more difficult to estimate because of

the flexibly allocated 'general services' category. If 1/3 of these workers were located in Body Construction (the remaining 2/3 in Trim and Final Assembly), the average of 995 cars per day would be produced by 3,378 workers, resulting in a ratio of 3.4 workers per car. Only if 2/3 of 'general services' workers were located in the Body Construction area would the ratio of output at Dagenham be equal to that of São Bernardo. If this last assumption is correct, it would be plausible to assume that the lower manning level in Dagenham's Body Assembly is compensated by a higher manning level in the Press shop. This compensation would make Dagenham's Body Construction levels of employment/output more closely equivalent to São Bernardo.(See Tables 5.1, 5.2, and 5.11).

In addition to the very different automation levels, however, there are other differences which need to be taken into account including the location of jobs, (particularly whether sub-assembly operations are included or excluded), the design of the car models, and other aspects of production equipment. The best example relates to welding which is the main job involved in Body Assembly. New design specifications have reduced the number of welds required by the use of larger stamped parts. Better welding material and the accuracy of robot jobs have also resulted in a reduction of the number of welds applied. In the Cortina, the model which the Sierra replaced , 3,508 spotwelds were applied mannually. The Sierra requires only 2,274 spotwelds. The Escort produced in São Bernardo, however, requires 3,738 spotwelds, even more than the old Cortina. (See Table 5.4). The greater welding requirement can be attributed not just to the Escorts older design, but also to the production facilities in São Bernardo. When welding is done manually more welding spots are necessary to achieve similar quality specifications.

Table 5.4
Robots and spotwelding distribution for Body Assembly
Sierra in Dagenham and Escort in São Bernardo

Assembly	Sierra				Escort			
	Robots	Spotwelding			Robots	Spotwelding		
		Aut	Man	Total		Aut	Man	Total
Underbody								
Apron/front sdm	14	104	na	na	-	38	18	56
Engine compt	10	112	na	na	2	116	105	221
Front floor	na	na	na	na	1	56	90	146
Rear floor	4	40	na	na	1	144	84	228
Underbody compt	na	na	na	na	-	28	140	168
Underbody sub-assy	na	na	na	na	-	-	718	718
- Sub-total	28	256	na	na	4	382	1,155	1,537
Body side								
- Sub-total	54	714	na	na	3	74	675	749
Body frame								
Roof	na	na	na	na	-	8	-	8
Cowl top	(a)	-	-	-	-	33	46 (b)	79
Front fender	na	na	na	na	-	-	12	12
Panel lwr bck	na	na	na	na	-	-	37	37
Body fr.sub-assy	6	153	na	na	-	154	75	229
- Sub-total	6	153	na	na	-	195	170	365
Finish welding								
- Sub-total	24	648	-	648	-	-	1,087	1,087
Total	112	1,771	503	2,274	7	651	3,087	3,738
(% spotwelding)	(c)	(77.9)	(22.1)	(100.0)		(17.4)	(82.6)	(100.0)

na = not available.
(a) 1 robot for 11 studwelds.
(b) 62 more spotwelds are applied manually in the sliding sun roof model.
(c) 8 remaining robots are in use for Body Assembly: 2 for handling rear sidemembers, 4 for jigwelding door hinge assembly, and 2 for studweld applicance in the dash panel and cowl top.

Source: For the Sierra: The industrial robot, December 1982; for the Escort: Ford-Brasil, 'Manufacturing Engineering', n.d.

Since 82.6% of weldspots are applied manually in the Escort and only 22.1% are applied manually in the Sierra[18], the amount that workers have to do to assemble a given number of car bodies, is much greater in São Bernardo than in Dagenham.

Thus the higher level of automation in Dagenham's Body Assembly should favour considerably lower manning levels. But in fact this is not the case. Within São Bernardo, the new techniques of Body Assembly production reduce employment in relation to output. Thus, at São Bernardo, the underbody, body side and body frame of the Escort, which, on average, amounts to half of daily production, requires 88 workers. For the production of the other half - the other five models - 228 workers are required to carry out the equivalent jobs (Table 5.3). But at Dagenham, the higher levels of automation have a much less dramatic effect on manning.

Even though at Dagenham 54% of daily production are Fiestas for which not all the automated equipment is used, Fiesta production still uses more automated equipment than the older models in São Bernardo. In this light, it has to be asked why manning levels in the more automated Dagenham Body Assembly are so high, compared with manning levels in São Bernardo. Work organization and employment conditions seem to be important determinants of manning levels, efficiency and productivity differences as well as technology and product design.

---

[18] Source: Table 5.4.

3. Production processes for Paint

The painting processes were automated in both São Bernardo and Dagenham in the early 1980s. The main difference in the conversions was that Dagenham was gradually updated by modernizing the existing shop between 1980 and 1984, while an entirely new paint shop was constructed at São Bernardo, which started operations in late 1982.

The production process is the same at both sites (See Diagram 11). There are differences in the number of colours (15 in Dagenham and 13 in São Bernardo) and in model variations (2 in Dagenham and 6 in São Bernardo). Changing colours and adjusting the equipment to different car profiles is simply a matter of sending the right information to the computer. Nevertheless, it is possible that these variations could have implications for the complexity of production and could account for certain variations in work organization and productivity.

Paint at Dagenham, 1985/6

There are 998 hourly workers in the paint shop at Dagenham, the smallest of the car assembly shops in the plant. There are 2.3 direct workers for each indirect worker in the area (Table 5.5).

The painting system was automated gradually between 1981 and 1984. Before 1981 manual painting, using spray guns, was in use. After 1984 no major improvements to the paint process were made although adaptations have been made continuously and the layout was changed by extending the floor transfer system in order to facilitate quality inspection.

With automation employment levels were reduced. From 1981 to 1986 about 500 jobs were lost in the Paint shop and efficiency and quality increased.

The paint shop uses 15 different colors. The paint is produced in Britain and it is the responsibility of the suppliers to control its quality although the company itself also makes checks.

An average of 995 car bodies are painted each day. The system is set to paint 60 cars per hour. In September 1986 50 cars per hour were painted on average.

The level of first-time-right painting has varied during 1986 between 77% and 85% per day and was nearer the first figure on most days. This means that between 15% and 23% of the cars have to be repainted every day.

Table 5.5
Employment in the Paint shop - Dagenham
(November 1986)

A) Hourly workers ..... Direct workers (1) = 700
..... Indirect workers (2) = 298
..... total = 998
..... ratio (1)/(2) = 2.3

B) Employment of direct workers in a normal shift by areas:

Phosphate, electrocoat and sealing	= 73
Underbody PVC and primer surface	= 23
Primer polishing and material handling	= 14
Paint cabinets	= 26
Dry sand booth and repairs	= 28
Finishing	= 31
Small parts painting	= 1
Minor repairs	= 12
Two tone	= 13
Metal crib	= 3
Total	=224

Source: Dagenham, PTA shopstewards.

The process of painting a car at Dagenham and in São Bernardo is basically the same. The shops look alike, but the former is bigger and cleaner, perhaps due to the larger area. The paint process at Dagenham differs from São Bernardo in the Enamel and Primer coatings. Most of these applications are sprayed manually in Dagenham, whereas in São Bernardo 80% of Enamel and Primer applications are done automatically. Primer and Enamel are said to be difficult to automate though General Motors has recently almost entirely automated these processes. In 1983 the Company attempted to automate these applications but did not achieve good results and went back to manual applications, even though the automated equipment remained in the shop.[19]

Sealing application is one of the few production areas where women are employed at Dagenham. Since February 1986 12 women out of approximately 30 workers have been employed in the area. Ford intends to employ more women on other shopfloor jobs in the near future.

The last process in the Paint shop is buy-off, which is done by teams of 4 inspectors responsible for inspection and repair of each car. The painted car bodies are then sent to Trim and Final Assembly. The number of inspectors is to be reduced by May 1987 as a result of the 1985 Agreement.[20]

Compared with São Bernardo the greatest difference is in

---

[19] In late 1986 fully automated Enamel and Primer were introduced. However, the data in this study refers to manufacturing conditions before this improvement.

[20] The details and implications of the 1985 Agreement are discussed in Chapter 9.

the utilization of Statistical Control in the shop. This is very noticeable because of the existence of black boards and marker boards for recording production occurrences, standing useless and forgotten all over the shop.

Introducing Statistical Control at Dagenham has been very difficult, partly because of the lack of numeracy among the workers. Managers also felt that the company had put the cart before the horses. In the words of one manager: 'One day someone from central office told us we should introduce Statistical Control. A production manager said: 'Yes, we should do something about this'. And the boards where brought in all over the place. There was no training. The workers were not convinced they should do it. The boards are blank.'[21]

Another quality control issue arises in relation to cleanliness. Because of the great cleanliness required for painting the central heaters, situated in the roof of the shop, are covered with alluminium foil to prevent particles of dust falling down. However, although problems have been reported arising from fine threads falling from workers clothes, many workers could be seen dressed in ordinary garments rather than wearing standard-issue overalls.

Paint at São Bernardo, 1985/6

Ford-Brasil was having many problems with paint quality in the late 1970s. In 1978 the company drew up a project for the renewal of the Paint Plant but could not convince FMC to renew all of the shop at once. Instead, renewal was done gradually. In 1978 phosphate and electrocoat systems were

---

[21] For a further discussion of this issue in the context of Employee Involvement, see Chapter 9.

introduced involving an investment of US$ 13 million. Ford-Brasil became the pioneer in the use of electrophorese in Latin America. In 1981 US$ 17 million were invested in the introduction of a new primer process. This signalled the beginning of painting automation, and another US$ 40 million were invested in 1982 to build a new plant and fully automate the paint shop.

Thus, over the whole period US$ 70 million were invested in improving car painting facilities in São Bernardo. Besides the new facilities Ford also developed a programme together with their steel suppliers to increase the quality of their steel sheets. Eventually new alloys were selected for stampings and body panels to attain better paint quality.

The paint shop works with 13 different colors. Only one is specific to the Brazilian domestic market - a bright glitter finish. All the others are European colors. The paint is produced in Brazil by multinational subsidiaries. As at Dagenham, the control of the quality of the paint is the responsibility of the suppliers, but Ford also inspects the colours.

The paint process involves electronics, chemistry, physics, meteorology (to study humidity and atmospheric change) and metallurgy. Many of these depend on specific shopfloor conditions and have to be done locally. In terms of paint quality, management claim that there is no difference between Europe and Brazil. Nonetheless, the São Bernardo Paint shop is not considered to be in line with state-of-the-art facilities in some European plants. The equipment does not reach all the cars' surfaces and men are needed for some operations. However, the São Bernardo Paint plant has the capability to work on a varied range of car models. Model changes affect painting only if dimensions

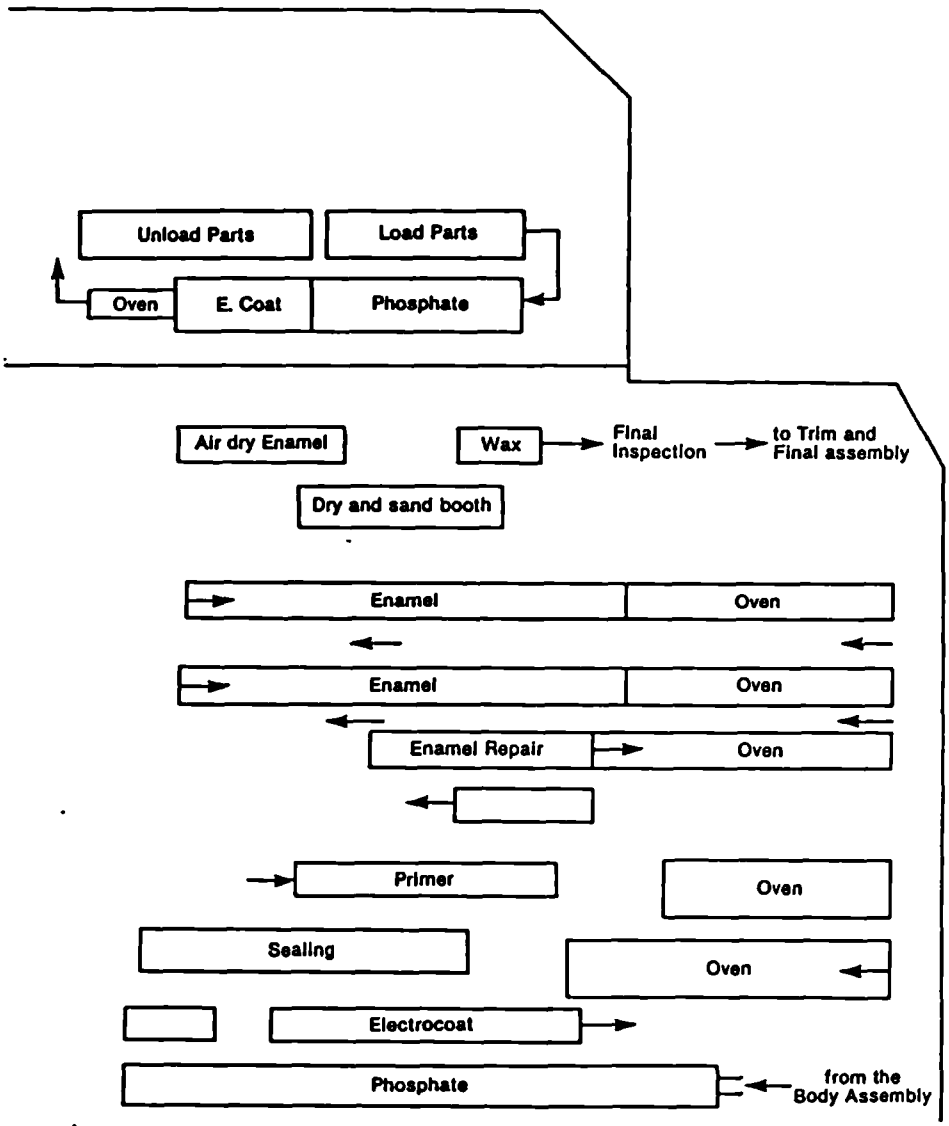
become too big. At present, painting different models is simply a matter of changing the computer program.

Painting is a very sophisticated job and requires extreme cleanliness. For example, as at Dagenham, after the move to the new paint plant problems arose from small pieces of fine thread falling from workers' overalls. The fabric of the overalls had to be changed. Unlike at Dagenham, the São Bernardo workers all wear the new overalls.

First-time-right levels in paint average 84% and only 16% of cars need repainting.

The process of painting a car involves 5 main stages. (See Diagram 11) The first, after the car arrives from assembly, is the phosphate dip. Workers control the process via electronic panels and identify each car model to the computer before each body-frame dives into the large tanks. The body-frames hang on a conveyor that makes them go up and down according to a programmed sequence of operations. After the phosphate the body frames are cooled because the electrocoat process that follows requires a temperature of 18º C. The third process is the sealing application, which is done manually. After passing through an enormous area where large and heavy pieces of equipment work automatically, moving cars up and down, sliding them forward, stopping to give them baths or to dry them, it is a shock to see people working. The manager who accompanied me said that the job was manual because 'it is important that one knows what one is doing.' - 'Don't robots know?', I asked. - 'Robots do not think, they would not be appropriate for this', he replied. The fourth process is the primer which is mainly applied in automatic painting cabinets, as is the enamel application, the fifth process.

Diagram 11
Paint Plant—São Bernardo, 1986 (1)



(1) The Dagenham paint shop is very similar.

Source: Plant blueprints, Jan 1983; and fieldwork observations, 1986.

In the automatic painting cabinets, photocells identify the car model and send an automatic command which adjusts the equipment to the car's profile and initiates the process. Photocells also read the plate in the body frame which indicates production instructions and selects the colour required, which is automatically supplied. Automatic washing of the used equipment follows the application of each coat. Primer and enamel applications are done automatically on 80% of the car. After the Primer coat there is a process called 'primer surfacer' that consists of manual checking and paint application to more difficult parts. Skilled painters are employed for these finishing jobs.

There are 908 workers in the Paint plant. (See Table 5.6) The great majority - 854 - are hourly paid workers. There are 3.7 direct workers for each indirect. Almost 2/3 of the indirect workers are maintenance workers. Maintenance in the shopfloor has to be very rigorous because of the high temperatures used. Many processes demand 150º C heating. If any maintenance is required while production is under way, it is a disaster because it takes 4 hours once the ovens have been switched off before someone can get inside them and another 8 hours to reheat the ovens.

The technical cleaning of the equipment is done by a subcontractor: Electrolux. Ford considers it too expensive to maintain the 32 mechanics and electricians with specialist knowledge that are required since they can only do these jobs during the weekends.

Table 5.6
Employment in the Paint Plant - São Bernardo
(January 1986)

A)	Hourly workers	..... direct workers (1)	=	621
		..... indirect workers (2)	=	233
		..... total	=	854
		..... ratio (1)/(2)	=	3.7
	Salaried		=	54
	Total		=	908

B) Employment of direct workers by shift:

1st shift: 07:00 - 17:00 = 285
2nd shift: 17:00 - 02:30 = 285
3rd shift: 22:00 - 07:00 = 51 (*)

(*) This is called the 'broken feet shift', and is concerned with minor operations.

C) Employment of direct workers in a normal shift by areas:

Phosphate, electrocoat and sealing	= 50
Underbody PVC and primer surface	= 38
Primer polishing and material handling	= 32
Paint cabinets	= 56
Dry sand booth and repairs	= 35
Finishing	= 39
Small parts painting	= 35

Source: Ford-Brasil.

Little was spent on training when operations were moved to the new plant. Workers were simply taken to see the new lay out before being moved. Moving was done in a 'back to back' manner: workers and cars in progress were taken to the new plant without interrupting production. Learning was achieved by doing. Statistical control was taught to everybody and is essential for the way the plant operates. As at Dagenham, at the beginning workers refused this training and refused to follow the instructions for statistical control. However, unlike Dagenham, nowadays, according to an area manager, workers have realized the importance of this technique and are pleased to have

learned it since they consider it has made their jobs easier. Some operators, particularly the ones who work in the electronics laboratory, were given special training to learn how to operate the programmable controllers.

The painting system in the plant is set to paint 52 cars per hour. In January 1986 43.2 cars were being painted per hour. According to the area manager production had had to be reduced because of a reduction in working hours due to coffee breaks and overtime bans arising from the actions of the Factory Committee. Moreover, in 1985 working conditions were improved by the installation of coolers and ventilators as a result of workers' demands.

Paint in Dagenham and São Bernardo in 1985/6

The equipment in use at Dagenham was acquired about two years before that at São Bernardo. Possibly the equipment in use at São Bernardo was acquired by the Company when problems such as the ones faced at Dagenham had already been solved through technological improvements. Although they are both new, they were renewed in a period of great technological advance in this area and there was a gap of about 2 years between the renewal of Dagenham and São Bernardo, which may have favoured the latter.

São Bernardo's expected efficiency, in terms of manning levels relative to production capacity, is slighly higher than Dagenham's. As Tables 5.5 and 5.6 show, with 998 workers Dagenham's expected production is 60 cars per hour, and with 854 workers São Bernardo's expected production is 52 cars per hour - an almost identical figure in planned cars per man per hour. In the months of my fieldwork, on average, the 998 workers in Dagenham were painting 50 cars per hour and the 854 workers in São Bernardo were painting

43.2. If Dagenham workers were working at the same production level as São Bernardo's, 50.5 cars would have been painted per hour - half a car more than actual production.

The level of Right First Time Quality also favours São Bernardo where an average of 16% of car bodies have to be repainted, whereas in Dagenham the average is 19%. Despite the small difference between the two, this implies raw material and working hours savings at São Bernardo.

Differences in productivity and quality can be related to some differences in the equipment, but work organization also presents some peculiarities. In contrast to the other manufacturing areas, the relative proportion of workers allocated to the Paint plant in São Bernardo (14.3%) is slightly higher than in Dagenham (13.0%). In terms of job composition São Bernardo's Paint has 3.7 direct workers per each indirect, whereas Dagenham's has 2.3.

The similarities between the Paint areas of both sites are nevertheless closer than those between the other two manufacturing areas. If certain efficiency and quality levels are to be achieved, it may be impossible to carry on this production process with a very different work organization either in terms of equipment or manning levels. It is possible that Paint processes do not vary as much as other production processes, being one of the 'rigidities' in modern production

Efficiency and quality differentials at both sites also have to do with different training for Statistical Process Control. This is more developed at São Bernardo, as part of a newly introduced Employee Involvement Programme. (See Chapter 9). As Unions had a say on this matter in Britain,

and have not cooperated with its introduction in Dagenham, further explanations could be found in the workers' organization and relationship to management at each site.

4. Production processes for trim and final assembly

The Trim and Final Assembly area includes four main activities: trim manufacturing, the fitting of components and fixtures, the assembly of major components into the car body and final inspection.

Trim and final assembly at Dagenham, 1985/6

There are 2,628 hourly-workers in trim and final assembly on the Dagenham estate, 34.5% of all car assembly workers in the areas under consideration. At Dagenham this work is done in two plants (PTA and River Plant) which are considered jointly in this section. At São Bernardo the same work is done in a single plant. The highest proportion of direct workers is found in this area, with 4.3 direct per each indirect worker. More than a half of indirects are maintenance workers (Table 5.7).

Table 5.7
Employment of indirect workers
in Trim and Final Assembly - Dagenham
Working in November 1986

Jobs	Total
Inspection (in two shifts)	132
Stocks (in two shifts)	115
Maintenance (in three shifts)	250
Total	497

Source: PTA shopstewards, Dagenham.

Upholstery jobs such as leather cutting, stitching, sewing finishing and other finishing operations on leather and plastic pieces are done in a separate shop called the River Plant. In there 250 hourly workers are employed, 55% (138) of them women (See Table 5.8). From the River Plant upholstery pieces are taken to the trim and final assembly shop to be fitted into the car bodies. Seats and cushion covers are sub-assembled by 250 workers in a special area adjacent to the final assembly lines. Steel seat frames and cushion stuffs are bought-in from external suppliers. Ford expects to introduce completely molded seats in 1987, eliminating leather cutting, sewing and assembling. This would eliminate around 400 of the existing 500 sub-assembly and assembly jobs on trim.[22]

In the whole of the PTA (Paint, Trim and Final Assembly, altogether) there were 340 inspectors in September 1986, but over the following eight months Ford intended to reduce this number to 60 as part of the new emphasis on on-the-job inspection. This reduction was to be achieved through voluntary redundancies and moving workers on to the lines, combined with the introduction of Statistical Control. New training for Statistical process control started in October 1986. This was a very simple training process: 'teaching workers to use the sheets and count things', according to one shop steward. As a result of the introduction of the Statistical Process Control inspection can be reduced because separate inspection checks will be done on 10% of all units rather than on every single job.

The 'PTA' (Paint, Trim and Final Assembly Plant) in Dagenham is more than 20 years old. It was called 'the new

---

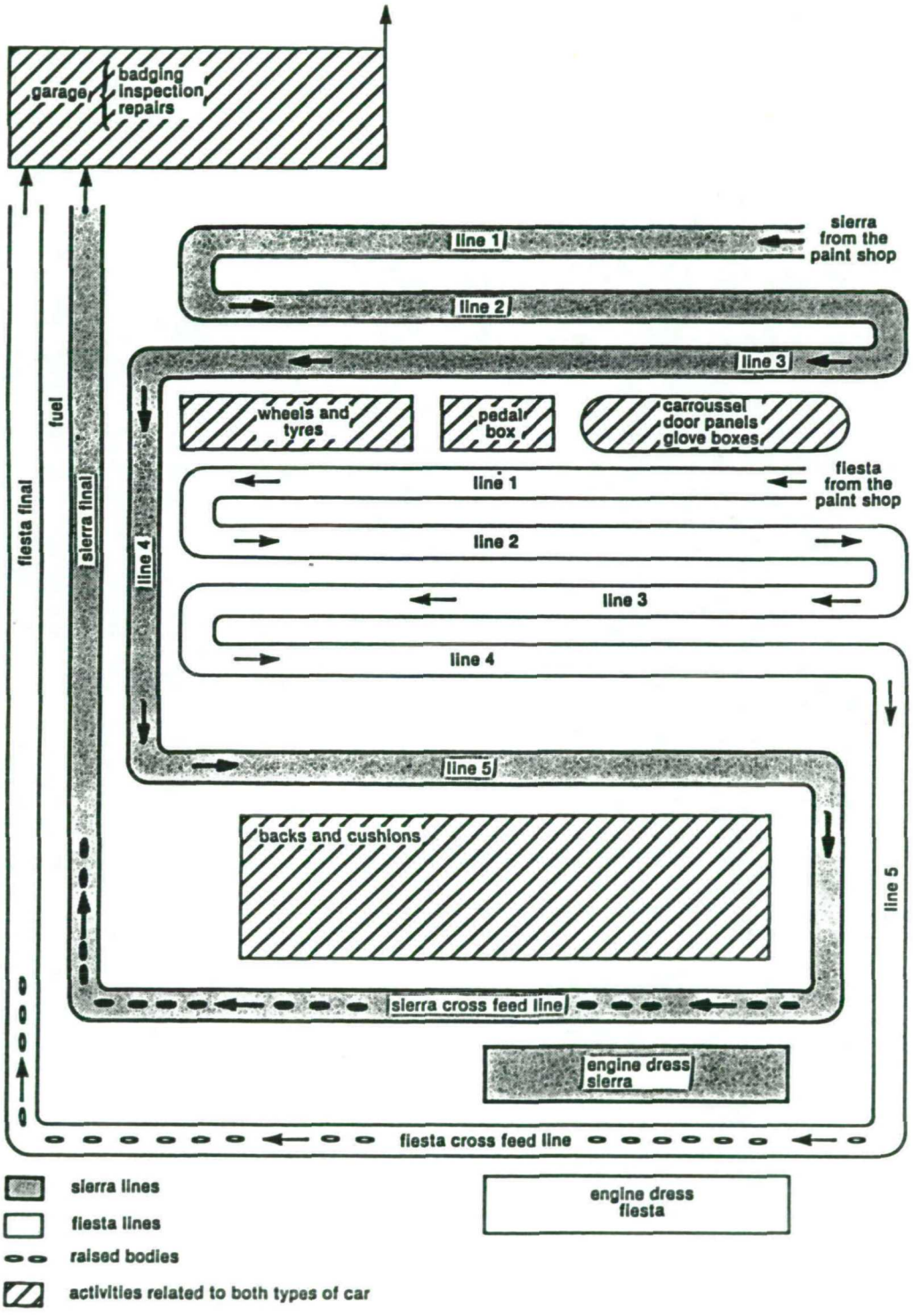
[22] In São Bernardo there are 231 workers on cutting and sewing, and 62 on seat and cushion sub-assembly.

assembly plant' when it became operational in 1959. Its lay out is based on Ford's old conception of having separate moving tracks for different car bodies. There are two very long sets of moving lines. At present one of them is for the Sierra and the other for the Fiesta. (See Diagram 12). There are fewer workers on the Fiesta lines than on the Sierra because the first is a new car, designed to be labour saving, whereas the latter uses many components from the old Cortina. The Sierra is not a whole new car nor was it designed specially to be less labour intensive in terms of trim and final assembly.

After the Paint plant, cars are sent to the Trim storage area. 60 to 80 car bodies remain stored to avoid any interruptions to assembly as a result of problems in the paint shop. Models are allocated to their respective lines for trim and final assembly by a worker. The processes that follow are very similar for both models. When different sub-assembled components are made up for each car model, they are either prepared at separate workbenches in the same sub-assembly area or carried out in separate areas. Engine dressing, for example, is allocated to two different working areas near the point at which engines are fitted into either rear wheel drive Sierras or the front wheel drive Fiestas on their respective final assembly lines.

This system of dividing the car models onto separate lines at Dagenham differs from the modern one-line system in use in São Bernardo. Another difference involves how the car bodies are held and moved along the lines. In Dagenham they are fixed to a track or conveyor whereas in São Bernardo they are attached to skids for trimming operations. Skids are more flexible than the tracks because each car has its own mobile structure, so that the conveyor does not dictate the car body's position at all times and allows for

Diagram 12
Trim and Final Assembly Plant—Dagenham, 1986



Source: Fieldwork observations, 1985–6;
and drawings by managers and shopstewards.

bodies to be taken off the line at designated places when this is necessary. Apart from this the use of skids also improves quality because the fixtures are less likely to damage any visible part of the car.

Table 5.8
Employment per shift in the Trim and Final Assembly Area - Dagenham
November 1986 (direct and indirect workers)

Location	Nº of shifts	Sierra	Fiesta	Total
- Trim lines	2			
(lines 1 to 5)		263	...	
(lines 1 to 6)		...	191	454
- Mechanic lines	2			
(Cross feed & final)		285	235	520
Sub-total (one shift)		548	426	974
(two shifts)		1096	852	1948
- Upholstery (River Plant, trim manufacture) (two shifts)				250
- Garage (two shifts)				266
Total (all shifts)				2464 (a)

(a) Company figures give a total of 2628 workers. The figure in this table, however, is based on an actual headcount by shop stewards at the time of the fieldwork.
Source: Dagenham, PTA shopstewards.

Although converting to a skid system at Dagenham is costly, its introduction is planned for Trim and Final Assembly in 1988. This will be part of a wholesale renewal of the shop, updating it to the modern concept of a one-line system for mixed model production from 1990. Workers on the shopfloor, as well as the unions, believe that it is simpler to work on the present system of two different lines. A comparison of the operations of the newer practices at São Bernardo shows that most operations remain the same, sequencing and fitting specifications are carried out systematically, and workers on the line do not move

any more. Efficiency and productivity may be increased using the one line system: data on this will be discussed later on. Observation gives the impression that in São Bernardo workers are busier and the workpace more intense.

One innovation in the trimming process has been in use at Dagenham since 1981: automatic windscreen fitting. Many problems of water leakages resulted at first and many adjustments had to be made before the screens fitted properly. Windscreeens are still fitted manually in São Bernardo.

It takes from 5 to 6 hours for all the operations to be accomplished in the car body at the trim and final assembly shopfloor depending on the daily work schedule. Once the car is ready it is taken by a driver to the adjacent Garage area. There the last fittings are added and tests for final acceptance inspection are done. Details of how these tests are done were not available and I was not allowed to observe them. However, comments from interviewees suggest that the procedures are broadly similar to those at São Bernardo.

Trim and final assembly at São Bernardo, 1985/6

The trim and final assembly area at São Bernardo includes upholstery, trim and final assembly, final acceptance inspection (FAI), and consumer acceptance inspection (CAI). Uphpolstery jobs are done in the upper floor of the building where Powertrain operations are located. Trim and Final Assembly is done in a modern plant built in 1983 for Escort production. FAI and CAI are also located in a new building.

Trim and final assembly altogether is the second most labour intensive area on the site, employing 27.8% of the total hourly paid workers in the areas under consideration. 2/3 of these workers work in the new trim and final plant. The ratio between direct and indirect workers is the highest on the site: 3.9 direct workers to 1 indirect (Table 5.2. See also Table 5.9).

Indirect workers deal with quality control, line inspection, maintenance of pneumatic, mechanical, electric and electronic equipment, and material control such as line feeding, materials reception and warehousing.

Table 5.9
Employment per shift in the Trim and Final Assembly Area - São Bernardo
January 1986 (Direct and indirect workers)

Location	Nº of shifts	Working
- Trim lines (lines 1,2,and 3)	3	306
- Mechanic lines (lines high, low and flat)	3	211
Sub total		517
	(on 3 shifts)	1.551
Upholstery	2	203
	(on 2 shifts)	406
FAI and CAI	2	136
	(on 2 shifts)	272
Total		856
	(on all shifts)	2.354

Source: Ford-Brasil

There are about 45 workers per foreman. In the new trim and final assembly plant the company intended to reduce this number to 12:1 by April 1986. The main aim was to improve

quality. Area management believe that quality in these operations depends almost exclusively on human performance.

There are 25 salaried process engineers working in the area. 12 of them were recently transfered from site management staff to work on trim and final assembly.

According to the area manager labour turnover is low. The majority of workers have more than 2 years of employment. The recent policy of reducing labour turnover has resulted in better productivy and increased efficiency as well as in reduced training needs.

Plant cleaning is done by the sub-contractor that is in charge of this job in the whole manufacturing area - Electrolux -, which employs 23 workers to clean after each shift.

Upholstery

Upholstery jobs consist of cutting, sewing machining and assembling front and rear car seats. The plant is organized in 3 lines: front seats, back of the seats and rear seats. Work is done in 2 shifts: from 7 till 5 and from 5 till 2:30, Monday to Saturday. Average production is 367 cars per shift. There are some very easy jobs in the area but, according to management in this area, training for 'an inteligent' worker takes between 1 and 2 months. There are 6 wage grades.

Very few changes have been made in the area since the introduction of the Escort. One new machine for glueing was introduced in 1983 using an electronic photocell.

Trim and final assembly

The trim and final assembly sequence is based on manual operations, except for the transfer of the painted car bodies and the delivery of most components and accessories (engine, transmission, fuel tank, wheels, etc.) to the lines.

Work organization in the new plant has changed a lot. In the old plant there were 100 stations on the trim line: this was reduced to 53 in the new plant. There were also 130 stations on the mechanic lines which were reduced to 28 in the new plant.

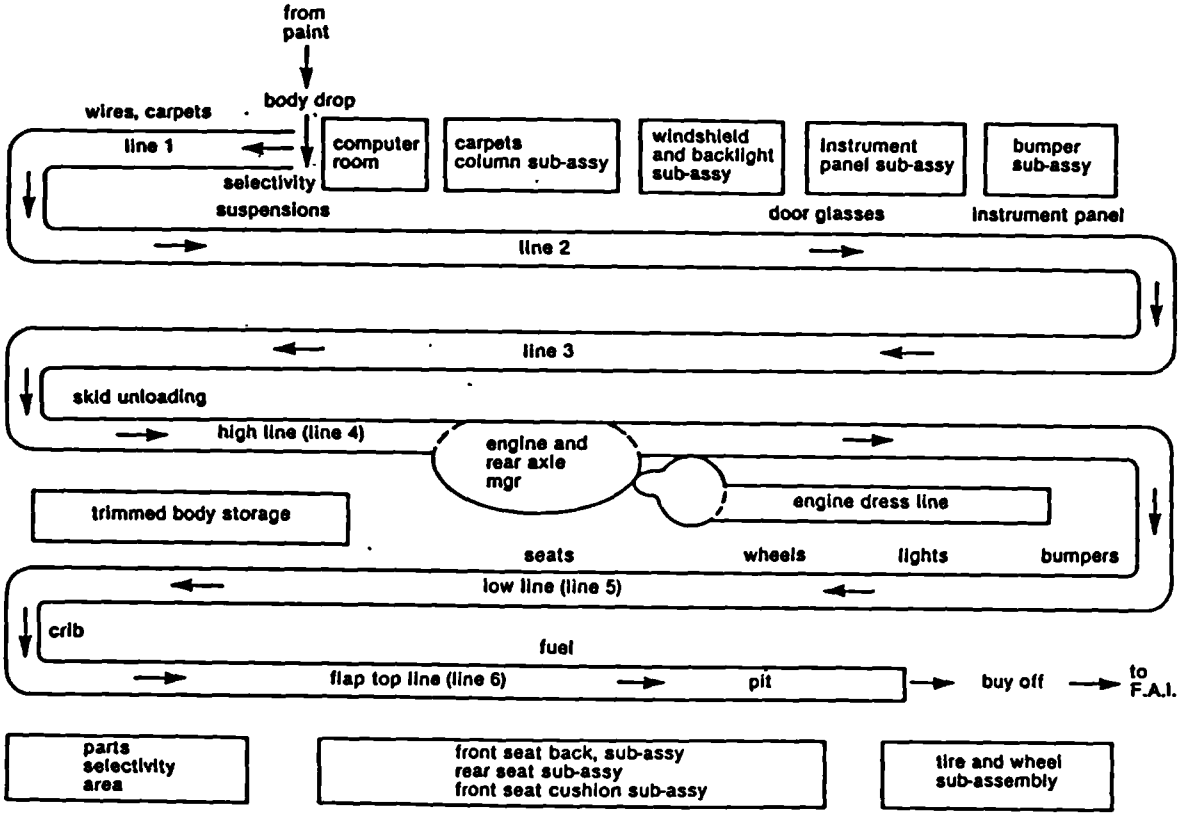
Production in the plant starts with computer registration of the models coming from the paint shop. At this moment 14 areas are informed that the car, with all its specifications, has arrived in the final assembly plant. A yellow light is automatically switched on when the car to be assembled is for export, meaning that a higher quality job is required (See Diagram 13).

The sequence of models on the line varies. Two identical models are never run in succession. When components are missing the Selectivity department adjusts model allocation to avoid stoppages on the line. ('Cripple' cars with components missing are never produced).

The Selectivity department is on an upper floor in a corner of the plant, and workers on the line have no control over model mixes. The space available in the selectivity area can accommodate 115 cars.

The final assembly route takes 6 ½ hours.Workers move around a lot following the car while components are

Diagram 13
Trim and Final Assembly Plant—São Bernardo, 1986



Source: Plant blueprints, Jan. 1983; and fieldwork observations, 1986.

assembled on it. The line speed is higher than the time allowed to workers to accomplish their operations and workers have to work up the lines.

Besides work on the lines, there are three important sub-assembly jobs in the shop:

1. Tyre and wheel sub-assembly: Tyres are selected according to the production specifications. They can either be Pirelli, Firestone or Goodyear. The tires and wheels are selected and placed on the track. The tires are then inflated and put back on the track, which moves them to the computerized wheel balancing station. After this they are put back on the track and taken to the main assembly line, where they arrive at the same time as the model they have been prepared for.

2. Front and rear seat sub-assembly: Seat assembly is closely linked to the upholstery area.

- The steel frame is brought in from external suppliers and seats are assembled on them. Frames are the same for all models.

- 62 workers, working in two shifts, produce 400 cars on the day shift and 380 on the night shift because the latter work 40 minutes less.

- Work intensification seems to be an important issue in the area although it was difficult to investigate. In the words of the area supervisor 'years ago car seats were made to last for eternity. Nowadays they are made not to last. Before it was more difficult to produce them and the jobs used to be done on workbenches. A good worker could produce 30 sets of seats per month.' Nowadays, 6 men working on the

back seats produce 10 per hour.

Once the seats have been assembled they are placed on conveyors in numerical order to synchronize their arrival at the low line to be fitted into the model and colour scheme they were made for.

3. Bumpers are also sub-assembled according to the specifications list. The Escort has different bumper fitments and design does not require screw attachments for its bumpers.

In the 6 trim and final assembly lines, jobs consist of fitting various components:

- Line 1: wires, some other electric components, and carpets.

- Line 2: suspensions, instrument panels, door glasses.

- Line 3: wiring connections, other electric components. The spoiler is fitted to the 'XR3 Escort'.

- Line 4 (High Line): heavier jobs are done, such as application of anti-corrosion paint to certain spots, wheel alignment for all models except Escorts, suspensions, exhausts, stabilizer bars, and the fittling of steering columns, rear axle and engines. Engines are final assembled in carroussels on one side of the main line, and their delivery to the tracks is synchronized with the arrival of their designated models.

- Line 5 (Low line): bumpers, lights, wheels, seats and oil injection. Wheels are automatically distributed to each side and an automated machine installs them. The seats

also have an automated right, left and rear distribution.

From this moment on the cars are free from the track.

- Line 6 (Flap top line): final engine adjustments are made, air conditioning and other accessories are installed, emission control equipment is connected to the carburretor according to the specifications required by each final market. 6 litters of fuel are put into each car.

The cars are then driven to the FAI in another building.

Final acceptance inspection - FAI

In FAI all the jobs are done with the car in movement. Work requires only specialized workers such as maneuverers (manobristas = in-house drivers), upholsters, adjusters, mechanics, painters, quality control inspectors.

The building has existed since 1974 and the range of jobs done is still basically the same. Yet, the way of doing them and the product requirements have changed a lot since late 1982. The layout was improved. At the beginning there were 2 lines and the cars were moved by maneuverers. Average production was 25 cars per hour. Nowadays, there are 3 lines and cars are automatically moved on skids. Average production increased to 45 cars per hour.

The three basic jobs done in FAI consist on:

1. Wheel alignment, which is done, in FAI, only for the Escort models. This is done in FAI because of the design in which the 4 wheels are aligned simultaneously. Also, the Escort's alignment is simpler because it has a rigid axle. In the other models wheel alignment is done in each one of

the 4 wheels separatedly at the moment they are placed in, at the Trim and Final assembly plant. The Escort is driven to where this job is to be done automatically by electronic sensors. Electronic controls correct simultaneously the alignment of both the wheels and the steering wheel. The operator of the electronic control equipment is the same person who drives the car from the Final Assembly plant to FAI. Once his task is finished he drives the car again, this time to FAI's transfer line.

2. Engine and steering tests. Before the car is moved to the transfer line the engine is tested to different velocities and temperatures. Gears are also tested.

Any problem found in the car is either corrected immediately (if the correction of the defect concerns that area) or it is recorded for further correction in the specific area.

3. Electric tests. Inspectors get inside the cars with a remote control connected to a computer. The computer directs the inspector to what has to be inspected and a list of the defects located is shown automatically on the computer screen.

One job that used to be done in all cars was wax appliance It was abolished as a cost reduction measure. In January 1986 only Escorts for the export market had wax applied along with additional emission control checks.

Consumer Acceptance Inspection (CAI) is responsible for the final O.K.. The cars are then ready for delivery to the dealers.

Trim and Final Assembly at Dagenham and São Bernardo, 1985/6

Manning levels in Trim and Final Assembly (Trim manufacturing included) are apparently higher in São Bernardo than in Dagenham. However, if some proportion - 1/2 or even 2/3 - of the workers in the 'general services' category is added to the indirect workers in Dagenham, the output of cars per worker would be the same as São Bernardo's, or higher. (See Table 5.11)

The type of jobs done in the two sites is the same, although the production processes are organized in a very different manner.

In Dagenham, the installation is not flexible and only two car models can be trimmed and assembled at a time because the work is organized along two lines, each programmed for a particular car model.

In São Bernardo the six car models come down from the Paint plant mixed up for trimming and final assembly along one line. The work organization there is more complex and makes more extensive use of computers. However, some operations at Dagenham, such as windscreen fitting, are automated, while similar ones at São Bernardo are not.

The variety of the model range produces the most significant variations in the way work is organized, and variants in styling and product specifications can further increase complexity in the production process. Some of the differences in the assembly process are intimately related to the design of the car. For example, in the older models at São Bernardo, the front of the car is assembled with the doors already in place, whereas in the Escort the doors are

installed after the rest of the assembly work is complete. This is a consequence of design differences in the side panels. The side panel of the Escort is a single stamped sheet, whereas in the older models the side of the car is assembled from many different pieces.

Fiesta and Sierra model styles produced at Dagenham (besides having both left and right hand drive styles) have numerous trim and accessory specifications. The same is true for models produced at São Bernardo, where in addition to varying styles, there are alcohol and petrol fueled cars, and different emission control specifications for different export markets which require varying assembly practices.[23]

Nor are the European and Brazilian versions of the Escort the same. According to an Area Manager at São Bernardo, "the external appearance of the Escort is the same, but the heart is not because the engine of the Brazilian one is absolutely Brazilian". More important for assembly, the components used in a Brazilian Escort would not fit a German Escort and vice versa. For example, the Germans have closed up the door openings to improve the appearance of their car. The Brazilians, however, retain the original design specifications because closing these openings would demand substantial investments in the stamping area and dies, fittings and trim templates would all have to be changed. Ford-Brasil considers that 2 millimeters in the door openings are not worth four million dollars.

New car designs continue to simplify the assembly process.

---

[23] In January 1986 12 styles of alcohol fuelled and 2 styles of petrol fuelled Escorts were produced. The latter were produced with four different emission control systems.

A comparison of the first Escort design with the new Escort that was to be launched from São Bernardo in July 1986 reveals a sizeable reduction in the number of components. In the old Escort, wings, shock cushions, claws and supports were all different pieces: in the new Escort they come in a single unit. Similar simplifications are notable in the cowl, rear lights and the instrument panel.

The modern design of the new Trim and Final Assembly plant in São Bernardo allows maximum flexibility for product renewal and further automation. For example, changing to the new Escort in 1986 requires only a 2-week lay-off in the Sub-Assembly plants. It is also relatively easy to introduce new models to São Bernardo. Ford estimate that investments of about $200-300 million would be needed to introduce a wholly different model like the Sierra: but the Orion, which is an Escort derivative, could be put in for only $25 million. It is possible that this will be the next new model produced at São Bernardo.

This compares favourably, in terms of flexibility, though not necessarily in terms of efficiency with the traditional concept employed at Dagenham. The levels of output per worker are very close, although no final statement can be made with the data available. In addition, from observing workers carrying on their jobs on both shopfloors, I considered the workpace more intense in São Bernardo. However, my impression could have been distorted by the presence of a greater number of people carrying on similar operations on different car bodies, whereas in Dagenham fewer workers are observed anywhere because the lines are separated.

5. The making of quality

Ford's approach to the process of making high quality vehicles was expressed by a Brazilian manufacturing area manager as 'quality is made by production, not inspection'. Quality control is done alongside all the manufacturing processes from the choice of raw material and the allocation of contracts to suppliers[24], to the moment that the car is delivered to the dealers. At this stage all the quality standards are checked against their targets.

Ford has a worldwide system of assessing quality. It has evolved over time. The present system is called UPAS- Uniformity Product Assessment System which replaced the less sophisticated Uniformity Quality Audit in 1980 as a means of improving the sensitivity of the audit to customer demands. It is based on a customer evaluation and is done daily in the plants.

The UPAS procedure consist of four steps:

1. A visual evaluation lasting about 40 minutes using a checklist of items, gauges and standards. If anything is found wrong it is given a weighted score. There are three score levels. 100% is the score given for something that will obviously result in a customer complaint. 50% is the score for something that will probably cause a customer complaint. Between 1% and 10% are scores that will probably

---

[24] Brazilian practice is based on a worldwide programme developed by Ford's Supply and Manufacturing Division and consists of a series of actions to promote improvements in supplier relationships to improve product quality and reduce costs. These actions began to be implemented in Brazil in 1983. Similar changes in the relationship with suppliers were implemented in Britain following the launch of the 'After Japan' programme in 1981.

not cause a complaint but which do detract from the customer ideal.

2. A structured test is conducted over various 5-mile selected road routes. The same process of scoring is applied again.

3. Static checks of water leaks, headlamps, steering tracking, breaks, windscreens, are carried out and the assessments are scored.

4. The cars are ranked by a system of summing up the scores and placing them on a standard scale.

UPAS utilizes the quality targets for each model, which are set by four areas: quality control, process engineering, manufacturing and maintenance. In order to increase quality the targets are revised downwards over time.

At São Bernardo, UPAS was introduced in 1982, as part of the general reformulation of manufacturing procedures. Since the beginning it has been one of the responsibilities of area management. The procedures at São Bernardo start with the random selection of 12 cars from daily production for assessment. Numerous tests on these cars are done during the morning and at 1 pm a meeting is held at which all the failures in the products are pointed out to the respective manufacturing area representatives. Besides the UPAS technicians, the area managers and apointed technical staff from the four plants related directly to car manufacturing (Body Construction, Paint, Trim and Final and Powertrain) plus personnel from the Buying and Product Engineering departments participate in this daily meetings.

A top director of Ford of Europe expressed his astonishment

at the similarities between São Bernardo and the European factories, when he went there, in early 1983, just before the launch of the Escort.[25] Two main issues struck him. Firstly, the division of labour indicated that 'conceptually the work is done in the same way'. Secondly, the organization of quality control (in relation to checks, gauges, methods of control, monitoring of suppliers, and the setting up of tooling), was all 'very much the same'.

Whereas UPAS is the plant-based daily product quality assessment, FMC has a much broader system of assessing the operations of its factories around the world through an Audit system carried out once a year. The criteria used by this system was not disclosed in any of the interviews carried out either in Brazil or in Britain. In some cases the discussion of the data from these Audits, which I have obtained, made the interviewees uneasy. Until 1986 Ford issued the results of the worldwide Audit to its subsidiaries and the results were known to many senior employees. However, the company has now stopped the internal publication of its worldwide comparisons because, according to one director interviewed, 'it became too contentious'. 'Sites ended up competing with each other and aiming to achieve the others' level. Also, it was hard to push for improvements above the best level. Nowadays, the emphasis is on continuous improvement, not any longer on improvements up to a certain level reached by someone else.'

Although the worldwide Audit may have caused problems for Ford, it certainly helped in raising the quality levels of the Escort produced at São Bernardo in its early days. The quality of the São Bernardo plant was considered generally

---

[25] Interview in December 1987.

competitive before the Escort was introduced. According to a Ford of Europe director, '... in some things they were better. For example, the São Bernardo's engine had more torque power. In finishing São Bernardo was competitive from the start.'. Similarly, a Ford-Brasil Area Manager stressed that, "The fitting and finishing of the Brazilian made car is better than the German in terms of component placement. The engine is of better quality too. Due to this the stability is greater".

But, in order to sell to the Scandinavian market the Escort had to reach a much higher quality standard especially for the more rigorous climatic conditions found in those countries. When they were shipped to Europe in 1984, the quality of Brazilian Escorts was rated between those of Halewood and those of Saarlouis. The target was to match Saarlouis quality in two years.

The monitor of São Bernardo's product quality at the time of the Escort launch was Ford of Europe. No one doubts that quality was increased because of the needs of the European market. According to Brazilian managers the Ford of Europe personnel in charge of the Escort's quality improvement programme were very ambiguous about their job. Brazilian managers' accounts reveal rivalry between the subsidiaries and also show a strong belief that quality depends a lot on the will of management. In their words: 'They (the Ford of Europe personnel) were helping us but also fearing competition.' 'They were helping us but they did not believe we could do it. They did not believe in us.'

Whatever the personal feelings of the European and the Brazilians, quality improvements in the São Bernardo Escort were achieved very rapidly. From March 1984 to September 1984 the quality problems of the Escort were cut to almost

the Saarlouis' quality level. Usually big improvements immediately follow the launch of a new car. However, the results achieved at the São Bernardo factory are described by management as basically the result of good management and labour discipline.[26]

Table 5.10
Quality scoring of the Escort in São Bernardo, Halewood and Saarlouis

	São Bernardo	Halewood	Saarlouis
March 1984	991	625	305
September 1984	343	na	na
January 1985	261	na	na
January 1986	213	na	na

Source: Ford-Brasil and Ford of Europe

The Ford Motor Company Quality Audit in January 1986[27] examined 59 sites of different car companies worldwide. The Escort produced in São Bernardo was ranked 11th amongst the best quality cars in the world. The Sierra produced in Dagenham was ranked 14th. In addition, we have already seen that data on Right First Time quality rates, (available only for the paint process) showed that São Bernardo's performance was better.

In the Brazilian site a Quality Programme has been implemented along with the 'Uniformity Product Assessment System' (UPAS). These policies in São Bernardo may have been responsible for the higher quality rates of the Escort in Ford's Audits. Equivalent policies, like UPAS, were introduced at Dagenham but no broader Quality Programme has

---

[26] Interview with Ford of Europe director.

[27] The 1986 Audit was the last one issued to senior employees worldwide.

been implemented.[28]

6. Similarities and differences in the production processes: technology, employment, efficiency and quality

The distribution of the hourly paid workforce amongst the three manufacturing areas of car production under consideration is similar in Dagenham and São Bernardo but the job structure is very different. There is a much higher proportion of direct workers (engaged directly in production) to indirect worker (engaged in cleaning, maintenance, handling material, production control, quality control) in São Bernardo. (See Tables 5.1 and 5.2) In Dagenham the ratio of direct to indirect workers is 1.4:1, in São Bernardo it is 3.1:1. One consequence is a reduced number of different job titles at São Bernardo.[29] Direct workers at São Bernardo do jobs that are done by indirect workers in Dagenham such as cleaning, in addition to their jobs on the production line.

Unfortunately, the category 'indirect' lumps together the most skilled workers with the least skilled and it has not been possible to separate out these occupations to clarify the full significance of the ratio presented. However, the company believes that the indirect category will be greatly reduced when they extract more flexibility from the workforce in operating the new equipment and that this is of great significance. The existing ratio is therefore thought to demonstrate greater flexibility in the

---

[28] For further detail see Chapter 9, section 5.

[29] The job structures in both subsidiaries are discussed in detail in Chapter 9.

deployment of labour in São Bernardo.

The number of cars produced per worker in the manufacturing areas is very similar in the two sites. On average, each car produced in Dagenham requires 7.7 workers and in São Bernardo 8.0 (See Table 5.11). This would mean that Dagenham would produce 14 cars more per day than São Bernardo if productivity could be measured so simply.

However, these 'productivity' levels can have different meanings if issues such as technology, the range of different car models produced at each site, product design, production requirements, work intensity and intensity in the use of the equipment are taken into account.

The effects of technology are reflected in the total productivity levels, but because technological innovation has been very uneven in the three manufacturing areas, there are major differences between the equivalent production facilities, in the two sites.

A further factor influencing productivity is the range of models in production. Dagenham produces two: Fiesta and Sierra. São Bernardo produces six: Escort, Corcel, Del Rey, Belina, Scala and Pampa.

The design and product specifications of the models produced for the Brazilian domestic market imply labour intensive processes of production. In the case of the new models considered here (Sierra and Escort), both were designed to simplify production requirements. The Escort, however is an older design with a greater number of stampings which requires more welding. The design specifications were based on the conditions of labour and technology available at the time.

The implications of this wide range of variables for the measurement of productivity levels go very deep. Industrial relations are very relevant for understanding such differences which are not related exclusively to technical issues of the production process.

For example, work intensity is different in the two sites. The data presented has generally been based on the average number of workers and the average daily output over a six month period at each site. However, this does not take into consideration variations in the length of working time.

The normal working week is 6 hours (15%) longer at São Bernardo than at Dagenham (45 hours compared to 39). Besides, in some operations, the intensity of the use of the equipment in São Bernardo reaches 24 hours a day, 6 days a week, whereas in Dagenham the general pattern is 20 hours a day, 5 days a week. Dagenham manufacturing has 2 shifts - 8:00 to 18:15 and 21:30 to 7:45 - working from Monday to Friday. São Bernardo manufacturing has a more heterogeneous shift system. Some areas operate on 2 shifts, some on 3, the number of workers per shift varying according to the jobs. For instance, some third shifts are just maintenance. Some areas work Monday to Friday, others Monday to Saturday. Part of the usual work done on Saturdays is overtime. The greater intensity of the use of both equipment and labour at São Bernardo is offset by more automation, designs simplification and a less complex model mix at Dagenham.

Table 5.11

Output per worker per day and other characteristics of the production process in Dagenham and São Bernardo

Areas	Dagenham			São Bernardo		
	Workers (1)	Produc. (2)	(1)/(2)	Workers (1)	Produc. (2)	(1)/(2)
1. Body Construction (Stamping and Body Assembly)	3,378(a) or 3,540(b) or 3,702(c)	995	3.4 / 3.6 / 3.7	2,770	750	3.7
- Nº of robots	120			7		
- Nº of spotwelding	Sierra = 2,274			Escort = 3,738		
- % of automated welding	Sierra = 77.9			.....Escort = 17.4		
	54% of output is Fiesta			50% of output is 5 other models		
2. Paint	998	995	1.0	854	750	1.1
3. Trim and Final (Includes Trim Manufacture)	2,952(a) or 3,113(b) or 3,276(c)	995	2.9 / 3.1 / 3.2	2,354	750	3.1
	- 2 car models mix - 2 sets of lines			- 6 car models mix - one line only		
Total	7,652	995	7.7	5,978	750	8.0

(a) Assuming that 1/3 of the 972 workers in the 'general services' category are employed in the area, in which case the proportion in the other area (either Body Construction or Trim and Final Assembly) will be higher than the ones hypothesized in the table. Excluding the fluctuating 'general services' workers, hourly employment in Body Construction is 3,054 and in Trim and Final Assembly it is 2,628.

(b) Assuming that 1/2 of the 972 workers in the 'general services' category are employed in the area, in which case ... (as above).

(c) Assuming that 2/3 of the 972 workers in the 'general services'...(as above).

Source: Ford-Britain and Ford-Brasil (see tables 5.1, 5.2 and 5.4)

Body Construction in Dagenham seems to be manned at levels considerably above those required for the operation of the existing equipment at average output levels. For instance, the 120 robots in Dagenham's Body Assembly give an advantage of about only 10% over São Bernardo in terms of output per worker. The more intense production pattern at São Bernardo offsets Dagenham's higher automation.

In Body Construction sub-areas, the proportions of workers in Stamping and Body Assembly are inverse in the two sites. The levels of automation are higher respectively in Dagenham's Body Assembly and in São Bernardo's Stamping. However, operations related to 'sub-assemblies' are done respectively in Dagenham's Press shop (stamping area) and in São Bernardo's Body Assembly.

These different job allocations make direct comparison of these sub-areas very difficult. Besides, comparisons of efficiency, particularly in Stamping are constrained by the variety of product (weight and kind of steel or the size and complexity of the stampings) as well as the international integration of Dagenham with the Spanish subsidiary for the supply of stamped parts. Moreover, there are more stamped parts to be assembled in São Bernardo, because of the production of older models with more transport, fitting, fixing, and labour-intensive welding than in Dagenham.

In Paint both the processes and efficiency levels are closer than in the other two areas. The third shift in São Bernardo involves 5% of the workforce employed in the area. This is called 'broken feet shift' ('turno do pé quebrado') and their jobs concern minor operations to keep the equipment running during the night. In the Paint shops of both plants production is more determined by the equipment

available, leaving less scope to compensate for differences in automation by the intensity and flexibility of the use of labour.

In Trim and Final Assembly the operations are roughly the same with the difference that only a few jobs are automated in Dagenham, while São Bernardo operates in a plant designed according to modern manufacturing concepts. Efficiency levels appear to be very close. In this case the more modern facilities in São Bernardo are offset by the greater number of tasks required to produce six models compared to two in Dagenham.

Certainly these data require some explanation as to what besides technology determines efficiency and quality and about why different strategies for technological renewal were undertaken in the two sites. Consideration of other features of work organization and employment conditions in each site provide a more complete framework for such an analysis.

In the Chapters that follow the changes in the relations between management and workers in face of the new production processes implemented in the mid 1980s in both sites are analysed.

Chapter 6

INDUSTRIAL RELATIONS IN BRITAIN AND LABOUR ARRANGEMENTS AT DAGENHAM

In their discussion of whether there have been any radical changes in industrial relations in the British motor industry in recent years, Marsden et al (1985) highlight the following factors:

1. Facilities given to shopstewards and their involvement in many bargaining issues have been considerably reduced.

2. Pay bargaining arrangements have become uniformly based on company level systems rather than the former plant level bargaining.

3. Management structures have been reformed and have reasserted the 'right to manage'.

4. Product market strategies are no longer hindered by industrial relations

5. New production processes have been introduced based on microelectronics.

6. Manpower levels have been drastically cut.

7. Increased flexibility of deployment of labour has been introduced.

8. Greater security of employment has been offered for the employees who remain.

It is my view that only the last four of these issues apply to Ford's recent practices in industrial relations. The

other issues have been radical changes in other British motor firms but have existed at Ford for many years, although some new emphasis has been put upon them lately. In the context of these historically different patterns of labour arrangements, it is possible to hypothesize that Ford's strategies have been quite distinctive in the 1980s, as has been the usual pattern compared to the other car producers in Britain.

In this chapter, the roots of the present state of labour relations at Ford UK will be outlined, with special reference to the transformations in the 1980s. This involves considering: the workplace, site, industry, national policies and politics. Employment relations shifted in response to the labour market, technological innovations, union pressures and shifts in market demand. Most of the time several of these pressures were operating simultaneously to shape the new pattern of labour relations.

The subsequent two chapters present a parallel discussion of the broader context and roots of Ford-Brasil's industrial relations system.

1. The broader context of labour relations in the car industry

Britain's industrial relations system is distinguished by certain important historical features, many of which are a sharp contrast to the Brazilian pattern.

1. The relatively limited role of the State until the 1980s.

2. A system of collective bargaining based on negotiated agreements.

3. Management and union preference for informality and agreements on a custom and practice basis.

4. A complex union structure with elements of craft, general and industrial unionism often inter-mingled within the same union.

5. The close involvement of shopfloor workers in union activities concerning work and workplace power relations.

6. An absence of a clear articulation between national and local structures.[1]

The general pattern of official union representation of car workers has been multi-unionism. Each union has a particular internal structure, size, and a different status in terms of its recognition and participation rights in negotiating bodies. Unions do not always represent the same categories of workers in each of the car companies.

Over the years each of the car companies formulated general policies to integrate the trade unions into more unified negotiating bodies. These were designed to fit each company's need for a negotiating body to standardize employment conditions. In this way, as many different structures and agreements as there were companies came into existence.

This diversity required some coordination between the

---

[1] See Fox, 1985; Palmer, 1983; Hyman, 1987; Clegg, 1972; Bain ed., 1983.

companies and between workers belonging to different trade unions at different levels of the representation system.

Until the 1950s, most car manufacturers belonged to the Engineering Employers' Federation (EEF) and attempted to base concessions on common rules, and establish minimum weekly wage levels and basic employment conditions. However, the two American subsidiaries, Ford and Vauxhall, never joined any Employer's Association. In the late 1950s and 1960s the car manufacturers formed a group for the exchange of information on earnings, which became a formal body - the Motor Industry Industrial Relations Panel - in 1961, under the aegis of the Ministry of Labour. But it did not last long and in the early 1970s British Leyland/BLMC also left the EEF. In general, car companies have only ever had very weak co-ordination of their employment policies.[2]

Many studies have pointed out the difficulties of analysing labour relations in the motor industry in terms of a common pattern of development, or similar structures. Analyses of industrial relations issues in the industry are generally made on a company by company basis, reflecting the structure of British employer and union organization.[3] When

---

[2] For an analysis of problems between employers associations and the State in the 1950s and 1960s see Tolliday, 1985. For general references see Turner et al, 1967, p.35.

[3] The main company case-studies are: 1. Ford Halewood: Beynon, 1973 (1984). 2. Ford-Britain (focusing principally Dagenham): Friedman and Meredeen, 1980; see also, Passingham and Connors, 1981. 3. The Midland manufacturers, especially Standard Motors, Rootes and Jaguar (before they merged into British Leyland): Tolliday, 1986b; 4. British Leyland: Willman and Winch, 1985; 5. Austin Rover (formerly BL) Williams, K. et al, 1987. General analyses concerned with industrial relations in the car industry include: 1. Turner et al, 1967, which explains strike activity patterns up to 1964 and points out Ford's exceptional position arising from its particular

generalizations are made, Ford is consistently presented as the major exception either because it does not fit in with the prevailing national pattern of the industry, or because it leads the way in major changes of pattern.

Some views about trade union organization in Britain stress the impact of the British craft tradition in developing strong unions as early as the turn of the century. In this interpretation unions have inherited privileges long possessed by skilled craft organizations. These are the roots of workers resistence to 'management's right to manage'.[4]

Other historical interpretations based on the car industry case stress that from the early 1920s when mass production was introduced until the late 1950s and early 1960s, unions were weak in the factories. For a long time management had a free hand to organize production, and establish payment systems and forms of control of labour. The consolidation of union power in the 1960s curbed management control. In the 1970s new managerial strategies in industrial relations were developed.[5]

This account of the context of industrial relations in the

---

industrial relations system; 2. Marsden et al, 1985, which examines the changing patterns up to 1984 in the light of the past history of the British industry and the recent pattern of international competition. Each of the 4 major manufacturers (Ford, British Leyland, Vauxhall and Talbot) are considered although the analysis is heavily based on the case of British Leyland.

[4] See Fox, 1985; Palmer, 1983 (Ch. 6).

[5] See Tolliday, 1986b; Turner et al, 1967; and Zeitlin, 1980. The discussion of the industrial relations system in the motor industry relies basically on these three authors. Cf. also Tolliday and Zeitlin, 1985.

car industry in Britain will focus on three issues: the trade union organization, pay systems, and the collective bargaining. Special attention will be paid to particular features that concern Ford directly or which relate to developments that have affected Ford policies and performance.

The trade union organization

Different forms of union representation and collective bargaining bodies exist in the car companies. Nevertheless, it is sufficient here to point out the existence of varying patterns and to detail Ford's specific arrangements and exceptional features.

Before the late 1950s and early 1960s union penetration in the car industry was very small. Seasonal fluctuation of employment and the hostile attitudes of employers prevented union growth. Few British companies had extensive union representation. The two American subsidiaries, Ford and Vauxhall, did not recognize unions in their plants until near the end of the Second World War, following the policies of their parent companies.[6]

Ford recognized unions in 1944 after pressure from the government, the Trades Union Congress - TUC - and local strikes. In 1946 the company signed its first Procedure Agreement establishing the structure of collective bargaining. Over 20 unions were recognized to represent Ford workers at that time. Amalgamations and other trade union restructuring caused this number to diminish over time.

---

[6] Turner, 1967, p.193.

Unions in Britain usually recruit across a wide range of industries and occupations and their internal structure vary. The two most important unions for the hourly paid in Ford in terms of membership are the Transport and General Workers Union (TGWU) and the Amalgamated Union of Engineering Workers (AUEW), representing in 1986 about 68% and 8.5% of employees respectively. The General and Municipal Workers Union (GMWU) represents another 3.5%, and the remaining 20% of employees are split between another 8 unions.

The TGWU, which is the largest union in the TUC, has a basic structure of a vertical division into 11 trade groups. Each of these groups is based on branches corresponding to a geographical region. District officials are full time union representatives at the branch level, nominated by the national officials, who are representatives of the trade groups. In Dagenham the TGWU has 4 branches. Besides the full time district officials, a branch secretary is elected directly by the shopfloor workers in each branch every two years. The branch Secretary is allowed to take time off for his union activities but otherwise works full time for the company.

The internal organization of the AUEW is very different. It has 4 sections: engineering, foundry, construction and white collar workers. Each section has considerable local autonomy. The engineering section, which particularly has a strong tradition of shop steward involvement, represents craft members in maintenance, toolroom and other skilled jobs. Full time positions are filled by direct elections. The AUEW has 2 branches in Dagenham.

Each of the other unions have distinctive structures.[7] At Dagenham they usually operate in conjunction with each other, particularly through the Joint Shop Stewards Committee. In Ford the Joint Works Committees (JWC) is a joint body with management and employee representation. However, the employee side of the JWC functions effectively as the plant level shop stewards committee and links the top union leadership, concerned with national level bargaining with the workplace. In the case of Ford JWC, members participate in the National Joint Negotiating Committee (NJNC), the main national level bargaining institution.

In all the other car companies except Ford, workplace bargaining was the general pattern of negotiations until the early 1970s. Agreements at national level, involving all plants of the same company, came to be generalized only after the abolition of piecework payment systems that occurred in the mid 1960s and early 1970s. Union sectionalism, the focus of bargaining and union bargaining structures were all related to specific payment systems. Conversely, fragmented workplace bargaining also required particular management systems.

At Ford the industrial relations system was different. Since its first 'Procedure Agreement' Ford has required equal representation of all the unions in the central negotiating body. The company agreed to representation on a craft, departmental or geographical basis as the norm, with a steward representing all union members in a section regardless of the union to which they were affiliated. In this way, Ford's representative system has been more

---

[7] The internal structures of unions in Britain are under continuous change. Changes up to 1980 are analyzed by Undy et al, 1981. See also Taylor, 1978.

dissociated from national union structure than in the other car companies. Ford has avoided accepting a steward for each union in each area.

Beyond the plant and, sometimes, beyond the company level, further coordination of worker representation has been achieved through Combine Committees which have been organized in the car industry since the mid 1950s. At times Combine Committees have had quasi-official recognition in developing industrial relations policies, but they are not part of the official union structures.[8]

In most cases job controls are based on the existence of closed shops, or one hundred per cent union membership. In this case, the employer agrees that a condition of employment is joining an appropriate trade union. The closed shop can both maintain the strong position of the union within the company, and, at other times, ensure the discipline of the workforce. In the latter case closed shops are viewed as adjuncts to personnel management because they can make employee relations more predictable. This may have been an aim of Ford management in 1971 when Ford became a closed shop. The clause came as a concession from management rather than as a result of workers pressures, during a period when management was seeking to avoid confrontation and establish increased interaction with unions on the shopfloor.

Pay systems

Due to the variety of internal organizational structures and employment conditions, wage systems and workplace

---

[8] For a view of the Ford Combine Committee's politics, see its publication Fraud News.

control varied markedly between companies until the 1970s.

The most common form of remuneration up to 1970 was piecework. Ford was an exception as it has always had a time-based wage system. In 1956 Vauxhall (General Motors subsidiary) also implemented a time-based wage, and in the mid 1960s the Midland's producers started to change to measured day work (MDW).

By the early 1970s the car producers based in the Midlands had changed their payment systems. Rootes was the first to decide to break with piecework in 1966 turning to MDW. In 1967 Chrysler took over Rootes and consolidated the change. British Leyland had different grade structures, all based on piecework system.

At different times, piecework bargaining was dominated first by a strong management authority and then by a strong workplace organization. Management used piecework to delegate to the workforce the responsibility for the organization of production and controlled the pace of work and earnings by the payment system.

Tolliday's account of shopfloor bargaining in Coventry,[9] where many of the British car companies were based, shows that union control over manning levels allowed workers to boost earnings in periods of expansion (by keeping down manning) and to resist the reduction of employment levels in recession. As a consequence of this sort of workplace control, shop stewards also took on 'quasi-managerial functions' in order to satisfy workers' demands and needs on issues as varied as job security, earnings, welfare arrangements, and grievance settlement. Although at first

---

[9] These accounts rely heavily on Tolliday, 1986b.

the change from piecework to MDW made worker organization stronger, it soon broke up shopsteward control over manning and production levels.

These sorts of controls depended on the abilities of groups of workers to influence work methods and retain traditional working rules (often derogatively labelled 'restrictive' practices). Their basis was the preservation of a division of labour which preserved the skills of certain groups through demarcation and controls over the hiring and firing of labour via regulating the amount of overtime and manning levels.

The impact of piecework payment systems on collective bargaining in Britain was to disperse wage structures and produce negotiating bodies which were shopfloor oriented and which lacked direct union coordination.

At Ford wage rates have always been time-based, fixed at the national level and applied to all Ford plants uniformly. Writing in 1967 Turner (et al) pointed out that stewards in Ford had a more limited role than in other car companies because they were not allowed to negotiate either on wage rates or workloads, which was a common matter of negotiation for stewards in all piecework companies. Ford stewards' activities were confined to individual and small group grievances, though they could, in some cases, influence the establishment of work standards on the basis of custom and practice arising from their direct relationship with low-level supervision. These practices imposed certain constraints on shopfloor management at Ford.

When in the late 1960s and early 1970s, management of the

domestically owned manufacturers sought to 'regain control' over labour, the strategy they followed was to adopt Ford's payment system based on MDW. This strategy provoked many conflicts because of the way the reforms were introduced and the consequent undermining of traditional bases of workplace power. The process of change in industrial relations procedures was accelerated in the late 1970s by the introduction of new technology, threats of plant closure, and rising national unemployment levels.

Collective bargaining

In the British industrial relations system, most of the issues in collective bargaining have concerned the shopfloor level. Unions have coordinated these activities by briefing stewards on broad policies for workplace negotiations and by training them, for instance in work study methods. Usually, as part of the structure of worker representation and collective bargaining, shop stewards are coordinated by a convenor at plant level and, by a group of conveners at company level.

In Ford collective bargaining has always been centralized. Payment has been based on grades and hourly-rates, and these and other working conditions have been negotiated by national officials. Apart from the conveners, shop stewards only participate at the beginning of the process leading to the drawing up of the pay claim. Ideally, shop stewards have discussions with workers to gather together matters to be taken to 'the Coventry Conference', where stewards from all plants meet with conveners and trade union officials in order to prepare the pay claim. However, shop stewards are excluded from the actual negotiations with the company.

Ford's pattern of collective bargaining was similar to that

of Vauxhall (General Motors' subsidiary) once the latter moved to a MDW system, but very different from the other British indigeneous producers. British firms had extremely fragmented collective bargaining structure based on local negotiations between stewards and managers, with almost no central coordination either by top management or top union executives.

The historical development of the British system of industrial relations show that both systems - 'Fordist centralization' and 'British fragmentation' - were the result of the interaction of structures of union organization, structures of wage systems and managerial strategies. Changes at Ford in Britain demonstrate that corporate decisions and managerial principles, originating in different contexts, are adapted and modified in different national situations. The voluntarist British system faciliated Ford's distinctive managerial strategy for labour relations because the company was free to diverge from the pattern. But by the late 1970s the other diverse systems of collective bargaining in other British firms were being pushed by management towards the Ford model. These shifts did not occur only for reasons internal to the companies. They were part of major trends in the British economy and politics in the 1980s and also responses to broader pressures of international competition.

2. Industrial relations strategies at Ford before the 1980s

The context of the voluntarist system of British labour relations has conditioned Ford's strategies, and in particular, facilitated the development of a strategy defined mainly by the patterns of the parent company.

The next four sections describe four main phases of industrial relations at Ford-Britain. The first phase was the 'fordization' of the pre-existing industrial relations system incorporated into the firm at the time of its acquisition of its major body supplier in the 1950s. The second phase was the implementation of a new strategy of accommodation with the unions following Ford's expansion to the Halewood plant on Merseyside. The third phase centred on the changes in industrial relations that followed the creation of Ford of Europe. These changes provide a focus for a discussion of Ford's policies to improve productivity, and of the convergence of Ford's competitors towards similar systems of pay and collective bargaining. The fourth phase involves Ford's labour relations reforms in the 1980s and the context of technological change and state policies. The section also considers the role of labour relations in British economic performance, a debate that has involved both industrial relations changes in the car industry and government policies.

The clash of two systems: pay and workplace control

A major event in the history of Ford's negotiations over employment conditions occurred in 1953 when the company took over the Briggs body plant, an American subsidiary that produced van and car bodies for the Ford assembly plant, situated on an adjacent site at the Dagenham estate. Briggs had a piecework system of remuneration and a strong shopfloor organization. The amalgamation brought up problems of compatibility and standardization of employment conditions. Wage levels, grading and workload controversies made management's attempts to control an organized shopfloor, a battlefield.

Many stoppages and sackings occurred until 1958, when a new 'standardization agreement' was signed bringing the old Briggs system under Ford's existing rules. The successful settlement of these disputes depended on the support of the Court of Inquiry (the Cameron Inquiry of 1957) that was established to consider Ford's industrial relations. The Inquiry reinforced the company's determination to control the work process and limit the stewards functions.[10]

The process of negotiations of the standardization agreement also showed that unions and stewards took different positions on workplace control. The shopstewards believed that the union officials were supporting management in order to undermine their workplace organization.

District officials, who are the union appointed representatives at local level, and shopstewards, the workplace ellected representatives, continued to dispute over shopfloor control, until a major conflict in 1962/3 on the issue of production speed up resulted in 17 leading shopstewards being dismissed.

A new public Court of Inquiry (the Jack Inquiry) was held

---

[10] See Beynon, 1984, p.61. The clause entitled 'The achievement of Efficiency in Operations' was introduced into the Conditions of Employment Agreement (clause 33) in 1958 and still exists in 1986. It reads: 'The Trade Unions and the Company agree on the need: (i) to achieve efficient production by all reasonable means; (ii) for the introduction of labour-saving machines and methods; (iii) for the Company to transfer Employees from one job or department to another as may be desirable having in mind continuity of employment and flow of production. It is not part of the duty of any Shop Steward whose constitution and duties are defined in the Procedure Agreement to deal with such matters in the Shop, but he may refer them for consideration by the Joint Works Committee'.

in 1963, in which the company's employment policies were supported and its views on the dangers of shopfloor organization existing outside of the union's official control endorsed.[11]

The events of these industrial disputes and the relative passivity of the national union officials, strengthened management acceptance of a role for union officials in discussions about employment conditions at the plant level.

These disputes did not spread beyond Ford and the rulings of the Courts of Enquiry were restricted to Ford. Neither party wished it to be otherwise. However, in the 1970s both Ford's pay system and the relations between unions and shopfloor representatives became a model for the domestic car producers. By that time Ford had experienced many industrial relations disputes and had changed its approach towards closer cooperation with shopfloor representatives. Many of the issues which affected Ford plants were to be shared by car workers in other companies.

Dagenham and Halewood: different industrial relations strategies

In 1963 Ford split car production in the U.K. between Dagenham and a new estate in Halewood, Liverpool. According to Beynon (1984) Ford's plans to build up new manufacturing facilities at Halewood were developed in the late 1950's, greatly influenced by the company's determination to make use of the available 'green labour'. Ford wanted to avoid labour conflicts by careful recruitment policies, and sending management who had had experience in dealing with shopstewards conflicts at Dagenham to run the new site.

---

[11] Beynon, 1984, p.69.

Part of Ford's shopfloor control policy at Halewood initially was to seek agreement with the 'right wing anti-shopsteward leadership' unions AUEW and GMWU on union representation.[12] The TGWU objected against its exclusion and pressed for recognition of its negotiating rights using their strong labour organization in the Liverpool docks, through which they controlled the shipment of cars. After this dispute all 3 major unions have had representation rights at Halewood, the highest membership being with the TGWU.

Despite Ford's careful plans to control shop steward activity, by 1968 they had had to grant facilities to shop stewards and conveners in order to achieve 'a new constructive relationship'. Many strikes had broken out in the previous years. Halewood militancy became a pace-setter for shopfloor organization all over Britain. It also became the central management problem for Ford, particularly until the early 1980's.

Beynon's explanation of Halewood's high levels of militancy[13] stresses both the existence of fewer unions representing the workforce and the development of a new approach to shop stewards by drawing the lessons of their defeat in the 1962/3 events at Dagenham. Dagenham's multiplicity of unions had led to the establishment of a steward organization isolated from the official hierarchy of the unions. This had weakened the shop stewards in 1963. In Halewood Ford sought to avoid the development of a strong shopfloor organization by recognizing fewer unions. But, in the light of the Dagenham experience, Halewood shop

---

[12] Beynon, 1984, p. 76.

[13] Beynon, 1984, Ch.8.

stewards recognized the need to exert influence within the unions and developed a consistent policy at plant and branch levels. They also understood that their chances of success depended on developing sustained support from the shopfloor through continuous organization.

Halewood workers organized joint action with Dagenham workers in many crucial industrial disputes. In the early 1980's they were pushing ahead in resisting the implementation of new working practices following the introduction of new technology.

Integration of Ford of Europe and imitation of the Ford system by other British producers.

The creation of Ford of Europe in 1967 demanded new management strategies from the national companies. Increased concern to improve productivity levels led to the implementation of new industrial relations strategies. The first new agreement to be signed, the 1967 two-year Agreement, established a new standard duration for wage settlements. Further economic claims were not expected within the duration of the contract. It settled the pattern of wage strikes and became a prototype for future Agreements. Moreover, the wage structure introduced procedures of job-evaluation that were current in the United States.[14] This rationalization of labour management had important implications for shopfloor control.

In Ford-Britain, reforms implied difficult negotiations for the withdrawal of established working practices based on

---

[14] American consultants from 'Urwick, Orr and Partners' developed the project for FMC in Dearborn and assisted in its application. See Ford-Britain, Documents on the 1967 Job Structure.

custom and practice. Changes in the wage structure were at the centre of the new industrial relations policies.

A new wage structure, based on an extensive job evaluation programme was introduced in 1967. A new 5-grade wage structure replaced the old 3-grade one and was accompanied by a new clause concerning productivity improvements. Efficiency was to be achieved through flexible operation.[15]

Within a new approach which stressed closer cooperation, the job evaluation programme was discussed by a committee involving union representatives, shop stewards and management. However, the implementation of the new agreement created great discontent amongst particular occupational groups, especially discontent with their grading, during 1968.[16] Shopfloor refusal to accept the agreement damaged trade union authority in the central negotiating body - the NJNC. Eventually, these disputes caused the setting up of a new public court of Inquiry (the Scamp Inquiry of 1968).

The Inquiry was addressed to technical details about the

---

[15] In the negotiations for the 1967 Two Year Agreement, the NJNC agreed that 'the responsibility for increasing productivity rests primarily with management. However, productivity also depends on Employees working efficiently - which means full personal effort, based on the best use of employees' experience' (Supplement to Agreement, in Friedman and Meredeen, 1980, p.238).

[16] The Sewing Machinists strike involving Dagenham and Halewood became a major national case related to equal pay and lasted over 6 months in 1968. Other discontented groups who walked out were carpenters and joiners in Dagenham, and foremen in Halewood. For a detailed account of these industrial disputes see: Friedman and Meredeen, 1980; and Beynon, 1984.

job evaluation programme, such as ranking techniques, the disclosure of weighting factors and the definition of job characteristics. As the Inquiry went on, the depth of divisions between the different unions, as well as between the unions and their shopfloor members, became public. Issues of shopfloor democracy and of internal union democracy were raised. Authoritarian union officials supported the company in its desire to contain and subdue the rank and file movement. Ford was concerned with restoring the authority of the NJNC that had proved unable to deliver effective agreement for the introduction of changes in the job and wage structure.

Ford saw the central issue as the power of management and the right to manage on the shopfloor. The ability of unions to control their members on the shopfloor seemed weak to management, and without this management were finding it increasingly difficult to deal with the shop stewards' organization. In the late 1960s, Ford urged the government to curb trade union power through an increasing formalization of the collective bargaining system.

In 1968 the Donovan Commission Report was published, in the middle of Ford's crisis. The establishment of the Commission had been greatly influenced by the high rate of strike activity in the car industry, and it based its main conclusions on the industry. The Report described the British system of industrial relations as fraught with problems due to 'the disorder in factory and workshop relations and pay structures promoted by conflict between the formal and informal system of collective bargaining'.[17]

---

[17] For an account of the influence of the Donovan Commission on Industrial Relations management in the car industry see Friedman and Meredeen, 1980 ,and Marsden et al, 1985, p.92.

For Ford the problem was not one of formalizing collective bargaining so much as to have its system legitimized by workers consent to its formal negotiating procedures. A tentative approach towards increased consensus had been the invitation to shopstewards to participate in the job evaluation programme and productivity bargaining. But management had ended up imposing the new wage structure, resulting in the eruption of numerous conflicts.

Ford's next move towards improving labour relations and increasing productivity was to offer a deal in which income was linked to 'constitutional behaviour' through incentives. At the shopfloor level this proposal was rejected on the grounds that it implied the application of 'penalty clauses'. But in the NJNC Ford's incentive proposal won a majority vote. In the light of this lack of consensus the company held a ballot and the agreement was rejected. The NJNC's agreement was made worthless and the authority of the NJNC was critically undermined. Ford decided to go to law to attempt to legally enforce the collective agreement signed by the NJNC in order to mandate the workers to accept the negotiated settlement. The legal action failed eroding even further the authority of the NJNC.[18]

The official system of worker representation could no longer guarantee acceptance of agreements by the shopfloor. Wisely, Ford proposed to change the national representation system and instead of the former one vote per site, proportional representation was adopted on the basis of one vote per plant. For example, previously the Dagenham site (with 34% of Ford's employees) had had only one vote, the

---

[18] See Friedman and Meredeen, 1980, p. 227.

same, for example, as Bridgend with 3% of the employees. Following the reform, Dagenham had five votes and Bridgend continued to have one. This made the system more democratic, although some complain the present structure should consider representation in accordance to the number of workers.[19]

The 1969 crisis over the imposition of individual penalties for unconstitutional behaviour was eventually resolved by its replacement with collective penalties. These affected the holiday bonuses of all the workers in the plant in which an unconstitutional strike arises. As part of this agreement the unions also gave notice of their intent to pursue parity of earnings with car workers on piecework systems in the Midlands car firms. Ford's earnings levels, which had been lower since the 1930s, had fallen far behind those of the British-owned firms. Parity would soon become a major issue.

The publication of the White Paper [20] 'In Place of Strife' by the Labour government in 1969, provided further proposals for more centralized collective bargainings. It presented a call for the legal enforcement of collective agreements along the lines that Ford had earlier sought.[21] The Paper recommended that the secretary of State for Employment should have the power to require unions to

---

[19] On the company's position in relation to the adoption of proportional representation on the trade union side of the NJNC in 1969, see Meredeen in Friedman and Meredeen, 1980, pp. 228-9. He regards this move as resulting from the 'more liberally minded managers's approach to meet 'the challenge from below'.

[20] In British politics a White Paper is a detailed outline of proposed legislation issued by the government.

[21] Tolliday, 1985

ballot their members before calling strikes that he considered to be a threat to national interest. These proposals turned out to be embryonic of the industrial relation laws introduced one decade latter.

The themes of 'In Place of Strife' reflected old concerns of employers to break collective action and restrain wage claims. The Paper intended to make unions responsible for controlling unofficial strikes by disciplining their members. These sorts of legal enforcements of more centralized collective bargainings made little headway. Instead changes in bargaining structures towards more centralized and coordinated procedures were to come only as a consequence of the consolidation of measured day work systems of payment.

The extent to which payment systems in the industry would converge was still unclear in the early 1970s. Workers sought improved and more generalized piecework systems. Management pursued increased institutionalization of MDW systems. In the Midlands, the car firms were converting pay systems into MDW from 1966. This was a slow and delicate process revealing a great deal about workplace control and its conflicts.[22] At Ford, the 1971 pay claim raised questions about workplace control in terms of wage levels, but not in terms of the payment system itself.

Ford workers considered the wage system particularly unfair because workload variations were not taken into account. The company refused to implement parity with Midlands wage levels, causing a 10 week strike in 1971, in which all its U.K. plants were involved. The ensuing negotiations were

---

[22] A very good description of the process of transition to MDW in its late stages at British Leyland is presented by Willman and Winch, 1985.

the first to be held by the newly enlarged and restructured trade union side of the NJNC on which five plant conveners now sat alongside the national union officials for the first time. For both the company and the trade unions it was important to protect the authority of the trade union officials in the new structure and Ford offered a major wage increase.

Ford's new industrial relations approach following the formation of Ford of Europe coincided with claims from other British producers for more formalization of collective bargaining. Both approaches aimed to legitimize more central coordination of collective bargaining. For British producers the core was the pay system, for Ford it was the recognition of the authority of the NJNC.

Ford's role in the convergence of pay systems in Britain came from the adoption of its payment system as a model by other companies, but, also and more importantly, from its firm stand to restore central union control against shopfloor claims to control workloads in 1971. Management in the Midlands were at pains to take this sort of control from stewards and looked at the MDW system as a means to achieve this.

During the 1970's Ford widened the scope of collective bargaining transforming further its system of industrial relations. Manning and work standards became a matter of negotiation in 1975. Joint Working Committees were established throughout the decade to discuss new ways to improve industrial relations. In 1975 the shop stewards were granted greater autonomy so that most problems related specifically to the shopfloor could be resolved at plant level without the need to refer to the NJNC for resolution. For the unions the trade-off for this greater workplace

control was the compromise of agreeing not to go on strike until all the steps to resolve grievance issues - as set out in the Procedure Agreement - had been exhausted.

Conflicts and the procedures to deal with them became more intitutionalized. Big profits during the 1970s assured peaceful labour relations. Wage increases were able to buy off discontent. However, Ford's economic performance differed from that of the other car producers in Britain. Ford was able to make profits at a time when its competitors' economic performance was poor. Both Chrysler and British Leyland made big losses in the mid 1970s. New approaches to industrial relations in the British car industry began to be formulated in the late 1970s. They counted on government support, particularly for the recovery of management's 'right to manage' at British Leyland. More broadly, at national level, the newly elected Conservative government was commited to control the trade unions by law.[23]

The government and labour management in the car industry

It was management's belief in the mid 1970s, that in order to improve the economic performance of the British car industry three major problems had to be solved: constant interruptions of production by labour stoppages, the reluctance of workers to accept new methods of working and equipment, and managerial toleration of sub-standard

---

[23] The Conservative Industrial Relations Act 1971 had turned the recommendations of the Labour government's White Paper 'In place of Strife' into a real power of the state, requiring ballots when strikes threatened national economic, defence or public order interests, and when the state believed unions were not acting according to workers' wishes. In 1984 the ballot requirement was extended to all strikes.

quality. These problems were thought to be at the root of poor labour productivity because their direct consequence was overmanning, poor resource utilization and lack of capital investment.

These factors were stressed, for instance, in the conclusions of the Central Policy Review Staff (CPRS), a committee set up by the government in 1975 to study the problems of the motor industry. Within this framework labour productivity was seen to depend crucially on workers willingness to accept new manning levels and working practices.[24]

Arguments about the 'inappropriateness' of the British system of industrial relations for competitiveness have been widespread among politicians (mainly Conservative) and management. In the academic literature it has provoked a debate in which there is consensus that labour relations needed to be changed but disagreement about labour responsibility for British economic decline.[25] Both groups agree that labour relations problems are related to the structure of the industrial relations system. Management is as responsible as labour for the failures of the system. The most dissonant view in academic research is presented by Williams et al: 1983 and 1987, based on the case study of B.L./Austin Rover. They argue that BL management placed

---

[24] CPRS, 1975; for a critique of the CPRS methodology, see Nichols, 1986.

[25] Three official enquiries set up in 1975 to search for reasons for the decline of the British car industry - House of Commons Expenditure Committee, Central Policy Review Staff, and Ryder Report - pointed to underinvestment and bad work practices as the major problems. The role of labour for economic decline/recovery is discussed in Jones and Prais, 1978; Williams et al, 1983 and 1987; Marsden et al, 1985; Willman and Winch, 1985; Willman 1986; and Altshuler,1985.

excessive stress on the workforce as the major obstacle to high levels of capital utilization on new equipment. They attribute BL's failure to inappropriate managerial strategies, which neglected constraints in the market-place, outside the factory. These remained when the workforce had been adjusted to the 'new production needs'.

The new approaches to solving labour problems have been full of contradictions. Increasing employee involvement and participation have been sought at the same time as confrontation and imposition of reforms have been carried out by management. On many occasions confrontation has been used as a strategy to achieve 'cooperation'. Sometimes it has achieved a certain success, such as at British Leyland. Other times it has delayed the implementation of participative schemes, such as at Ford Halewood. Nonetheless, based on the Japanese model, cooperation from labour has been seen as the best formula for increasing competitiveness.[26]

By the mid 1970s Ford-Britain had already taken significant steps towards employee participation in shopfloor matters, such as formalized procedures for consultation over new working practices. New industrial relations policies had been developed increasing the authority of plant management, and seeking to have decisions taken at a lower level in the hierarchy. This pattern worked quite well up to the late 1970s.

At both Ford and BL in the late 1970s, management strategy became increasingly bound up with changes in government policies, particularly in relation to income restraint and trade union legislation.

---

[26] See eg: Streeck, 1985a; Katz and Sabel, 1985.

In 1978 a voluntary incomes policy was introduced by the Labour government recommending 5% increases in earnings, with the possibility of further increases being self-financed by productivity schemes. Ford workers demanded a 25% wage increase and reduction in the working week to 35 hours. Ford initially took a hard line backed by the government's pay guideline recommendation. After a 9 week strike, however, the company increased its offer to 17% together with a new 'Attendance Payment Plan', by which a weekly supplement was to be granted to workers who worked normally for all his/her standard weekly hours.[27] The wage offer was accepted and as a result Ford was subjected to government penalties. At the same time, the breaking of the government's 5% guideline by the company and the unions seriously weakened the Labour Party's authority in industrial relations issues.[28]

By the late 1970s industrial relations were persistently pointed to as the major obstacle to the improvement of British economic performance. Consensus about state interference to curb workers' powers was substantial. At the time of the 1979 general elections, political campaigns placed trade unions at the centre of political arguments. The Conservative political campaign emphasized the need to change trade union legislation by tackling its current unrepresentativeness. It asserted that industrial decline could be stopped by a new reassertion of management

---

[27] Through the 'Attendance Payment Plan' Ford, in effect, reintroduced the penalty clauses the unions had rejected in 1969. 'Unconstitutional behaviour' could once again result in monetary penalties for individuals.

[28] Undy and Martin, 1984, stress the importance of Ford events for the Conservative reforms of industrial relations that followed.

control.

At British Leyland a 'Participation scheme' had been introduced at the behest of the Labour Government following the Ryder Report in 1975. It was an effort to give management a new legitimacy in seeking improvements in performance. Greater support from the workforce was crucial. The scheme was set up in parallel to normal collective bargaining procedures. It was directed primarily to achieve changes in organization to accompany the production of the new 'Metro' model but it broke down with the emergence of the new management hard-line after 1979 under the influence of the Thatcher government.

Reassertion of management control at British Leyland was achieved through tough measures designed to show both the workforce and the government that the company was prepared to close down rather than capitulate to opposition to the implementation of new working practices. A central aim of the changes at this company was to bring union national officials to the forefront, reducing the influence of the stewards and local full-time officials.[29] In addition, British Leyland's recovery also implied the acceptance of great job losses by the workforce.

Both the Confederation of British Industries (CBI) and the government saw the basic problem as to weaken the power of the unions in relation to employers, but to maintain the authority of union officials to keep union members 'in line'. The CBI in particular complained about the decline in the power of the official, 'the most stable element in a union's dealing with management'. They considered it 'dangerous' that so many decisions had 'to be made by the

---

[29] Marsden et al, 1985, p.150.

rank-and-file'.[30]

In 1978 the CBI had set out an agenda for industrial relations reform. It called for legislation on picketing, the closed shop and finance for strikers' families. The Conservative Party from 1979 supported and went beyond these demands. Their industrial relations policies were based on: 1. restrictions on picketing, 2. provision of the right to appeal to the courts for members expelled from their unions, with compensation for loss of jobs if dismissed as a result, 3. provision of public funds for secret ballot to encourage wider participation by union members. These changes have been carried through, despite resistance by the TUC, assisted by increasing levels of unemployment, both at the national level and, in particular, in the car industry.[31]

Thus, industrial relations in the car industry in the early 1980s presents a decline in the bargaining power of the shopfloor and a reassertion of control by union officials. At the same time, there has been a transformation of the management styles of the companies, modernization of production and the introduction of new technology. At the general level the political climate has changed sharply against the unions, particularly in the context of economic recession, unemployment and fierce international competition.

These new conditions are related to the implementation of change at Ford and at Dagenham in particular. Although my

---

[30] Quoted from CBI, 1980.

[31] For a discussion of the role of CBI and TUC in the Conservative industrial relations reforms see Undy and Martin, 1984.

main concern is with the Dagenham site, developments involving Halewood and the Austin Rover plants will also be considered next, both because Dagenham management learnt from these other experiences, and because Ford's industrial relations policies are applied at the national company level. Sometimes Ford's broader national changes in labour relations strategies have stemmed from events in particular plants. This seems to have been the case with policies to implement new working practices that accompanied the introduction of new technology at Halewood. A further benefit from the inclusion of Halewood in this analysis is the wider scope it provides for comparisons with the Brazilian case.

3. Lessons from Halewood and Austin Rover (BL)

New technology was introduced in the United Kingdom later than in other European car manufacturing sites. The first plant to automate extensively was British Leyland in 1979 for the production of the Metro at its Longbridge plant.[32]

Ford started to introduce new technology in its Halewood plant in mid 1980.[33] It was selected as the assembly

---

[32] Marsden et al (1985) state that automated welding first appeared on a large scale in the U.K. in 1976 on the Ford Fiesta line. However, my fieldwork at Dagenham indicates that automation was first introduced in body assembly in 1982 for Sierra production. The Fiesta introduction did not, in fact, substantially change the production process at Dagenham.

[33] 39 robots were installed at Halewood's Body Plant for underbody and body side assembly. The traditional underbody assembly process which used to use 48 workers now used 7 and these 7 workers became 'loaders instead of welders'. In the paint shop there was a 'dramatic' reduction in the numbers of men employed in the spray booths. Trim and final assembly jobs

location for the 'new Escort' in Britain, and was linked to plans for a general change in the production process. In its 1978 Procedure Agreement Ford had obtained the full cooperation of the trade unions at national level for the implementation of such changes. At that time Halewood was considered 'the least productive plant in Europe', 'the most troublesome' and also 'the Escort plant where workers were paid the lowest wages'. It was expected that the introduction of new technology would bring a new degree of control of labour and an intensification of work and would provide the basis for a general reform of industrial relations.[34]

These changes were part of Ford's broader 'After Japan' programme launched in 1980. The renewal of production systems was to be part of a new pattern of integration of subsidiaries across Europe and productivity and costs would be compared on a wider basis.

When Halewood workers came back from the summer shutdown, in September 1980, they started working on the new car which was sent down the line mixed with the 'old Escort' model. A period of 'turbulent' industrial disputes followed, accompanied by management threats to shut down the plant if productivity did not improve.

The main disputes arose over changes in the production process. New demands from workers concerned new machines, new lay out, unfamiliar jobs, safety hazards, lack of time to adjust to new tasks, additional tasks, higher targets, change in job allocations, manning levels, and redundancies

---

were the least affected. (Beynon, 1984).

[34] On these lines of argument see Beynon, 1984, p. 353.

for foremen. The issues raised by management were productivity improvements, prevention of stoppages, and cooperation. Management's practices were to discipline workers by means of suspensions, lay-offs and dismissals.[35]

To prevent disruptions in production Ford issued a New Disciplinary Code on 5th November 1980, which was to be applied to all of its plants in Britain, whereby 'non-cooperative' workers could be laid off, suspended or dismissed.[36] The fight by Ford workers for the withdrawal of the Code was restricted to Halewood, although the Code related to all Ford plants in the U.K.. This sort of plant based struggle has been a recurrent feature of British trade unionism. Both Halewood's alleged high levels of militancy and its experience of major changes in the production process in the preceding years may have influenced events there.

The unilateral introduction of the New Disciplinary Code coming soon after major changes in the production process at Halewood seems to have been a policy linked to technical change. This echoes the findings by Willman and Winch in their study of British Leyland.[37] They found a close relationship between management's choice of particular

---

[35] I am grateful to Dr. Steven Tolliday for having allowed me to use his archival material on the industrial disputes at Halewood.

[36] The new discipline policy was soon applied to 370 Halewood workers who were suspended for not having followed the new rule that 'workers may not rotate jobs with each other unless they first meet output targets on their current jobs. The next day there were 2,500 further lay-offs. The union argued that the industrial dispute was caused by workers' unfamiliarity with the new jobs, safety hazards and the company's unwillingness to allow time for people to adjust ('The Times', 28/11/1980).

[37] Willman and Winch, 1985, p.100.

forms of automation and their demands for discipline to ensure continuous working during the process of negotiation of 'The Management of Change' and the 'Blue Newspaper' (the key documents outlining management's new strategy at BL) in 1980, which occurred just before these events at Ford.

The shop stewards at BL had fought unsuccessfully against their management's Recovery Plan in 1979/80. Management showed total firmness in the implementation of change and exposed a lack of employee support for the stewards. The shedding of approximately 25,000 jobs was planned as part of the programme of rationalization in an attempt to solve British Leyland's economic difficulties.

In contrast to the results at British Leyland, Ford had to withdraw the Discipline Code by the end of May 1981.[38] In return the unions committed themselves to end unofficial strikes through the use of their internal discipline procedures.[39]

The introduction of a new efficiency programme was the main claim by Ford management at the November 1981 pay claim

---

[38] Further lay-offs followed a disciplinary suspension caused by the refusal of 8 men to take on 'a minor additional task' ('The Times', 12/01/1981). Two stoppages occurred within 48 hours as a result of deployment disputes and led to 5,000 workers being involved in a sympathy stoppage ('The Times', 27/02/1981). A walkout over manning on the Escort resulted in 3,500 lay-offs on the 4th of March. A week later 400 foremen walked out for a day after a threat of redundancies. Refusal to accept higher targets provoked the suspension of 4 workers and a mass meeting of 10,000 voted to strike ('The Times', 12/05/1981).

[39] Early in June trade unions sent a letter to all Ford employees urging strict observance of procedures to avoid unofficial stoppages. The company considered that such assurance went further than previous ones.

negotiations. Strikes were threatened but finally called off.

The employee side of the National Joint Negotiating Committee - NJNC, claimed a wage increase of 30% and a reduction in the working week to 38 hours in the 1981 pay negotiations. The company offered a 4.5% wage increase and insisted that this should be linked to wide-ranging efficiency proposals. The trade union argued that any productivity proposals should be negotiated independently of the annual wage talks and threatened a strike. The strike was called off at the last moment because the company offered to improve its offer to 7.4% and to reduce working hours to 39 from January 1983 in return for productivity concessions. Mass meetings were held to vote on the deal and the majority of Ford's plants voted to strike, including practically all the workers at Halewood and Dagenham. But the employees were split with the white-collar members voting to accept the deal. The company was said to be prepared to sit out a strike if necessary. The Advisory, Conciliation and Arbitration Service - ACAS - held informal talks and succeded in having the strike threat removed after concessions by the company on pensions. The NJNC voted to accept the deal and their recommendation was accepted in the majority of the plants. In Dagenham acceptance was by a narrow majority. In Halewood and Swansea it was rejected but a two day strike at these plants did not change the agreement.

Ford's strategy towards the introduction of new technology at Halewood seems to have been planned in the shadow of British Leyland's earlier experience of 'packaging' technical change and discipline control. Either because each company faced different economic pressures or because their management styles differed, or because Halewood shop stewards learnt from the failures at BL, the outcome was

that Ford failed to retain its new Disciplinary Code.

The occurrences at Halewood probably affected the company's strategy at Dagenham where there was more consultation and earlier worker involvement in the process of technical change happened. Changes in working practices were implemented over a longer time with more forceful approaches only coming in 1985.

4. Consultation on controlled and slow changes

In late 1981, the unions were informed of the manpower and skill requirements for Sierra body construction at Dagenham within the new automation plans. The first robots were brought into the plant and workers were taken to visit the Escort facilities at Halewood. The Halewood production processes were less modern than the ones now being introduced at Dagenham.

During 1981 the renewal of the Paint shop at Dagenham began but the changes implemented did not have a great impact. Further renovations in paint were introduced gradually until 1984.

Around April 1982 Dagenham body shop lay out was changed. Robots were first installed in the finish welding area (respot line), the first to be put into operation. The engineers who installed them worked for some time alongside the welders whose jobs the robots were to replace completely.

The robots in this area all have female names such as Sarah, Helen, Judith etc. engraved on small metal plates attached to them, which correspond to the names of the

former machine-operators' wives. This was a management attempt to make the shopfloor workers more familiar with the robots.

Dagenham's bodyshop robot installation was done gradually. The last process to be automated was the body framing area, in January 1983. Work with the new equipment started by sending bodies of Cortinas (the model which preceded the Sierra) down the line to test the robots and give workers training.

During the 1982 summer shutdown, while normal jobs were stopped, the changeover took place. Manufacture of the new Sierra began when workers returned from their holidays, and the car was launched in October. At the same time production processes for the assembly of Fiesta bodies also changed, combining the use of both old and new equipment.

As described in Chapter 5, the major immediate changes in employment were the displacement of 400 production workers, who were redeployed to other areas, the majority to final assembly, and new arrangements for maintenance jobs. Here a problem was raised by the new equipment having been allocated by the unions amongst themselves. The company was expecting that electrical maintenance, on line programming and mechanical maintenance of the robots would be carried out by electricians. This would affect existing craft demarcation lines. But the unions involved, EETPU (Electrical Engineering Telecomunications and Plumbing Union) and AUEW (Amalgamated Union of Engineering Workers), insisted that electrical maintenance jobs and programming should be carried out by electricians, mechanical maintenance would be done by engineers , and engineering workers would also operate the robots if human labour was required in the operations.

The changes in employment at British Leyland, as described by Willman and Winch (1985), went much further. Firstly, there were large job cuts; secondly, work organization was based on the principle of team working and two-trades maintenance was introduced. Team working in this context meant that operations within a given production zone would be organized into a team, with few individual job demarcations, under a supervisor. Two-trades maintenance implied a reorganization of the four previously existing craft groups into two electrical and mechanical groups. 'On line' maintenance was to be introduced, reducing response times in production zones. These changes at British Leyland were strictly implemented.

At Ford, the bargaining process about similar issues involved more negotiation and took a longer time. The issue of demarcation at Ford, particularly for craft jobs, was a major factor inhibiting greater flexibility. This will only be changed after the implementation of the 1985 November Agreement.

For most of 1982 industrial relations in Ford's plants did not give rise to major grievances, except for three disputes at Halewood which had wider implications.[40]

The November 1982 negotiations went smoothly.[41] In 1983 the

---

[40] In March there was a 3 day strike in the Bodyshop because of dismissal of a worker for 'poor working record'. In April a 3 day strike by 300 occurred against 'new working practices'. In November 420 Paint shop men went on strike for 4 days after management cut the size of gangs from 5 to 4 workers on pre-paint ('The Times', 03/03, 27/04, 28/11/1982).

[41] Though, Halewood and Swansea did not accept the agreement recommended by the NJNC ('The Times', 18/11, 03/12/1982).

biggest industrial action to affect Ford occurred at Halewood around the 'Kelly case', which lasted from March to June. This provoked new moves by Ford to introduce new working practices.[42]

The issue of changing working practices has been recurrent and remains unresolved. Closer attention can clarify developments and help to explain the policies for actual changes in the working practices that were eventually negotiated at the national level in November 1985.

In the first few months of 1983 Ford announced 1,300 redundancies at Halewood and 3,000 at Dagenham. The need to close the 'productivity gap' with the West German Saarlouis plant was alleged to be crucial in order for the British plants 'to survive'.[43]

The new working practices Ford wanted to introduce in 1983 were basically the relaxation of job demarcation lines and the inclusion of more self maintenance in existing jobs. These changes, together with the announced job cuts aimed to bridge the 'Saarlouis gap'. The company claimed that under the current procedure agreement it was entitled to

---

[42] The issues involved in the 'Kelly dispute' were: 1. Kelly's dismissal was based on company allegations that 'an orgy of destruction was going on inside the plant', though the evidence of the foreman involved was that only 'a £ 0-86 bracket was circunstantially broken' ('The Times', 23/03/1983). 2. A strike by half of the workforce demanded Kelly's reinstatement. A public announcement by the company of its intentions to introduce new working practices led the TGWU to make the strike official. Eventually the worker was reinstated through ACAS arbitration ('The Times', 03/06/1983).

[43] The 1983 'productivity gap' figures are from 'The Times', 05/01 and 04/02/1983. For a discussion about the controversy over productivity indices see Chapter 5.

make the changes since the introduction of new practices had been accepted in the 1981 wage agreement.

However, following Halewood's resistance, management agreed to suspend the introduction of new working practices pending study by a joint working party. Again Halewood was the instigator of a postponement of management policies that would affect all Ford plants in the U.K.

In September 1983 it was announced that, by the end of the year, 102 robots would be installed at Halewood on the Escort and Orion lines, the latter a new model for the site. By that time automation in Dagenham was also complete throughout the Body Construction shop.

Dagenham's new car, the Sierra, was suffering a serious fall in sales. There were problems of design, performance, and market. The car body based on aerodynamic principles was unfamiliar and did not fit the taste of conservative fleet buyers who were almost half of Ford's customers. The old Cortina engine fitted in the Sierra made the model less attractive. Some Dagenham shop stewards stressed that this initial failure of the new model weakened their bargaining power. A top selling car would increase the unions' bargaining power.

The pay claim of November 1983 showed Ford's plants in the U.K. to be divided. The company's offer of 7.5% was twice the Government target but the NJNC nevertheless recommended rejection. The majority of the plants voted to accept. In Dagenham the Body and Engine plants voted to accept the deal but Paint, Trim and Final Assembly voted to reject. The unions accepted the offer on pay but rejected changes in working practices. No major industrial action was taken. Nevertheless, the need to close the productivity gap with

other European plants was continously claimed by the company. The performance and working practices of West German, Belgium and Japanese workers were the patterns to be achieved.

5. Lower levels of employment, flexibility, avoidance of disputes

In 1985 major proposals for increasing job flexibility were negotiated at Ford and have since been introduced. Job flexibility was to be achieved through a major change in wage and job structure. A more extended discussion of the content of these changes and their implicatiions for flexibility, quality and efficiency will be presented in Chapter 9. However, it is helpful to outline some of the issues here, in order to place them in the context of broader changes in industrial relations at company and industry levels.

The job evaluation scheme, that had been in use for the last 17 years, was replaced. Job titles were reduced from 483 to 58. The 5 wage grades remained, and two allowances were introduced: a Lineworkers allowance for the semi-skilled - over 80% of the hourly workforce on the site -, and a Productivity allowance for the skilled - almost 20% of the workforce - and unskilled labour. It was expected that it would take over two years for all the operational details of the new structure to be detailed and implemented. Each of these wage grades means that equal value has been attributed to the related job descriptions. The main criterion for the wage grade placement in the old structure had been similar work and similar performance. The new structure breaks with these two principles by means of group allowances and flexible deployment of labour.

The allowances are linked to continuing efficiency improvements, the abolition of the job evaluation system and its consequent 'Grading Grievances Procedure', and a major reduction of job titles. The agreement is designed to fit the requirements posed by the flexibility of the new technology. The unions agreement to this proposal was based on their hopes of safeguarding jobs and conditions.

On similar lines to Ford, British Leyland's 'Blue Newspaper' of April 1980 had introduced a new job evaluation scheme condensing the previous 500 or so classifications for hourly paid employees into 5 company-wide grades. An incentive scheme related to output was to be applied in all the plants. Shop stewards at plant level were excluded from negotiations on wages or incentives.[44]

The similarities of Ford and British Leyland strategies derive from the characteristics of the British system of industrial relations.

The system of employment in Britain developed on the lines of a division of labour adapted partly to production process requirements and partly to workplace organization founded on job demarcation. Job demarcations have remained a strong basis of workers' organization and job control and managers in Britain have been tied by them when attempting to introduce flexibility. Partly as a result, the negotiation of flexibility between management and shop stewards has been accompanied in some cases by drastic measures such as an enormous reduction in the workforce,

---

[44] Marsden et al, 1985 p.101.

new recruitment policies,[45] or the imposition of agreements.[46]

In 1980 Ford had 76,000 employees in the U.K. (57,423 hourly workers); by 1985 the number of employees was 30% lower, at 53,000, (hourly workers alone decreased 36%, down to 37,027).[47] This reduction in the number of employees was achieved through voluntary redundancy and early retirement schemes. During the same period new hirings still occurred, making the workforce reduction part of a major change in the employment structure of the company. Data for Dagenham demonstrate that 14.6% hourly workers in Stamping and Body Assembly and 15,9% hourly paid in Paint, Trim and Final Assembly were hired in the period from June 1980 to June 1985.[48]

Industrial Relations managers at Dagenham claim that there has been a great improvement in efficiency since 1980. 'Nowadays (Sep/1985) we have 35% less workers and produce the same number of cars as in 1980'. 'In 1980, the daily

---

[45] In order to facilitate economic recovery and the introduction of new working practices British Leyland decided to produce the Metro in 1979 at Longbridge using 'green labour', and aiming to avoid previous constraints. (Willman and Winch, 1985). Ford's decision to build a plant at Halewood was also supported by the existence of 'green labour' in the region. See Beynon, 1984.

[46] The 'Blue Newspaper' introduced at British Leyland has never been formally accepted by the unions. (Marsden et al, 1985, p. 31). Ford's new Disciplinary Code was also unilateraly introduced in 1981 but, as we have noted, it could not be applied because of worker resistance.

[47] Source: Ford-Britain, Manpower statistics; Annual Reports for 1985, Company Statement for the Annual Pay Claim.

[48] Hourly Statistics for Dagenham, year ending 11/06/85.

schedule, rarely achieved, was 800 cars; we faced an average of 280 industrial disputes per year. Now (Mar/1987) we produce 1,100 cars per day with 2/3 of the workforce and rarely miss the schedule'.[49]

In October 1986 the chairman of Ford UK announced new investment plans pointing out that they reflected a '... gesture of confidence by Ford in its British employees' ... '. He said that 'there was a new sense of partnership. We still have a long way to go to raise our performance to the standards in our Continental plants, but we have made a start.'.[50] This represents a sharp contrast with the Ford of Europe Vice President's message to the National Joint Negotiating Committee (NJNC) in February 1981 when he said 'We have to cut out demarcation, we have to improve manning flexibility, we have to do it right first time, we have to reduce manning levels. There is no alternative if we are to survive'.[51]

This latter message followed shortly after the 1979 agreement in which security of employment was stated to be a goal. How security of employment could be reconciled with great reductions in manning levels is a result of the high levels of voluntary redundancies which made it possible to avoid any compulsory redundancies during this period. The reduction in employment levels at Ford was not unique. From 1979 to 1984 British Leyland reduced its employment by 48%, Vauxhall by 39% and Talbot 77%.[52] Employment decline accompanied output decline but has been more rapid

---

[49] Source: Interview 1 and Lecture 2.

[50] Quoted from The Independent, 15/10/86.

[51] Quoted from 'Ford Document 3'.

[52] From 'Ford Document 3'.

permitting labour productivity to improve. Overall employment in the motor vehicles and parts sector fell 54% and output decreased 34% from 1979 to 1985 (Table 6.1). At the national level the unemployment rate of 5.4% in 1979 went up to 14.4% in 1987.[53]

Table 6.1
Employment and Output in the Motor Vehicles and Parts Sector, G.B.

Year	Employment	Output (1980=100)
1979	433,000	116
1985	281,000	86

Source: Employment Gazette, Historical Supplement nº 1, Apr/85; and CSO.

Changes in employment levels, occupational structure, economic recession, changes in union laws, and State policies, have all played a part in the restructuring of labour relations that have accompanied the introduction of new technology in the British car industry and at Ford Dagenham.

In Ford, the constraints on flexibility have been dissolved over a longer period and in a more cautious way than in its competitor companies in Britain. Possibly Ford was able to take a smoother path because, unlike British Leyland, it already had agreements on flexible deployment of labour and its job demarcations were not so rigid as BL's among production workers. The major problems Ford faced in the

---

[53] The Guardian, 20/03/87. The official rate of unemployment for 1987 was 11.7% but, this lower number resulted from changes in the method of compiling the official statistics made in October 1982, April and June 1983 and March 1986. Following the same procedures as in 1979 the independent Research Centre Unemployment Unit estimated the equivalent rate to be 14.4%.

implementation of its 1985 Agreement concerned craft maintenance jobs. But worker's representatives have been involved in the implementation of these changes and at least two years are expected to pass before the whole system is changed.

Assuming that assurances of greater job security for the remaining workers can facilitate the achievement of greater flexibility, Marsden et al (1985) stress two constraints: the conditions of the labour market and the power and organization of trade unions. They stress that the 1980s industrial relations policies of the car companies represent a break from the fire-fighting of the 1970s. The buoyant market of the 1960s and 1970s, made it difficult for the car companies to retain labour. Individual work groups' bargaining powers were increased by high labour turnover. High output demand pressed management into many concessions of job control to the workforce. This pattern was broken with the crisis of the late 1970s which helped management to regain the initiative in industrial relations.

Trade union organization and power in Britain has been weakened by increasing unemployment levels, by state measures, and by the agreements workers have accepted in order to secure employment. The abolition of long-standing demarcation lines signify completely new structures, arrangements and challenges for labour organization.

Chapter 7
INDUSTRIAL RELATIONS IN BRAZIL

The first recorded industrial dispute in Ford-Brasil was in 1957. In 20 years, between 1957 and 1977, 8 days and 9 hours were lost to industrial disputes. This 'industrial peace' was faciliated by state labour legislation, whereby the state presides over conflicts between capital and labour and plays its hand in favour of capital accumulation. Combined with this, the repressive measures taken by the military regime after the 'Coup d'Etat' in 1964 guaranteed the quietness of the labour movement.

Industrial relations in Brazil reached a turning point in 1979, with the eruption of many industrial disputes. By that time Brazil had already had 15 years of dictatorship. The period of greatest exploitation and repression was ending because of strikes and the growing organization of workers. The strikes started in the car industry in the ABC area (the towns of Santo André, São Bernardo and São Caetano), and in the Great São Paulo area, where Ford's car plant is located.

In this chapter the employment conditions in Brazil and the changes since 1979 will be presented through a consideration of events in Ford, in the car industry as a whole, in the ABC area and at the national level. Economic policies and political arrangements in Brazil are central for the understanding of the changes in management and labour relations. Two periods will be considered:

1. The late 1970s, when the old industrial relations pattern was broken.

2. The early 1980s when a new system of industrial

relations developed.

However, before discussing these changes, the history of the institutional framework of labour relations will be outlined.

1. The institutional framework of labour relations

Labour legislation

Brazilian labour legislation, which is consolidated in the Consolidação das Leis do Trabalho (CLT), extensively regulates the pattern of relations between workers and employers. It was created in the 1930s and 1940s, modelled on Mussolini's 'Carta del Lavoro' (Labour Code), and aimed at curbing the rising involvement of the working class in politics. At different moments in the history of Brazil since then, this legislation has been applied more liberally or strictly, according to the regime in power. Two major periods of change have modified the original conception of the system. One occurred in the late 1960s when modifications were made to fit the laws better to the military regime in power. The second, initiated by the new civilian government in 1985 and still in progress, has tried to incorporate democratic reforms into the old corporatist legislation.

In order to appreciate the significance of the recent changes in Brazilian industrial relations, and to establish the grounds for comparison with the British system, it is important to stress the main features of the system, as it was originally conceived, and the existing structures that

support the relationships between management and workers.[1]

Through the Consolidação das Leis do Trabalho, the state watches over the relationship between capital and labour and removes conflicts from the level of the firm. Any possible conflicts are resolved under legal controls: the state takes responsibility for the harmony of labour relations in order to maintain 'order and progress'.[2] Three aspects of the legal framework are of great importance: 1. the trade union structure, 2. wage and salary policies, 3. Labour turnover policies.

The trade union structure

Trade unions are organized in occupational 'categorias'.[3] Workers are allocated to a 'categoria', e.g. metalworkers, according to the major business interest of the firm. The 'categorias' are divided into geographical areas. The most frequent territorial area is a municipal district, although there are unions which act in more than one municipal district or even in the area of a whole federal State. The level of the federal States is effectively the highest tier of union organization in most industries. Exceptionally, however, there are trade unions which act at the national

---

[1] See, Rodrigues, 1966; Almeida, 1975; Troyano, 1978; Weffort, 1973.

[2] 'Order and Progress' is the positivist motto on the Brazilian flag.

[3] 'Categoria(s)' can refer either to a particular trade union (in the case of both the 'categoria' of metalworkers of São Bernardo, or the 'categoria' of metalworkers of São Paulo), or, it can refer to a broader classification including all the metalworkers of a larger geographical area such as the 'categoria' of the metalworkers of the State of São Paulo, which includes both the workers mentioned above and all other metalworkers in the State of São Paulo.

level, mainly service unions. Officially, until the early 1980s, the regional trade union was the smallest organizational unit of worker representation. No worker organization at shopfloor or company level, was allowed by the labour legislation.[4]

In this structure before the mid 1980s no horizontal relationships existed between trade unions. Thus, unions were allowed to have a relationship only if they represented the same 'categoria' of workers. All the trade unions of one 'categoria' are subordinated to the Federation of that 'categoria'. In the same way, all the Federations of one 'categoria' form a Confederation. There are seven workers' Confederations under the CLT. Before 1985 no General Confederation had ever been allowed.[5]

The creation of any trade union has to be approved by the Ministry of Labour. Also, until 1985 the Ministry of Labour mediated the relationship between the Confederations. Union rules (as well as those of the Federations and Confederations) are regulated by a standard statute prepared by the state. One of the rules is that they have to present their budget for the aproval of the Ministry of Labour. Trade unions have two sorts of income; the monthly payments of their members (a small part of the total), and the so-called 'trade-union contribution' (contribuição sindical) which is one day's pay for every worker of a trade union's territorial area deducted from company payrolls by the Ministry of Labour. The Ministry funds some of its own activities, such as training, from these funds and then allocates percentages to the Confederations,

---

[4] Almeida and Lowy, 1976.

[5] About demands for changes in the trade union strucutre in the mid 1970s see Almeida, 1975.

Federations and regional unions. Therefore, unions' incomes are provided by the state. The counterpart of income provision, however, is the availability of monetary sanctions against the unions. In the same way, union directors can be suspended, union buildings can be closed, audits can be instituted, and any sorts of federal intervention can be decreed by the Ministry of Labour.[6]

Wage and salary policies

Before 1965 wage and salary policy was based on a legislated minimum wage. All other wages were structured in relation to this social minimum and labour market supply and demand. The fundamental principle was of free negotiation between an individual worker and his/her employer.

From 1965 to 1979 government policy aimed at pressing down wage and salary levels. It was a period of high levels of inflation and the economic planners decided to transfer the onus of inflation reduction to the lower paid. Wages and salaries came to be adjusted for inflation annualy on the basis of rates determined by the government. These rates were usually far below the real rate of inflation.[7]

Since 1979 the government's official rate of wage adjustment has set the basis for collective bargaining. The success of the military governments' wage policies depended on the supression of the right to strike, but after 15 years of the military regime, workers began to defy the 'strike law', and develop different forms of collective

---

[6] On recent changes and the 'social pact' of the 'New Republic', see Almeida, 1985.

[7] DIEESE, 1975 and 1977; Mata and Bacha, 1973.

bargaining. Collective bargaining is not yet generalized as a form of wage settlement, but it is already widespread, particularly in the modern sectors of the economy.[8]

Labour turnover policy

In 1967 new legislation (the Fundo de Garantia do Tempo de Serviço (FGTS)) was passed giving employers the power to dismiss workers whenever they required, without having to supply a reason and without compensation. According to this legislation, employers deposit 8% of the monthly wage of each employee with the Ministry of Labour and when the worker is dismissed he or she has the right to take the sum for which he or she is eligible. The assumption of the law is that after working for one year, a dismissed worker would receive the equivalent of one month's wage. However, the deposited money is adjusted by a lower rate than the one which adjusts wages and usually, the payment from the fund is worth much less.

The FGTS supressed the old 'Lei da Estabilidade' which had made dismissals more and more costly to employers as employees' years of continuous service increased. Under the FGTS there is no job security of any kind. This allows stringent discipline of the labour force, a tight hold on wages and a greater intensification of work.[9]

---

[8] See DIEESE Monthly Bulletin, especially the section 'Acordos'.

[9] On the FGTS, see Ferrante, 1978; Vianna, 1978. On its effects on labour turnover see Silva, 1981.

2. The late seventies: breaking with old patterns.

Until the late 1970s, there were no direct negotiations over pay between Brazilian workers and the companies for which they worked. Wages were set by the Labour Tribunal based on Government Salary and Wage Policies which as we have seen, usually fixed the monthly rate of wage increases below the rate of inflation. These rates were applied to whole 'categorias' of workers whose annual payments were to be adjusted in a particular month. The month for the 'pay claim' of the metalworkers of São Bernardo do Campo, which includes all Ford workers at the São Bernardo site, is April.

In March 1978, the union of Metalworkers of São Bernardo do Campo, which represented all Ford workers at the site of São Bernardo, decided to approach management for a collective bargaining agreement. The union contacted the 16 Employer associations concerned, and invited them to establish procedures. This was a novel initiative. It meant that the state's power to rule on conditions of employment was being contested. The union proposal was rejected by the Employers who were not prepared to act outside of the State's tutelage, and they applied the traditional procedure.

From May 1978 Brazilian industrial relations started to turn into a more participative system. Workers in all the car companies and in many of the metal components industries in the region of São Bernardo [10] took a unique

---

[10] São Bernardo is the most productive industrial city in Brazil. In 1981 it produced 52% of the State of São Paulo's gross product, which represented 23% of the national accounts. The State of São Paulo total contribution to the GNP was 44%. (Rainho and Bargas, 1983, p.15).

form of strike action that took employers the state, and, to some extent, even the unions by surprise.

At the time strikes were prohibited by law and workers could be dismissed for no reason at all. Repression and violence were a common feature of day to day life. The form of the first strike was that strikers stood by their machines, arms crossed, mouths shut. Leaders were not appointed. The union was called into each of the companies to negotiate on behalf of the workers. Ford was the employer who most resisted negotiation and where the strike lasted longest (5 days).[11]

A wave of strikes followed in other industries beyond the ABC area. In August the Government decreed alterations in the strike law. The threat of prosecution of strikers under the National Security Law was withdrawn. But the new law still allowed employers to proceed to Dismissals for Just Cause, which meant that workers would loose any right to compensation for dismissal. Even so-called 'turtle' strikes (go-slows), equivalent to the British 'work-to-rule', could be repressed under the new law.

As Brazilian unions started meeting and talking to each other, the government prohibited inter-trade union meetings in September 1978 and employers prepared to prevent any possibility of further strike or go-slow actions. A document issued by the Industrial Federation of the State of São Paulo - FIESP, the most powerful employers organization in the country, recommended three tactics to

---

[11] For a detailed account of these events see Humphrey, 1982, pp. 160-6; Maroni, 1982; and Rainho and Bargas, 1983, p.73.

its affiliates.

1. 'Not to pay in any case for hours lost and not to agree any compensation. Since strike funds do not exist in Brazil, this will be an excellent resource for the companies'.[12]
2. 'To try by all means to get the strikers into public space... to involve the public powers in the strike and to exert psychological pressure on the employees unions...'.
3. 'To suspend for one or two days (on disciplinary grounds) those who entered the factory allegedly to work but who did not do so. In the latter case, to dismiss a certain number of people for Just Cause, and following this to ask workers to carry out a specific task. (Refusal will constitute an act of insubordination)'.[13]

The document concludes that these measures 'will increase employee insecurity. Usually after this is done, either the employees or the union will demand the reinstatement of these workers and propose a return to work' .

In the meantime the metalworkers union of São Bernardo was considering how to respond and, in October, it held a Congress where the trade union structure was debated. The union's basic aims were to strengthen the rank and file, improve shopfloor organization and take the union to the factories. Union directors decided to rotate their posts and take on production jobs too, after questions were

---

[12] Because the unions have no strike fund or social security, demands for payment for days on strike become one of the key demands, always present in any strike.

[13] Quoted from 'Apêndice 20' in Rainho and Bargas, 1983, p. 213.

raised about how bureaucratic duties could damage contact with and knowledge about day to day life in the factory. The Federation of Metalworkers of the State of São Paulo, to which the Metalworkers of São Bernardo is linked, held another Congress in which a proposal to establish Factory Committees was rejected because more conservative trade unionists feared that these new institutions would compete with traditional union structures. However, in this congress the first general discussion about the creation of the Workers Party - PT (Partido dos Trabalhadores) - also took place.

The strategy for the April 1979 pay claim in São Bernardo was different from that of previous years. From the beginning of the year the union held various meetings with workers from the major factories, 'taking the factories to the union'. The claim was presented by the Federation of Metalworkers of the State of São Paulo, representing 33 unions. They demanded a common pay claim date instead of the two that currently existed - one for the metalworkers of the Capital and the interior of the State in November, and one for the ABC region in April. These were the first direct collective negotiations. The demand for a 'delegado sindical' was one of the most important demands. The 'delegado sindical', was to be a sort of British trade union official in the factory, who would have security of employment. After the leaking of a document from one of the employers associations recommending companies to build up stocks as a precaution against strike action, the unions recommended an overtime ban.

Collective negotiations started in March 1979, but though it was significant that face to face discussions were happenning, at first concessions by employers did not go beyond current Labour Tribunal rulings, The conservative

Federation of Metalworkers of the State of São Paulo accepted the employers offer but the unions in the ABC rejected it and called a strike. The strike was declared illegal by the Labour Tribunal. Nevertheless it went ahead and the unions created a Strike Fund based on public donations of money, food and clothes, assisted by the progressive Catholic Church in São Bernardo. On the 18th of March, 5 days after the strike started, a meeting of 80,000 was held in the public football stadium with the permission of the São Bernardo's mayor. The strike clearly represented much more than simply an industrial dispute and was bound up with claims for democratic reforms.

But, the relations of power were not favourable to the workers. 10 days after the strike started the Ministry of Labour decreed intervention in the three unions involved in the dispute. Four days later the Employers Federation-FIESP - proposed a 45 day 'truce'. The workers were precariously organized in their new headquarters in the São Bernardo church. FIESP had declared publicly that they would not negotiate, the football stadium was closed on the grounds of national security, the unions were under intervention, and the union directors remained officially stripped of their power to negotiate. Some workers were returning to work. In this situation, it was convenient for the unions to negotiate the truce.

The terms of the 'truce' were that the strike would end, negotiations would be reopened, no penalties would be applied to any worker (including no dismissal for 120 days), Committees would be set up to work on proposals for changes in the union structures and the law on employment guarantees and compensation for dismissal (FGTS - Fundo de Garantia do Tempo de Serviço). Moreover, federal intervention in the unions would be withdrawn after the

truce period. Thus, the strike ended and a very tense truce started.

Celebrations for the 1st of May occurred during the truce period. More than 60 trade unions were represented in a gathering of 150 thousand people in the football stadium of São Bernardo (Vila Euclides), while only 10 thousand people appeared in the football stadium in São Paulo (Pacaembú) where the government had prepared the official celebration for the worker's day.

The 13th of May was the end of the truce, time to vote either to strike again or to accept the negotiated terms. The wage increase offered by the employers was significantly higher than that accepted in April by the Federation of Metalworkers. Half of the hours lost on strike would be deducted over 5 months, the other half would be made up on overtime. The days lost would not result in any deductions from any welfare benefit or holidays. The union directors (ex-diretors at the time) proposed acceptance of the deal. The workers however, were more prepared to strike and great efforts had to be made to convince them that a strike would not be the best alternative. The main leader of the movement, Lula, recently pointed out that 'the main thing I, and all the companions at the union, had to do in 1980 was to regain the trust of the workers. People we trusted a lot advised us strongly that we should accept the deal, although we did not feel we should. We did not trust ourselves and the 'categoria' as much as we should have.[14]

In an atempt to restrain workers mobilization the

---

[14] Interview with Luís Inácio da Silva (Lula) in London, 28/09/1984.

Government's Salary and Wage Policy was modified in October 1979, changing from annual to six-monthly inflation adjustments, establishing that lower wages would be increased at higher rates, introducing productivity increases based on sectoral performance, and establishing double monthly payments as compensation for workers dismissed up to one month before the date of wage readjustments. In fact these new policies really only institutionalized what was already the practice in the negotiations of many 'categorias' of workers, such as the metalworkers of São Bernardo. The politically advanced unions understood that their achievements were receiving official recognition although the state profited from its apparent benevolence and concern for democracy and the working population. It is true that achievements of the most advanced sectors were extended to the whole country, under pressure of fears that economic modernization would be damaged if the speed of events were not controlled.

The break with the old pattern of industrial relations implied fighting against the power of the state to determine employment conditions, and facing repression and violence from both the government and the employers inside and outside the factories. The possibility of such actions was in itself an achievement for the time. The core of the issues in dispute were the demands for direct negotiations over pay and working conditions and for new forms of shopfloor organization around the claim for the 'delegado sindical'. These issues implied both contesting existing trade union structures by building up links between workers at the horizontal level (inter-unions and plant-level), and on linking working conditions with politics through the creation of the 'Partido dos Trabalhadores' - PT (Workers Party).

The fact that this movement was started and strongly supported by the car workers was viewed by Humphrey (1982) as a consequence of their proximity to the wealth of their industry combined with their continuous exclusion from a share in the gains. He argues that although this was not a condition unique to the car workers, it was more apparent in the ABC area where about 85% of car production in the country was located and where labour market conditions have led to workers having job experience in numerous car companies allowing for a greater sense of identity and a common awareness of their working lives.

In Ford, worker organization developed alongside that of the 'categoria',[15] but strikes at Ford alone also occurred. In Ford São Bernardo a strike occurred on the 9th of March 1979 involving all the shopfloor workers against the deduction of 10% of the days lost on strike from their monthly wage. The company called in the suspended union directors to negotiate and withdrew the deductions. Other companies in the area followed suit. Two other strikes occurred at Ford in 1979 over the deduction of wages for days lost during the strike in March. In September 700 workers in Stamping and the Toolroom stopped for 2 hours. In December 2,500 workers in the Powertrain stopped for one hour. There are no accounts in the company's records of how the disputes were resolved.

The labour peace at the company from the late 1950s to the late 1970s was reversed by the movements that occurred in 1978 and 1979, and new patterns of relations between management and workers began to emerge as further industrial disputes arose around issues of the structure

---

[15] For the development of industrial relations in the Brazilian motor industry before the late 1970s see, Rodrigues, 1970; Humphrey, 1982 and 1984a.

and rights of trade unions. In particular, direct bargainning was initiated and provided the grounds for the further development of shopfloor organization.

3. The early 1980s: Building a new industrial relations system

In the April 1980 pay claim and political issues were the most important. Workers were confident of their strength, had greater experience of organization as a result of the previous struggles and believed that only when their machines were silent would they be heard.

Besides continuing claims for wage increases above the rate of inflation and for 'delegado sindical', the unions also added demands for a reduction in the working week from 48 to 40 hours with no reduction in wages, and for employment security for all employees for one year, in other words an agreement for no dismissals called 'stability of employment'. This latter issue was a vital claim because labour turnover rates were very high and workers hired to replace those fired usually earned, at least during their first 3 months, a lower wage. As a result, chances of promotion and employment stability were limited and the companies kept their pay rolls low. The union considered that the wage increase would be useless if stability of employment did not accompany it.[16]

The employers were tougher than in the previous pay claim

---

[16] The implications of the high labour turnover rates for the trade union movement, and the hire and fire system largely used by companies in Brazil during the 1970s, are discussed in Chapter 9. On the companies' labour turnover policies in the 1970s see Silva, 1981.

negotiations, and made no concessions at all in the first round of talks. The strike started on the 1st April throughout the ABC area with no picketing and lasted 41 days. In the third week the Ministry of Labour once again intervened in the three unions involved and another three weeks passed before the strike was ended. There were many street battles between workers and the police. Union leaders were arrested and were later prosecuted under the National Security Law, including Lula, who was becoming a major leader of P.T. (Workers' Party).

Some companies were dissatisfied with the events but none split from FIESP to negotiate with the unions. Instead, they stuck together under the protection of the Ministry of Labour and the repressive legislation.

The strike ended with a wage increase below the claim but above the government's norm. No reduction in the working week, no 'delegado sindical', and no stability of employment were achieved.

The issue of stability of employment sustained more than 100,000 strikers for 41 days despite imprisonment and arrest of leaders and workers, loss of the union infrastructure, no wages and very tiny monetary help from the Strike Fund (only food was distributed at the collection posts and money was given only for rent, electricity and gas). The workers were not pleased with the achievements of such a hard struggle, but they were satisfied to know that they could endure for so long in such adverse conditions. Workers' anger against employers and the state grew bigger. They agreed to return to work at the request of the deposed union leaders, but there was no resignation at the end of the strike.

Neither employers nor government were pleased with the results of the strike. They had lost a lot in order to resist conceding bargaining rights to the workers, and the question of changes to the industrial relations system, both at the national level and in the factories, remained unresolved. It remained clear that new forms of regulation of the labour force were required.[17]

The issue that was becoming of greatest concern to the employers was the influence of the unions on their business. Any form of worker representation on the shopfloor, such as 'delegado sindical' or Factory Committee, was seen as taboo by some employers. On the other hand they, particularly those employing large numbers of workers, needed legitimate employee representatives at a time when workers were contesting the state's power. However, there was no consensus among employers about whether such representation was necessary, or if it should be in the form of the 'delegado sindical' or some other form of representation. The car industry was most concerned about this because they were most pressured to change their industrial relation systems.

In 1979 the big motor companies based in the ABC area - Ford, Volkswagen, General Motors, Scania and Mercedes (Daimler Benz) - had discussions amongst themselves on

---

[17] I do not share Humphrey's view (1982, p.200) that in the 1980 strike '... employers had won the outright victory denied to them in 1979' because workers did not capitulate in face of the repressive measures taken by the State with employers' support. In the events which followed, the deposed leadership was the only legitimate negotiator accepted in building a new industrial relations system. A 'clear political victory', as Humphrey assesses the event, would not have resulted in employers having, very shortly after, to call on workers to negotiate over the claims they had just denied.

various proposals though they did not make their concern public. Their consensus was that something should be done and that, when the moment came to concede some sort of undefined representation, they should concede the same structure in all the companies and stick together.[18]

In September 1980 Volkswagen broke with this agreement by offering its employees an 'Internal System of Employee Representation', while the Metalworkers union of São Bernardo was under intervention by the Ministry of Labour. It was made public that Volkswagen had discussed the matter with the Minister and obtained approval. The move was an attempt to take a lead in innovations in industrial relations in the company where workers were most organized. Volkswagen's 'System of Employee Representation' was not negotiated or discussed with employees. It was a structured system 'offered' to employees, that could be changed by management without notice or even consultation. Employees could elect representatives only from workers with more than 5 years service in the company, to occupy the 17 representative posts. 7 of the representatives were to be hourly-paid and union members, 7 also hourly-paid but non-union members and the other 3 white-collar staff for whom it was not a matter of concern in the rules whether they were union members or not. These representatives would hold 3 meetings per year with management to discuss matters concerning the workers they represented and 'inform' management about problems that occurred during day to day working. They had no status or procedures to deal with

---

[18] This account of the car companies' search for a new form of workers' representation is based on an interview with Ford's Industrial Relations Manager carried out in September 1983.

grievances.[19]

This 'System' was much criticized and it reinforced VW's reputation of being very tough in industrial relations rather then being seen as indicating a new tendency towards liberalization. The deposed union leaders organized opposition to VW's system. Representatives were elected with only 38% of the employees participating in the elections.[20] Volkswagen's initiative had shown that employee representation would meet union opposition if the unions were not involved in the process, and that the union remained strong, even when officially non-existent.

After taking over the Union of the Metalworkers of São Bernardo in 1980, the state and employers were left with no legitimate representatives with whom to negotiate. They could not ignore the deposed leaders influence not only because they had proved their ability to lead the 'categoria' over isssues such as VW's system of employee representation but also because their prosecution under the National Security Law had provoked solidarity stoppages.[21]

There was a vacuum of legitimate union representation for the April 1981 negotiations. Employers were worried about negotiating with workers' chosen representatives since these would necessarily be favourable to the deposed leaders, as the new elections for the union directors (equivalent to the British union executives) allowed by the Ministry of Labour demonstrated. Nevertheless, in the negotiations not much was conceded by the employers and

---

[19] Almeida, 1983.

[20] Based on figures in Humphrey, 1982, p. 203.

[21] Ford's records show two stoppages in February 1981 due to Lula's trial.

little was gained by the workers compared to what they had claimed, which remained the same demands as in 1980.

These emergent labour policies were to be implemented and developed in a period of economic crisis. In 1981 an economic recession hit all sectors of the economy due to the vulnerability of the country to the 1979 world oil crisis and the rising foreign debt. Industrial production and employment levels fell. Vehicle production (cars, vans, buses and trucks) dropped 33% compared to 1980 (cars alone fell 37.2%). Employment in the car industry dropped 11%. In Ford-Brasil employment fell 9%; at the São Bernardo site 6%.[22] Although the downward trend was reversed in 1982, not until 1986 did production approach the 1980 level. Employment continued to decline until 1984, then increased in 1985 and 1986 but not up to the 1980 level. In Ford's São Bernardo site recovery was much quicker. In 1983 both employment and production were above the 1980 level, with production recovering more quickly than employment. In terms of productivity, the level of output per employee in 1982 exceeded the level of 1980 showing that the 1981 crisis had provided suitable conditions for restructuring production. (Table 7.1).

The sectors more linked to the international economy escaped from the adversities of the domestic market through increasing exports. The proportion of Ford cars exported jumped from 2.3% in 1980 to 12.8% in 1981. (Table 7.2).

---

[22] Source: ANFAVEA and LEI 4923.

Table 7.1
Employment and production at Ford, São Bernardo

Year	Employment (1)	Car production (2)	(2)/(1)
1980	12,555	123,380	9.8
1981	11,771	99,372	8.4
1982	11,200	111,977	10.0
1983	12,858	134,795	10.5
1984	13,104	141,902	10.8
1985	12,876 (*)	146,425	11.4

(*) Average until June
Source: (1) Lei 4923, Ministry of Labour (Includes all the employees on the site)
(2) ANFAVEA.

Table 7.2
Index of total car production and proportion of exports in the car industry and in Ford-Brasil

Year	Total car production	% exports/production Whole sector	Ford
1980	100.0	12.4	2.3
1981	62.8	26.8	12.8
1982	72.1	17.9	13.2
1983	80.2	17.7	10.3
1984	72.8	22.4	22.8
1985	81.4	21.2	16.3

Source: ANFAVEA. Total production 1980 = 933,152 cars; see Ford's production figures in Table 7.1.

The crisis in 1981 facilitated production restructuring, and stimulated a rise in exports and pushed the strategies of the car companies towards greater involvement with the international market. Productivity in Ford São Bernardo increased steadly from 1982 to 1985 reaching 11.4 cars per employee after having fallen from 9.8 in 1980 to 8.4 in 1981. (Table 7.1).

The recession gave the employers an opportunity to hit back at the unions. Many workers were sacked because of the

previous strikes or because of economic recession. The most active during the strikes were the most likely to get the sack in the economic recession. Dismissals were commonly used to 'discipline' workers. Inevitably the adversities of this period affected workers' organization, but, they did not prevent workers fighting for their jobs and the rights they were struggling to achieve.

In order to cover the losses arising from the recession, Volkswagen proposed in April 1981 to cut the working week and pay of production workers by approximately 20%. The proposal required union consent. Although the Employee Representatives produced a petition of 22,000 signatures in favour of the proposal amounting to 60% of the employees, the ballot organized by the union which followed, recorded only 21% of the employees in favour and the union rejected the company's proposal. Volkswagen then threatened 5,000 redundancies. A strike call was made by the union, the company resisted and, for the first time since strikes began in 1978, the government intervened to suggest that the company could afford to make some sacrifices given the profits made in the past.[23] The state's continuous tutelage over relations between capital and labour, modeled on the facist corporatist legislation, was weakening. Labour conflicts were coming to be viewed more and more as a matter primarily concerning employers and employees.

In July 1981, the first National Conference of the Working Class (CONCLAT - Confederação Nacional das Classes Trabalhadoras) was held near São Paulo with 6,000 delegates from all 22 Brazilian states representing rural, industrial and service workers. Although activities of this kind were prohibited by law they could no longer be prevented. Both

---

[23] Quoted from 'FSP', 29/4/1981 in Humphrey, 1982, p.205.

conservative and radical union leaders united in demanding changes in the labour laws.

In the meantime Ford management had realized that a system of worker representation could not exclude the union.[24] They realized this after the dismissal of 400 workers in July 1981 provoked a 6-day strike for reinstatement of the workers and for security of employment. Once again the form of strike action used in May 1978, entering the factory but not working, was employed. Accounts of the formation of the Factory Committee in São Bernardo at this time [25] relate that even though it was clear Ford would not reinstate workers, the workers intended to force acceptance of a Factory Committee. (Lula, the deposed union president, was leading this movement once again).

The workers, organized by manufacturing areas, formed a Committee to negotiate, but the company refused to talk. An incident in which a worker set fire to an oil barrel in anger, worried management and induced them to open discussions with the workers, though they refused to accept the Factory Committee. The strike continued and was ended only after the company accepted a Workers Provisional Committee to discuss regulations for a Factory Committee to be installed in January 1982. During this strike, according to the director of Industrial Relations of the time, the company saw that the situation was very delicate because it was the first strike that had explicitly demanded a Factory Committee. The company was already prepared to have a system of worker representation but did not want to give it as a result of strike action because '...workers would

---

[24] Interview with former director of Industrial Relations, Ford-Brasil, September 1983.

[25] Interview with Factory Committee member in Jan/86.

think that only by striking could they achieve their claims and would see no conviction on the part of the company in having a system of workers representation'.[26]

In August Ford dismissed another 923 workers and 321 more were dismissed in the last four months of 1981.[27] In addition to the influence of economic recession Paint automation started in mid 1981 in São Bernardo and some of these job cuts could be related to this. In the year 2,119 Ford's workers/employees were dismissed and 621 were hired at São Bernardo.[28] In the last week of November there was a strike of the whole factory for two days because of the dismissal of 11 workers. From 1982 onwards the Factory Committee began to have some influence on the employment policies of the company. Labour turnover rates decreased though fluctuations in employment levels indicate that

---

[26] Ford's views of these events are based on the interview with their former industrial relations director carried out in September 1983. As will be seen in more detail in Chapters 8 and 9, the creation of the Factory Committee was important to the company because it needed to have a leadership with whom to negotiate the changes it wanted to implement in the near future, especially those related to increasing the quality of the product, including the Employee Involvement Programme.

[27] In his account of the results of the strike in July 1981 Humphrey (1982, p.206) points out that 'The 400 dismissed workers were given priority for readmission, all the workers in the plant were guaranteed four months' stability, and the firm formally recognized the factory committee'. My account differs from Humphrey's. The continuance of dismissals following the strike contradicts the existence of an employment stability agreement, or, if such an agreement was made, that the workers could not sustain the agreement. In fact, although the Factory Committee was born out of the strike, it did not have an official role until six months later.

[28] LEI 4923, Ministério do Trabalho, Brasília.

adjustments in the employment structure were being made.[29]

In 1982, as a consequence of the recession, the major issue affecting the Brazilian working class was unemployment and the Metalworkers of São Bernardo organized an overtime ban. The major issues in the Pay Claim were increased overtime payment rates and a shorter working week (without reductions in pay). In May there was a 5 day strike on this issue. The union strategy to prevent falling employment was to make the costs of overtime higher than those of new recruitment. The campaign emphasized to the workers that by working longer hours they were taking away their colleagues jobs, and their own in the long run. Negotiations ended and overtime pay was doubled.

In Ford São Bernardo employment was reduced by a further 5% in 1982, to 11% below the 1980 level. However, as Table 7.1 shows, productivity was higher because of an increased workpace and extensive use of overtime. As one member of the Factory Committee pointed out '... there were no means to control the workpace. We had no control over the pace of the line, and workers were threatened with the sack if they refused to do overtime'.[30] With unemployment rising, only collective action could mitigate workers' fears of dismissals for 'not cooperating' with management.

Increasing discipline through hire and fire had been a common practice since the 1970s. Workers struggles against

---

[29] For a more detailed account of the industrial disputes at São Bernardo in 1978 and 1979 see Rainho and Bargas, 1983. For an analysis of the strike of May 1978 see Maroni, 1982; and for the period from May 1978 to 1981 see Humphrey, 1982, pages 160 to 245. The changes in labour turnover policies will be discussed in Chapter 9.

[30] Interview January 1986.

arbitrary dismissals had been prominent in the early 1980s and some restraints on dismissals were achieved. However, the changes in labour turnover policies can not be attributed solely to workers' organization since the production process was also changing, particularly after 1982, and the company itself was coming to have more of an interest in employment stability.

The early 1980s highlighted the growing importance of political issues related to shopfloor representation and the role of the state in the regulation of capital and labour relations. After a period of increased violence and repression from both the state and employers, the industrial relations system began to be changed. The car industry led the way in the recognition of shopfloor representation, and the unions began to be involved in organization at factory level. Ford's Factory Committee, for instance, was established as a union body because management did not believe that they could effectively exclude the union.

Productivity trends in the car industry were upward from 1982 to 1985 and were accompanied by increased worker organization and higher unemployment. Even in the downturn, unemployment did not prevent union struggles in the ABC area, though it may have affected the sort of claims that were made, turning them to overtime bans, overtime payment increases and a shorter working week, rather than greater wage increases and demands for stronger worker organization on the shopfloor.

These years were a turning point both for the integration of the car companies Brazilian subsidiaries into the international market and in terms of state control over labour. From this time plans for the introduction of new

technology and changes in the production process began to be developed and policies on hire and fire and labour turnover also began to change. This partly reflected the internal needs of the company and partly shifts in the political climate and the position of the labour movement in Brazil. The integration of these developments will become clearer in the next chapter, in the context of the changes in the production processes at São Bernardo.

Chapter 8
SÃO BERNARDO: NEW PRODUCTION PROCESSES AND INTERNATIONAL INTEGRATION

This chapter discusses both the changes in industrial relations in Brazil, since the early 1980s, and the basic continuities of the system which has regulated conditions of employment since the beginning of the industrialization period. As described in the previous chapter, 1978 was the turning point in industrial relations in Brazil because collective action by workers at factory level began to occur then, for the first time since the military government took power in 1964. Events at the national level from 1979 onwards form the context for the discussion of the introduction of new technology. In Ford São Bernardo only 7 working days had been lost between 1957 and 1977 due to industrial disputes. From 1978 to 1986 over 100 working days were lost, more than a half in strikes involving the whole 'categoria' of metalworkers of the São Bernardo area alongside other workers in movements against the state and employer policies.

1. Changes with new technology. Democracy?

In February 1983 the president of the Ford Motor Company visited São Bernardo to launch the new production processes, of which the robots were the major stars. Together with the start-up of the robots Ford announced plans to take on 2,000 workers and increase production capacity by 40%. The new recruitment would represent an 18% rise in employment over the average level during 1982. In fact average employment in 1983 was 14% above the 1982 level and production was increased 17%.

Arguing against workers fears of unemployment, the company announced that the 8 robots installed for Body Assembly would replace 16 direct production workers, but that jobs would increase once automation raised quality and competitive power in the international market.[1]

A programme of training on the new equipment was being developed since late 1982. Top managers, engineers and technicians were sent to Europe or Japan and in-house programmes involved engineers, technicians and maintenance workers. Supervisors and hourly direct workers were not given any formal training, though some of them were trained by helping in the installation of the new manufacturing facilities. Some operators, particularly those who worked in electronics areas were given training on Programmable Logic Controllers. Instructions on machine operations were translated into Portuguese, new explanations were added and, through the use of charts and instructions, further instruction was done on-the-job. Other training policies were directed towards increasing co-operation from the workers and improving quality, and some changes in job contents were made.

When the new production process started, the first problems came in the Paint shop and were widely covered by the Press. The automatic spraying system did not work well. The workers seemed to be delighted that robots could not work as well as human beings. But within a couple of weeks, the problems were sorted out. Management was initially bewildered by the new automation; but the company was at pains to make it work. The fuss made in the Press about it appeared to shift attention from concerns about job cuts and changes in working practices. In Body Assembly

---

[1] From 'O ESP', 03/02/83; and 'FSP', 07 and 08/03/83.

operations the automatic system, including the robots, did not require major adjustment and operated well from the beginning, except that one of the robots was withdrawn because manual operation was found to be more efficient for the job, which was welding a curve on the body side.

In mid July 1983 the new installations were presented to the Press prior to the Escort launch two weeks later. But one week before the launch a one day General Strike by almost all Brazilian workers took place. Because it had been announced in advance, the strike did not hinder Ford's production. According to the IR manager at the time 'The company did not take any action gainst the Factory Committee to prevent the strike because of the understanding that it was a particular event of national dimensions. The Committee was no more than the union's arm in those circumstances'.[2]

Advances in workers political organization continued with the creation in August 1983 of the Central Unica dos Trabalhadores (CUT - Unique Confederation of Workers) a union federation that was not recognized by the State. CUT included the more politicized union leadership linked to the P.T., but the more conservative unions remained in the embryonic Confederaçào Nacional das Classes Trabalhadores (CONCLAT - Confederation of the Working Classes), which became a confederation in 1984, linked to the Partido Movimento Democrática Brasileiro (PMDB - Brazilian Democratic Movement Party) and the two Communist Parties (Brazilian Communist Party and Communist Party of Brazil).

As part of its new employment policies for these new times, Ford announced in mid December 1983 a programme of

---

[2] Interview September 1983.

voluntary redundancies for 205 hourly workers in São Bernardo. In previous years no such announcement about dismissals (either collective or individual) would have been made. In mid January 1984 another 350 redundancies were offered. The basic qualification to apply for voluntary redundancy was to be over 55 years old.[3] The union argued against the company encouraging workers to become unemployed but they were tied down by the voluntary character of the redundancies and by the speed with which the company's target for redundancies was achieved. Ford was also hiring workers at the same time. Amongst those hired in 1984 were 44 electronic maintenance workers. As Carvalho points out this fitted in with the labour requirements of the new production process.[4]

At national level a wide campaign for direct elections for the Presidency of Brazil was taking place from late 1983. The more combative trade unions and the P.T. (Workers Party) took a leading role in organizing public meetings and marches, but virtually all the political parties were involved in the popular demand for democratization.

Also at the national level, automation was becoming a matter of concern. The Secretary of Informatics was taking firmer steps in its policy of 'market reserve', and the impact of automation on the trade unions was not yet clear. Ford was the first manufacturing company to introduce robots and Volkswagen followed shortly afterwards. A Commission was formed by the Secretary of Informatics in March 1984 to study the social and economic aspects of

---

[3] The redundancy package offer was a sum totalling half of a monthly wage for each year of service in the company, one month's wage for each dependent and 45 days holiday pay for these over 45 years old ('O ESP', 24/01/84).

[4] Carvalho, 1986, p. 223.

automation in manufacturing and to report by May. This Commission was the first in a series of three, designed to formulate employment policies in relation to automation. The aim was to provoke a public debate around automation and to increase popular support for the policy of 'market reserve'. The coordination of this first Commission was given to the Departamento Intersindical de Estatística e Estudos Sócio-Econômicos (DIEESE - Inter Trade union Department of Statistics and Socio Economic Studies), a research institute maintained by the trade unions. The government wanted to get union support for its policies on automation. The Commission's report concluded that automation was an irreversible tendency that would affect employment conditions, and that the existing regulations of relations between capital and labour in Brazil were inadequate in face of such technical progress, particularly in so far as it inhibited shopfloor representation, access to company information related to the labour process and the development of internal industrial relations systems.[5]

In Ford São Bernardo, 1983 and 1984 were calmer years in terms of major industrial disputes. Workers' actions mainly took the form of short stoppages or work-to-rules ('turtle operation') in single sections such as metal finishing, small presses, or seat assembly. Out of the 15 strike actions in Ford's records in 1983 and 1984, 2 were related to national political issues (solidarity with the oil workers and the July 1983 General Strike) and involved all the workers in the factory, 9 occurred in isolated sections and lasted only for minutes or hours. Only in the other 3 were all the workers involved.

A four day walk-out in November 1983 was motivated by

---

[5] Commission's Report published in SEI, 1984.

dissatisfaction with the level of the six-monthly wage readjustment to compensate for inflation. During this strike the president of Ford-Brasil was reported in the newspapers as saying that Brazil '... is the best country for producing cars, after Japan ... I would like to concentrate investments in Brazil, transforming it into a base for vehicle exports to the world'.[6]

The six-day industrial dispute in April 1984 took the form of 'turtle operation' (work-to-rule). Although the main motive was increased pay, the fear of unemployment related to automation appeared in the leaders' statements even if not in the actual claim. About five weeks after this strike ended the president of Ford-Brasil claimed 'The vehicles produced in Brazil are competitive in the international market and can compete with the Japanese'.[7]

In December 1984 a new form of industrial action, the 'pop corn strike',[8] lasted 2 days followed by a complete stoppage of the whole site for another 2 days and an occupation of the factory for one more day.[9] In this event the Factory Committee played a major role, and according to one of its members '... this was the most beautiful labour movement in Ford up to now' (January 1986).

The dispute started with the demand that Ford equalize pay with Volkswagen by conceding payment in December for 80

---

[6] 'FSP' 09/11/83.

[7] 'O ESP', 22/05/85.

[8] So-called because the strikes pop out suddenly, without warning, all over the place.

[9] This is the last strike reported in Ford's records which had not been updated by 1985/86.

hours more than the 240 standard monthly hours. The 'pop corn strike' consisted of stopping some machines while others were still working, scattering stoppages around without any prior warning to management. Management reacted by turning machines off, to block the 'pop corn' strategy and workers responded by going to a complete stoppage. The company suspended 3 of the Factory Committee and workers occupied the factory. Management called the union to negotiate, suspended some Factory Committee members (one for one year and two for six months each) and demanded a commitment from the workers to work 4 Saturdays overtime at the overtime pay rate (50% more than normal hours) to recover production lost. In the end, one member of the Factory Committee remained suspended for one month, the company paid workers for the days lost on strike (including the weekend) and the 3 month trial period for newly recruited hourly paid workers was eliminated from the wage structure.

Ford management was widely reported to be very worried about such occurrences.[10] Soon after this strike ended Ford proposed to negotiate with the union a long-term deal for stability of employment in exchange for a no-strike pledge and acceptance of overtime at production peaks. The aim of this proposal was to secure continuity of production for exports. According to the company's president, 'In the domestic market consumers wait for 15 or 20 days, but in exports the delay of one delivery can lead to the loss of an entire market'.[11] At this time Ford was considering producing the Sierra in Brazil. Plans were conditional on the possibility of exporting Sierras to the United States. If they went ahead a further US$ 200 million would be

---

[10] 'FSP' 18/12/84.

[11] 'Gazeta Mercantil', 20/12/84.

invested. 'But...' the company's president emphasized, 'we can not take the risk of having production stopped by strikes'.

The union rejected the company's proposal on the grounds firstly that it would be contradictory to sign such a deal on overtime when there was a national campaign to reduce working time going on, and secondly that workers could not compromise their most important instrument of struggle, the right to strike. Instead, the union emphasized that strikes were occurring because of the company's unwillingness to meet workers' claims.[12]

Ford's proposal also raised angry comments from FIESP directors, who said that the company was acting against the interests of its supporters. It argued that if Ford were to give stability of employment it would damage industrial relations in other companies. The proposal was rejected by other employers on the grounds that it was an 'imported idea', 'not suitable to Brazilian conditions'.[13] In breaking with the employers consensus of a refusal to bargain over the union's long established demand for stability of employment, Ford was putting forward a unique industrial relations strategy, aiming at a company based union organization, instead of having its industrial relations system simply a part of the whole metal industry category in the area. The contents of the stability/no-strike proposal fitted in with the company's strategy to 'modernize' capital and labour relations, of which the recognition of the Factory Committee was another

---

[12] 'Diário do Grande ABC', 21/12/84.

[13] 'Gazeta Mercantil', 21/12/84.

part.[14]

In March 1985 the Brazilian military began passing power to a civilian government after 21 years of power. This was a result of the national campaign for direct elections. A national alliance between the Brazilian Democratic Movement Party (PMDB), the centre party, and the Social Democratic Party (PDS), the right-wing, resulted in the election as president of Tancredo Neves (PMDB). However, weeks before his inauguration Tancredo fell ill and died and his vice-president, Sarney (PDS) took power. The 'new republic' was faced with a 200% annual rate of inflation, a US$ 100 billion external debt and an almost bankrupt national treasury, together with a key question of political democracy.

Changes in the Labour Laws were amongst the first policies of the new civilian government, as part of its aim to build up a 'Social Pact' as a major priority. The Ministry of Labour conceded an amnesty to the union leaders who had been punished during the last two decades and allowed the formation of Inter Trade union Confederations and the right of unions to establish their own election procedures. The two existing, but not yet officially recognized, Confederations - CONCLAT and CUT - became legal.

The Pay claim of the metalworkers of the ABC area on the 1st of April 1985 was the first test of the balance of power behind the 'Social Pact' sought by the government.[15] On April the 11th, 155,300 metalworkers in the ABC area (91% of those employed in the metal industry) plus 84,860 metalworkers in five other cities near to São Paulo (76% of

---

[14] 'Gazeta Mercantil, 21/12/84.

[15] 'Isto é', 06/03, 03/04 and 10/04/85.

total employees in the metal industry) went on strike.[16] The unions were affiliated to the CUT, which was linked to the PT (Workers Party). The basic claims were for an increase in wages, an inflation adjustment in wages every three months, a reduction in the working week from 48 hours to 40, the 'professional wage',[17] and a unified career plan based on a standard three promotion steps for each group of jobs in every company.[18]

The strike strategy consisted of synchronized stoppages in different companies following a plan designed to destabilize both the flow of components production and car production itself. The aim of this innovative strategy was to minimize losses for workers and to disrupt production by taking advantage of the interdependence and competition between producers, and by exploring the weaknesses arising from the newly developing integration between component suppliers and car producers. The apparent unpredictability of the stoppages led to it being nicknamed 'wild cow' strikes. Close links between the unions and the shopfloor was essential for the success of the strategy. However, as Zilbovicius et al (1986) pointed out the 'wild cow'

---

[16] The cities were Taubaté, São José dos Campos, Itu, Sorocaba and Campinas.

[17] 'Professional wage' (or salary) means the establishment of common pay levels for the same jobs. For instance, toolmakers, maintenance workers, welders, and cleaners, would be differentiated as jobs but each individuals would receive the standard pay for that job classification no matter in which company they were employed. More detailed discussion is in Chapter 9.

[18] 'Boletim DIEESE', maio 1985; 'FSP' 09/05/85. These demands may have been inspired by the seven week strike for a reduction in working hours from 40 to 35, without reduction in earnings, that had been led by the German car workers in 1984. The IG-Metal achieved a 38 hour weekly (37 in some companies) with no reduction in wages.

strategy, combined with 'turtle stoppages' and 'pop corn' strikes worked better in theory than in reality because workers got confused with the varied orders to 'stop and go', whose immediate aim was often obscure to them.[19]

Besides the organizational problems of the new strategy, the strike also occurred at a delicate moment of national politics. It came at the time of the illness of Tancredo Neves, the new civilian president, and many groups feared that the young and fragile Brazilian democratic project could be seriously damaged. The Governor of the State of São Paulo was quoted in the press as saying '... agitators are leading the way back to dictatorship', while the Minister of Labour reminded the unions that '... workers have a lot to loose in a political reaction'.[20] Union leaders replied to these attacks by saying that management was taking advantage of the president elect's illness and the sensitive political situation by taking a hard line and that they would not allow employers to impose new sacrifices on the workers. However, the union leaders did publicly state that they would support Sarney's succession to the presidency if Tancredo died and there was any attempt at a military coup.[21] From the employers' point of view it was an opportunity to test out the new government's attitude to the unions and to fight against the government's price control policy which had recently

---

[19] 'Boletim DIEESE', maio 1985.

[20] 'Isto é', 17/04/85.

[21] One week before the strike in the ABC and the other 5 cities 21 other unions in 24 cities of the State of São Paulo, afilliated to the Federation of Metalworkers of the State of São Paulo went on strike but called a halt after only one day, after criticisms that they were undermining the democratic project. (Boletim DIEESE, May/85)

allowed for price increases by component suppliers but not by producers of finished cars.

In one of the five cities that started the strike alongside the ABC, (São José dos Campos), the General Motors factory was occupied by the workers in protest against the sacking of 93 workers, including union executives and Factory Committee members. Police were called in with dogs, teargas and machine guns and the workers put up barricades to prevent them storming the factory. Eventually the workers left the plant and GM closed it for a week.[22]

Worries about disturbances to the national democratic project continued: but so did the strike in most of the companies. The unity of FIESP began to break up as some companies started to negotiate separately. After three weeks of the strike, 98 companies (55 of them in São Bernardo) had agreed to reduce weekly working hours from 48 to 40 and others were negotiating a reduction to 44 or 42 hours. These companies had also agreed to three-monthly adjustments to wages. The proportion of workers benefitting from these agreements was 81% in Santo André and 65% in São José dos Campos where General Motors, Hitachi and Bundy took a harder line.[23] However, the big employers, particularly the car companies, held together, refused any concessions, and also held meetings with the smaller components companies to prevent further divisions amongst employers. In the first two weeks of the strike, car workers were allowed into the factories but could not work properly because of the lack of components. The real strike in the car companies in Sao Bernardo (Volkswagen, Ford, Mercedes Benz and Scania) started some 2 to 5 weeks

---

[22] International Labour Reports, May 1986.

[23] 'Isto é', 01 and 08/05/85.

after the 'wild cow' operation began.

The car companies argued that they were not able to concede the workers demands because of government price control policies. The Minister of Labour suggested that the companies make concessions out of their profits, but the president of the auto vehicle manufacturers' association (SINFAVEA), who was also the president of General Motors, was reported as stating that 'the reduction of working time alone represents an increase of 22% in the total cost of the product'.[24] The Sao Bernardo union argued, and presented evidence, that the concession of three monthly adjustments plus the reduction of working time to 40 hours per week and a 5% increase in wages based on productivity increases resulted in only a 3.49% rise in the cost of cars, and also created more jobs. In the light of this new evidence the union agreed to accept that an increase in costs could be passed on to the price of the product and proposed a deal to the employers on this basis. In the motor industry in the ABC area the 'wild cow' operation lasted about 28 days.[25]

In Ford São Bernardo the 'wild cow' operation began to affect production at the end of the second week. Production continued for three more weeks, but vehicles with components missing filled the factory's parking-lots. Between the 20th and the 23rd of May Ford workers actually went on strike stopping every activity in the site. The 'wild cow' operation affected the production of the Escort more than that of other car models because Ford depended more on its supliers for the former. The implications of

---

[24] 'Isto é', 08/05/85.

[25] 'FSP', 09/05/85. The whole 'wild cow' operation, however, lasted over 5 weeks.

this strike can be illustrated by developments at Ford. Two days before the union presented its last proposal to FIESP, Ford lacked 378 batteries, 234 sidelamps and 146 anti-noise suspensions besides brakes and other components for Escort production. On that day, according to the Factory Committee, there were 500 Escorts in the site garage without brakes and it was estimated that 1½ hours would be necessary to fit brakes to each of the cars, a total of 750 working hours for the cars in the garage [26]. These numbers were still relatively small but the disruption caused by the still limited strike action was severely disturbing to management.

One week after the 'wild cow' operation started, the president of Ford-Brasil, Mr. R. M. Gerrity, was replaced and called back to the United States. On his return he declared at a press conference that 'without the metalworkers organization, as it is today, it would hardly have been possible for Ford to achieve the productivity and quality levels that have allowed it to sell cars in Europe ...' He also reported that '... the cost of labour is not a problem in Brazil where a worker earns US$ 3 per hour compared to US$ 28 in the USA'.[27]

The effects of the strike extended into Ford's worldwide operations. At the end of April Ford claimed that they had lost exports of 2,500 Escorts to Scandinavia (or US$ 12,5 million) due to the strike. Engines produced by Ford in Taubaté are fitted in the Merkur (a luxury version of the Sierra) which is produced in Cologne (West Germany) and exported to the USA. Because of the strike in Brazil production was delayed and the engines could not be shipped

---

[26] 'FSP', 09/05/85.

[27] 'Gazeta Mercantil', 17/05/85.

to West Germany. As a result, in the first two weeks of May 1985, Ford had to send by plane 972 engines to Cologne spending 11 times more in transport costs per unit than it would otherwise have done.[28]

Ford was not the only car company to make losses, but this was the first strike in which the car companies alleged that their export markets were affected.

In December 1985 another industrial dispute occurred in São Bernardo arising from workers' demands for an emergency payment of a supplementary month's wage to restore living standards, eroded by the rampant inflation, and for the introduction of the 'professional wage'. Stoppages started in four big companies (Massey Perkins, Mercedes Benz, Ford and Saab Scania) and extended to other companies in the area.[29] The car companies compromised by offering to anticipate wage adjustments and introduce a unified wage structure from August 1986.[30]

Thus, in the period from 1983 to 1985, Ford's new industrial relations system, which had been emerging over the previous five years, was consolidated in the context of big changes at the levels of the industry, the unions and the State.

At the level of the company, Ford, was integrating its Brazilian subsidiary into its international production strategy and, in São Bernardo, introducing new production

---

[28] 'Gazeta Mercantil', 15/05/85.

[29] 'Boletim DIEESE', Jan/86.

[30] 'FSP', 14/12/85. A detailed discussion about the 'professional wage' claim and the implementation of the unified wage structure will be discussed in Chapter 9.

process. New training was undertaken, and there was much cooperation from the workforce in the introduction of the new technology. At the same time, the company was negotiating conditions of employment with the newly constituted Factory Committee under new procedures. Examples include the company's offer of redundancy schemes and the deal about a period of stability of employment in exchange for a no-strike agreement. The latter in particular seems to have been directly conditioned by the integration of the São Bernardo plant into the international production strategy, both because of the heightened risks that industrial disputes would affect international production, and because the hire and fire system was seen to be no longer suitable for the requirements of new production processes.

At the level of the car industry as a whole, government policies also affected production strategies. The policy of market reserve for information technology conditioned the speed of technical innovations through state control of imports of new technology. The success of the Alcohol Programme led to increased production of alcohol fueled vehicles, which rewarded previous investments in product development for alcohol engines and other related components. Exports were increased by new incentives. The main complaints of business were against the government's price control policy and a lack of support to companies resisting workers' demands. As far as the companies were concerned, the issues were related. If the State could not control workers demands it should not control car prices. In dealing with these problems the industry showed a considerable cohesion among employers. A similar unity was evident in industrial relations matters, such as the joint offer of a unified wage structure.

Ford-Brasil however, remained distinctive in its industrial relations system from the time of its offer of a deal on stability of employment to the unions. This proposal was rejected by the unions, and was also unwelcome to FIESP which was publicly opposed to Ford's no-strike deal. Shortly afterwards, the parent company recalled Ford-Brasil's president to the United States possibly because these proposals went too far. Gerrity's freedom of decision-making in industrial relations matters of this kind proved to be very limited.

At the level of the trade unions considerable advances were made in workers' organization. At the shopfloor level, new forms of industrial action, such as the 'pop corn' and 'wild cow' strategies, were developed appropriate to the new production processes. These affected the whole car and components industry, as well as Ford. New demands were raised such as the 'professional wage' and reduction in working hours, and much was achieved, both at industry and national level. These advances took place alongside the growing campaign for direct elections which culminated in the military withdrawal after 21 years in power. The Workers Confederations, CUT and CONCLAT, were legalized. However, the fragility of the new democracy posed serious tactical problems for the workers' movement, and political advances were not matched by new economic strategies suited both to the economic condition of the country and the structure of power in the New Republic.

2. 1986: failures of the democratic project.

Brazilian economic growth in 1985 had been exceptional. The country generated the third biggest export surplus in the

world of US$ 12,8 billion.[31] But other more negative indicators also rose exceptionally too. Inflation in 1985 was 235%, the foreign debt ammounted US$ 110 billion and more than 600 strikes were recorded. Major political advances towards democracy at the national level and in industrial relations had been institutionalized in the previous years, but structural contradictions, such as a very unequal income distribution, between social groups and regions, remained.

Ford continued to implement its new employment practices. In January 1986 it offered 120 voluntary redundancies to workers on conditions that 80 of the redundancies would be amongst inspectors, mechanics and electrical maintenance workers, crane operators and 'data collectors',[32] and the other 40 would be from workers over 50 years old with 16 years of service. The Factory Committee was notified about the redundancies, but negotiations were not held because the redundancies were voluntary.

In January 1986 the car manufacturers initiated a new strategy against the government's price control policy. This consisted of refusing to deliver cars to dealers until the authorization of price increases. Customers were forced to wait to 20 to 120 days to receive their car, and dealers complained of receiving only 40% of normal deliveries. It was reported that Ford was holding 6 to 7 thousand cars in stock, for the domestic market, compared with its usual 750 or less.

A price control system was a major element of the new

---

[31] 'Financial Times', 07/04/86.

[32] These are called 'conferentes' in Portuguese.

government's anti-inflation policy. The Finance minister sent auditors into Volkswagen, General Motors, Ford, Mercedes Benz and Saab Scania. Ford alleged that they were holding the cars in stock due to lack of components. GM said the same and claimed that they had not yet got production back to normal after the recent stoppages. Volkswagen claimed that the high level of stock was partly a result of rejections by its quality control and partly a result of stocks held for export. An increase in price was finally authorized but the cars in stock were ordered to be sold at the previous prices.[33]

Because this price rise was 7% less than the one that they had demanded, the car companies reduced their production for the domestic market. Workers reported that workpace had slowed down, and consumers in waiting lists for new cars had to wait 2 to 3 months. Prices of second hand cars increased above the prices of new ones. The president of ANFAVEA declared that companies had the right 'not to sell what makes losses'. The president of the Employers Components Industry association complained that car companies were canceling existing orders, and some components companies were obliged to lay off workers.[34] This tactic of reduced production for the domestic market as a means of pressure against government price controls continued for a long time.

The Cruzado Plan, which was announced on the 27th February 1986, was an attempt to introduce greater economic and

---

[33] 'DGABC', 07/01/86, 28/01/86, 29/01/86 and 04/02/86.

[34] 'FSP', 29 and 30/01/86.

political stability.[35] It aimed explicitly to reduce, or eliminate, inflation through desindexation and price freeze. Prices of goods and services were to be frozen, but not interest rates. High inflation had led to much financial speculation and easy gains and a large part of bank profits were arising from inflation. Actually, inflation was the expression of the state's lack of control over both the domestic national accounts (large emissions of money were undertaken to save state companies from bankruptcy) and the external debt. These policies however were not to be changed by the Cruzado Plan itself. It did not aim to change the model of economic growth. Rather, the recovery of production and investment were seen as necessary for a resumption of economic growth along existing lines.

On the question of wages and salaries, the Plan proposed to eliminate the effects of inflation and maintain the purchasing power of the working population. It proposed to do this by:

1. Existing negotiated agreements for inflation adjustments every three or six months were to be replaced by an automatic adjustment scale which would operate whenever inflation increased by 20%.

2. The minimum wage was increased from US$ 43.00 (= Cr$ 600.000,00 or £ 30.00) to US$ 58.00 (= Cz$ 800,00 or £ 40.00) per month. In 1983 22% of the Brazilian occupied population earned the minimum wage or less,[36] and there is

---

[35] For a detailed account of the reforms introduced with the 'Cruzado Plan' see DIEESE, Mar 1986a, Mar 1986b and Nov 1986.

[36] PNAD, 1983.

no evidence that this proportion changed before 1986. According to DIEESE,[35] 74% of the minimum wage established by the Cruzado Plan was necessary to feed one adult.

3. Unemployment benefit was introduced for the first time in Brazil,[36] but the restrictive conditions under which it was allowed made it more the recognition of a principle than an extensive right for the working population. The only workers who could apply for unemployment benefit were employees who had: 1. paid for Social Welfare over the last 4 years,[36] 2. had been continuously employed for the last 6 months and had now been unemployed for over 30 days, and 3. had not had any income or received any other allowance from the social welfare fund. On these conditions, unemployment benefit could be received for 4 months out of every 18 months. Only those who became unemployed after the 27th February 1986 were entitled to receive the benefit. The value of the benefit was to be not less than 70% of the minimum wage (almost enough to feed one adult) and not more than 1½ times the minimum wage (enough to feed two adults).[37]

The Cruzado Plan affected everybody's lives and provoked a variety of reactions. In the industrial sector certain

---

[35] DIEESE, Mar/1986.

[36] The monthly unemployment benefit in cruzados was to vary between Cz$ 560,00 and Cz$ 1.200,00, which in sterling value at the time would be between £ 28.00 and £ 60.00 (equivalent to £ 6.46 and £ 13.85 per week).

[36] Employees in Brazil have 8% of their monthly salary or wage deducted and employers pay another 8% of the total pay roll of the company towards the social welfare fund, the INPS (Instituto Nacional de Previdência Social).

[37] DIEESE, Mar/1986a.

economic branches contested the plan because of its effects on their profit margins. They argued that new adjustments were necessary if there was to be a price freeze. Before the Plan, contracts were agreed anticipating inflation rates, which were taken into account in the final price and timing of payment. Given the price freeze, contracts already settled had to be re-negotiated. Although the government stipulated procedures, different interpretations fitted some different economic interests better than others. For example, disputes arose between the car companies and their suppliers. The former wanted to pay for current sales as if the currency was continuing to be devalued, but the suppliers wanted to receive deliveries on the basis of the value stipulated in the contract as frozen on the 27th February, which was the government's intention.

The first major reaction from the vehicle producers came just after the Plan when Mercedes Benz, in São Bernardo, refused to receive 150 cargoes of components and decided to lay off 4,500 employees for 10 days. This resulted in great disagreements between the car industry association, ANFAVEA, and the employers association for the Paint and Enamel Industry, the association for the Machinery Industry and other associations which claimed that such disruption damaged their own deals with their own suppliers in sectors such as foundries, metals, machining, tyres, rubber, leather, steel, oil, glass, etc.[38]

The government threatened to intervene if the industrial sectors could not resolve their disagreement internally. The Ministry of Labour got Mercedes Benz to suspend the lay offs and reassured the unions that dismissals would not happen as a result of the Cruzado Plan. The bargaining

---

[38] 'FSP', 09 and 25/03/86.

power of the car industry proved to be very great and they succeeded in forcing down their supliers prices.

For the population in general, the Plan raised hopes that more than two decades of high inflation would be controlled. Optimism and a sense of nationalism, with populist elements and echoes of a 'cult of authority', were mobilized through the possibility the Plan offered to instigate a major transformation drawing on the popular desires to participate. Citizens were mobilized to be Sarney's inspectors, auditing prices and watching over for the success of the Cruzado. Yet, social inequalities were not touched by the Plan and workers demands, which had been achieving significant gains before the Plan, were now frozen for at least one year.

A belief that the freeze on goods and services would magically change the economy and the quality of life was widespread. To be against the freeze in prices and wages was to become a public enemy. The failure of the Cruzado plan would lead to the return of military coups. Popular participation had some similarities with the 1984 campaign for direct elections in which Tancredo Neves was transformed by the leading parties into a national political leader which he never actually was, except when he was the lost hope, ill in the hospital or dead. Sarney was a sort of illegitimate ruler seeking popular support through the Cruzado Plan. New hopes restored Sarney popular support. But very soon special measures to allow price increases were taken in face of pressures from powerful interests, and punishment for illegal price rises affected smaller producers and vendors much more than big ones. Gradually the Plan began to fail.

The Cruzado Plan became the centre of all attention but the

old problems of industrial relations persisted.

In the first five months of 1986 the car industry had an astonishing increase in demand. 470,000 new cars were sold (46% more than in the same period of the previous year) and more could have been sold but for a lack of production capacity. The production level in 1980 was almost equalled. By the beginning of July the major producers were developing new investment plans. Fiat, in the state of Minas Gerais, planned to invest US$ 450 million by 1988 and proposed to introduce a new working shift. Volkswagen began to build a new factory. General Motors planned to invest a further US$ 150 million. Ford however announced no new investment plans.

One study estimated that net profits made on each car sold at this time in domestic markets varied between 17% and 22%.[39] However, the international market was even more profitable. Ford's marketing director announced that '...the external market is an absolute priority... we do not hesitate to take cars out of the domestic market to sell abroad. The devaluation of the dollar (and therefore the cruzado) gives a good opportunity to compete with the Japanese with cars made in Brazil'.[40]

There was no strike during the April 1986 pay claim of the metalworkers of São Bernardo. Agreement was reached through the Labour Court, in the spirit of the Cruzado Plan. According to the unions, employers concessions were less than they had become used to and three important rights were withdrawn from workers: the provision of drinking

---

[39] Source: Document from the trade union SBC in DIEESE, Sep.1986.

[40] 'Veja' 11/06/86.

water on the shopfloor, the direct collection of union dues from workers' pay packets, and a decrease in overtime rates from double-time to time-and-a-half.[41]

In July 1986 there were major industrial disputes at Ford São Bernardo over the overtime issue and the role of the Factory Committee. The company wanted overtime work and the Factory Committee agreed. Ford organized transport for the workers and provided canteen facilities. However, only 25% of the workers that they required for overtime appeared for work and the company made losses. Management then put pressure on individual workers to do overtime by calling them in, one at a time, for private talks. Management reminded workers that they could lose their jobs if they did not conform to the company's requirements.

In July the Factory Committee organized a picket line against what it considered to be an intimidatory method of getting workers to cooperate. A worker tried to cross the picket line and was stopped by a member of the Factory Committee. Physical aggression was alleged and the Factory committee member was suspended for 30 days. An internal inquiry was held but none of 15 witnesses reported having seen any aggression by any member of the Factory Committee. The 11,000 workers on the site went on strike to defend the Factory Committee and the union appealed to the Labour Court. But three days later Ford sacked 94 workers on the grounds of 'just cause'. In such cases workers have no rights to any financial compensation. The police were called to prevent mass meetings at the factory gates and the union loudspeaker system was confiscated. The striking workers demanded the reinstatement of all sacked workers,

---

[41] Source: Document prepared by Ford's Factory Committee, n.d.

cessation of management intimidation of workers, extension of Factory Committee rights (notably in relation to access to information about the Employee Involvement programme), and a 20% wage increase.

Finally, on the 22nd July the 26 members of the Factory Committee were suspended and charged with serious disciplinary faults and a total of 204 workers were sacked for 'just cause'. The strike ended on the 25th July. From then on neither the union nor the Factory Committee members were allowed to communicate with workers in the factory. The Factory Committee, which had existed for 5 ½ years, was effectively terminated, and, although after sustained union pressure Ford eventually paid compensation to 157 of the 204 workers dismissed, the workers were not reinstated.[42]

Working conditions worsened after the suspension of the Factory Committee. Line speeds were increased in the morning so that production would not be hindered by possible disruptions later in the day. One example is the respot line whose speed was increased from 1 minute and 15 seconds to 48 seconds.[43] The 10 minute 'washing up time' before lunch and at the end of the shift was eliminated and sick notes signed by trade union doctors [44] were no longer accepted by the company. Many workers were extremely dissatisfied about these conditions and many demanded to be sacked so as to receive redundancy pay, since, in the context of increased car production in the region it was not difficult to get another job at that time.

---

[42] 'FSP', 16/10/86.

[43] Source Sub-seção DIEESE, Metalúrgicos, SBC.

[44] In the absence of any welfare state in Brazil, trade unions have their own doctors, dentists, etc.

In mid October 1986 105 cars were damaged inside the plant or were found with incorrect components fitted. The Factory Committee had always insisted that workers should not damage vehicles but on the 15th October Ford called a press conference and accused the suspended Factory Committee and CUT of being responsible. The governor of the State of São Paulo, the ministers of labour and finance, the federal police chief, and the president of ANFAVEA, all called the sabotage a 'criminal act'. The P.T. (Workers' Party) candidate in the coming gubernatorial election argued that it was necessary to look at workers' motives for such an action. The Metalworkers of São Bernardo, the CUT, and P.T. were criticized and blamed for the 'vandalism in Ford'. Ford claimed that the sabotage was the work of isolated groups interested in spoiling the good working relations in the factory and called in the police to identify those responsible.[45]

The Factory Committee argued that this event was proof that Ford workers were militant and prepared to take industrial action and that disputes had not been provoked by the Factory Committee. The company, however, alledged that the event proved that the Factory Committee had been damaging industrial relations since it believed that the sabotage had been organized by the suspended Factory Committee members.[46]

Ford's suspension of the Factory Committe was at first seen by the union and the Factory Committee as a tactical move in the implementation of the Employee Involvement programme, whose introduction the Committee had resisted

---

[45] 'FSP and 'O ESP' 16 and 18/10/86.

[46] Both Factory Committee and management views were expressed in interviews carried out in January 1987.

since mid 1984. In a Latin American Conference of Ford workers organized by São Bernardo's Factory Committee in January 1986, Employee Involvement was heavly criticized as a managerial strategy to make workers docile so as to implement Japanese industrial relations techniques in the factory. However, in the last months of 1986 the merger of Ford and Volkswagen operations in Brazil and Argentina was announced shedding new light on management's industrial relations strategies, as the following accounts illustrate.

In face of the merger, the main fear of the Metalworkers Union of São Bernardo has related to unemployment. How will attempts to reduce costs affect labour? Economies of scale in production, research and development, finance, suppliers, will reduce employment. Increasing efficiency will affect manning levels and the workpace. The Union of São Bernardo has defended the workers right to know about agreements of this kind. Once again they were not heard, having been informed about the merger of Ford-VW by the press.

Just six weeks before the agreement between the companies was made public the union of São Bernardo had issued a report analysing Volkswagen's suggestion that it would close its Brazilian subsidiary as a result of the government's price control policy and alledged recent losses.[47] The union report pointed out that Volkswagen had made huge profits in Brazil and that working hours in its Brazilian subsidiary were much greater than in any other VW site worldwide.

The way the merger was presented to the government

[47] 'Jornal da Tarde', 06/10/1986, on the VW's claim.

foreshadows political and economic pressure from the two multinationals in order to win more benefits and to press for economic changes. The Autolatina is to be the 11th biggest car company in the world.

Workers were very concerned about the deal and Ford workers in particular feared that Volkswagen's harder line on industrial relations would be extended to the whole of the new company. The suspended Ford Factory Committee was asked 'off the record' by Volkswagen management to cease putting pressure on Ford until July 1987 when the managerial reorganization would be complete. In the opinion of the union, the suspension of the Factory Committee in July, when the merger was rumoured to be under discussion, was part of the deal. Volkswagen would certainly not welcome taking on the existing organization of Ford workers since it had much closer control of its own very different System of Employee Representation.

1986 saw major changes in Ford's industrial relations and the prospects for its future business strategies. The Factory Committee's indefinite suspension indicated the underlying weakness of the new pattern of industrial relations which had been developing at Ford. Ford's action was eased by the lack of institutionalized democratic rights for the unions at the national level. The changes in labour laws in the years before had not in practice modified the power structure and workers could not rely only on their organizational power, and risked to losing gains whenever employers chose to withdraw concessions. Slow changes in Brazilian labour legislation continued to occur, however. In July 1986 a new strike law was passed by Congress amending the 1964 law. The prohibition of strike action by bank workers was withdrawn. Union mass meetings to vote on strike action in secret ballots could now be

chaired by any union member rather than by a Ministry of Labour official as had previously been the case, and be held 5 days before taking action instead of the previous 10 days required. Employers had to be given five days notice of strikes, but penalties for illegal strikes were reduced from the previous penalties of 6 months to 1 year imprisonment to warnings or dismissals. The attitude of the Ministry of Labour was reported to be that 'It is not worth having a rigorous law that will be constantly violated'.[48] However, it should be noted that changes in labour legislation continued to lag far behind existing industrial relations practices. The procedures for strikes in the 1964 law had not been followed since 1978 and the strike law had been almost invariabily violated.

The relationship between the car industry and the New Republic has been difficult because of the greater pressures from the industry to break up price control policies including the price freeze that accompanied the Cruzado Plan. The companies' shift towards increasing the export share of production also increased popular discontent with the government. These conflicts grew harder to reconcile as they became more intense in the context of new economic policies to control inflation.

3. Debt, multinationals, democracy and industrial relations

No simple direct link can be traced between technological change and labour organization because the events, described at company, or national level, are part of more general processes in which the production process is not the key determinant. Some of the changes were determined by

---

[48] 'Veja', 30/07/86.

modifications in the production process. But others were determined by economic recession or the general popular struggles for democracy. The link between these variables is their common historical moment and the shared context of Brazilian social conditions.

In Ford, workers' organization developed in tandem with that of the 'categoria'. Shopfloor organization at Ford strengthened the bargaing process at the 'categoria' level in the same way that the latter supported the achievements of the Factory Committee. The Factory Committee appeared in 1982 as an element in Ford's more liberal approach towards union organization. The company's proposal in 1985 for stability of employment in exchange for a no-strike deal was also in some respects an advance in terms of the general pattern of industrial relations in Brazilian industry. But although these innovations could be viewed as a sign of independence vis à vis broader employer policies, it is important to bear in mind that the more conservative Volkswagen also broke from the employers' mainstream, when it offered its System of Employee Representation. The continuing suspension of Ford's Factory Committee after five years of existence contradicts the notion that Ford has been basically more liberal and independent. Its distinctive openness corresponds to the time of the military regime. Also, when a more liberal and independent approach was taken by the subsidiary's president the American intervention became stronger. Therefore, more and more, Ford's approach to industrial relations since 1984 has been very much in line with the approach of the car industry as a whole, and the car industry itself has not been very different from the pattern prevailing in the country.

The rise of trade union strength lasted from 1978 to 1984.

During this period labour legislation was contested and new practices overcame previous constraints. Strikes took place, direct negotiations became the normal way of settling conditions of employment, shopfloor organization became established in various companies, and inter union contacts were permitted. These changes resulted from workers' struggles which enjoyed popular support and which linked themselves to opposition to the military regime. But, although some practices changed, the legal framework for collective bargaining, and the basic conditions of employment have not changed. The official trade union structure remained in the mould that it inherited from Italian fascism. The two central confederations, CUT and CONCLAT, were incorporated without dismantling the previous structure and power configuration. The new exists in parallel to the preserved old structures.

In 1985 a civilian government took power beginning the period of the 'New Republic'. Paradoxically, however, despite the aims of a democratic project and the impetus of the late 1970s, in which the strikes of May 1978 were the most important feature, the power of the labour movement began to weaken under the new regime. Significant defeats occurred, such as the suspension of the Ford Factory Committee, and wages were frozen while prices rose under the 'Cruzado Plan'. Moreover, workers participation in decision making processes, either in the companies they work for or in the government, did not change. New forms of control were institutionalized by the use of the old legal system and power arrangements.

The 'New Republic' has considerable continuity from the old

regime and remains authoritarian.[49] It is a 'mélange' of political forces that unites struggling traditional interests in opposition to rising new powers. Hence there is there no serious attempt to change the structure of trade unions and workers participation continues to be excluded.

The modern industrial sector is not interested in changing the political regime. The changes in economic policies during this period have not been incompatible with the sector's profitability. The two government measures that required most adjustment by the car industry, for instance, were the programme for alcohol fuelled vehicles for the domestic market, and the market reserve for information technology. The first was not incompatible with the car industry's search for alternative fuel sources worldwide and Brazil provided a site for extensive experiments. Information technology policies may have affected production methods, but they have not had direct negative effects on the sector's profitability. The major complaints from the car industry are directed against price control policies. But generous export incentives provide an attractive alternative for profit making.

The 'Cruzado Plan' was intended to be a major instrument in the democratic project. But it was restricted to the control of inflation, and did not link economics to politics. The political power of the state was used to a considerable degree in controlling prices. But, the control was directed only at items of popular consumption and other prices remained uncontrolled because of the structure of power that continued to support economic privileges.

---

[49] This relationship between the old and new structures in relation to the Cruzado Plan is brilliantly discussed by Oliveira in 'FSP' 1986.

A good illustration of the balance of power in the present economic structure is the tricks of the car industry to increase vehicle prices while avoiding confrontation with the government's price freeze policy. A document prepared by the Metalworkers union of São Bernardo [50] shows that Ford increased car prices by between 14.4% for the Escort L and 38.1% for the Escort XR3 during the first 6 months of the 'Cruzado Plan'. Ford, like other car companies,[51] did this by sending cars to dealers without certain accessories such as laminated glass windshields, head supports on the seats, or boot covers. Customers had to pay extra for such accessories which were really basic components of the car before the 'Cruzado Plan'. There was no punishment for the companies other than public criticism, especially since customer waiting lists to buy a new car were full for the next 6 months and the car companies in any case preferred to pursue higher profit by increasing the proportion of cars exported. The government too wanted more expots in order to reduce the foreign debt. Tied up domestically by the national power structure and externally by its economic needs, the 'Cruzado Plan' ended up a failure.[52]

The social structure in Brazil has always been very unequal. It has remained as such thanks to an economic

---

[50] Sub-seção DIEESE, Set/1986.

[51] 'O ESP' 07/09/86.

[52] The last government measure to try to save the economic plan, named 'Cruzado II' was extremely unpopular. Amongst other items, it increased prices of cars and fuel. The new version of the 'Cruzado' was announced one week after the November 1986 elections for state governors, in which the political party of President Sarney had only won in one of the 22 Brazilian States, and the PMDB, political party supporter of the 'Cruzado Plan', had won in the remaining 21 States.

dynamics that have allowed a certain social mobility. For the deprived part of the population, mobility of some workers linked to the subsistence sector of the economy helped to provide for basic needs. For the more privileged part of the population, mobility depended on economic growth in the formal sector which has been sustained through injections of foreign capital. Nowadays more people are dependent on the fate of capitalist accumulation than ever before because the subsistence sector has shrunk. At the same time the foreign debt has never exerted such a great pressure.

In Brazilian history the inflation crisis developed out of the style of industrialization initiated in the mid 1950's, based on imports of technology and know-how from the developed countries. This external dependency, continuously worsened by the expansion of imports, created an uneven internal development process which benefited some of the population in some regions, but excluded other regions and groups of people. In the 1960s, the state attempted to meet rising popular demands by printing more currency thus accelerating inflation. The inability of these governments to handle popular demands made them vulnerable to the 1964 military coup d'Etat,[53] in which the continuing inflationary crisis was 'resolved' by means of military repression of popular demands.

Foreign creditors have required policies focused on export incentives, to increase the profitability of sectors linked to multinationals, and containment of the internal debt by controlling inflation rates. Brazil may have to pay a heavy

---

[53] For wider interpretations of the relationship between authoritarian regimes in Latin America and problems of accumulation, see: Singer, P., 1985 and Furtado, A., 1985.

social price for attending to the demands of its foreign investors such as continuing low wages, the exclusion of workers from politics and companies affairs, continuing high levels of illiteracy, and the persistence of very great social inequalities.

I have quoted the statement of the former president of Ford-Brasil that without the metalworkers of São Bernardo being organized it would have been impossible to export to Europe. In this case, political organization and political concessions seem to go in line with good economic achievements. In the two factories studied there have been many moves towards increasing workers participation at shopfloor level. This does not necessarily imply democratization: it can be new forms to reproduce old structures. It is still difficult to assess the significance. Certainly, however, flexibility, efficiency and quality have been linked with changes in forms of relationship between management and workers, at both Dagenham and São Bernardo. This issue is considered in more detail in the next chapter.

Chapter 9

FLEXIBILITY, QUALITY AND EFFICIENCY: THE ROLE OF JOB STRUCTURES AND EMPLOYEE INVOLVEMENT

The last three chapters showed that the different industrial relations systems at Dagenham and São Bernardo related to distinctive strategies of labour management in the context of different patterns of technological change, job cuts and workplace control. The strategies at the level of the subsidiaries related to the national industrial relations systems and national politics (including trade union involvement in politics), and to special features of the national and local labour markets.

In this chapter we are concerned with the more recent paths followed by Ford management in each country, implementing policies designed for the new approach to labour relations required by the present pattern of international competition.

Labour flexibility is widely preconized in the industry as essential to quality and efficiency in production. However, as Chapter 5 showed, although the ideal combination of equipment permits the highest output level, the determinants of how that equipment is operated go far beyond technical issues. This is why in some cases it becomes disadvantageous to implement equivalent technological modernization in order to achieve the same, or even better, product quality. Moreover, prescriptions about the best sort of flexible work organization have to be adapted to each different national and plant context.

What is required and what can be implemented varies.[1]

Similar managerial problems arise from different historical patterns of work organization and labour relations. Production management faces distinct problems because of the diverse combination of technology and differences in the intensity of labour at the two sites. In both sites since the late 1970s the pattern of employment shifted towards more use of skilled workers, and labour turnover rates declined. But these common trends arose from very dissimilar industrial relations policies. Both plant managements wanted to secure flexibility, efficiency, quality and improved competitiveness. But at Dagenham, management's attention was mainly focused on changes in the job structure. At São Bernardo management concentrated mainly on Employee Involvement to secure its goals.

The structure of this chapter is as follows:

1. The first two sections cover policies concerning employment levels, the composition of the workforce and labour turnover in the 1970s and 1980s. Dagenham and São Bernardo share a certain common 'stabilization' of employment linked to quality and efficiency demands. But whereas in Dagenham this occurs in the context of massive reductions of the workforce, in São Bernardo employment levels have been relatively stable.

2. The third, fourth and fifth sections deal with the

---

[1] Different experiences of flexibility in recent years in Europe, the United States and Japan, are discussed in: 1. Boyer (ed), 1986, which analyses France, U.K., Ireland, Spain, Belgium, Italy, and West Germany; 2. Tolliday and Zeitlin (ed) 1986, on U.S., Italy, Japan, U.K. and West Germany; 3. Streeck (ed), 1985, on Italy, U.K., and West Germany; and 4. Katz, 1985, on the U.S.

different priorities of management in the two subsidiaries. At Dagenham the wage/job structure is the key issue, with Employee Involvement being relegated to a second stage. At São Bernardo the pre-existing flexibility on the shopfloor has allowed a direct move to Employee Involvement developments.

3. In the final section changes in employment levels and policies for the reform of wage and job structures are discussed in the context of the 'flexibility' they provide and the different priority of issues for management in Brazil and Britain.

1. Employment levels and workforce composition in the 1970s and 1980s

Employment levels fell 39% in Stamping/Body Assembly and 30% in Paint/Trim and Final Assembly at Dagenham between 1977 and 1985. The decreases have been sharpest since 1982 (Table 9.1, Lines N= and Indices. For further details see Table 9.5). Unlike Dagenham, employment at São Bernardo has not decreased continuously since the late 1970s. In all the operations of Ford-Brasil employment reached their lowest levels in 1977 and 1982 (See Table 9.7), because of economic recessions. The recovery from 1978 to 1980 was possible because of domestic market expansion: the recovery after 1982 was based on increasing exports.

Table 9.1
Distribution of the workforce by grade and area, 1977 to 1985, Dagenham Stamping/Body Assembly (St/Ba), and Paint, Trim/Final Assembly (P,T/Fa) (1)

Grade (2)	1977		1980		1982		1985	
	St/Ba %	P,T/Fa %	St/Ba %	P,T/Fa %	St/Ba %	P,T/Fa %	St/Ba %	P,T/Fa %
1	0.8	1.2	1.0	1.7	0.5	1.7	0.1	1.7
2	48.0	60.0	44.7	51.7	38.2	52.7	26.6	43.7
3	29.5	27.5	32.9	34.5	31.5	37.7	33.0	44.3
4	3.5	2.1	3.6	2.6	5.6	2.7	8.4	4.1
5	16.1	3.7	15.8	4.5	20.9	5.0	30.1	6.2
Fem.	0.3	5.2	0.2	4.8	0.1	0.1	(*)	(*)
App.	1.9	0.1	1.7	0.1	3.3	-	1.7	-
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N=	6,069	5,245	5,497	5,057	5,254	4,776	3,711	3,669
Indices	100	100	90.6	96.4	86.6	91.1	61.1	69.9

(1) Does not include Trim Manufacture.
(2) Grades 1, 2, 3, 4 and 5 refer to male workers, except in 1985.
(*) Female workers included in the grades.

Source: Ford-Britain, Headcount analysis, Dagenham.

As Table 9.1 shows, the workforce as a whole was upgraded at Dagenham.[2] The proportion of lower paid workers (grades 1 and 2) decreased from 1977 to 1985. The reduction in the proportion of workers in grade 2 was particularly great after 1982 and mainly altered the employment structure in the Stamping and Body Assembly area. There was also a big

[2] Manpower statistics available have consistently added the Paint shop and the shopfloor of Trim and Final Assembly. Thus, almost all the data in this Chapter will refer to these two areas as one.

increase in the proportion of workers in the highest wage level (grade 5) in Stamping and Body Assembly. This proportion almost doubled from 1977 to 1985, increasing particularly sharply after 1982, when the robots were introduced. Also, the relative proportion of apprentices rose significantly from 1977 to 1982, particularly in the area of Stamping and Body Assembly. The proportion of workers in grade 3 in the Paint, Trim and Final Assembly increased corresponding to the decline in the proportion of grade 2 workers. These changes in the distribution of the workforce within manufacturing areas are related to different levels of technological modernization and reflect new employment policies. The Body Construction area, which is discussed in detail in Chapter 5, has had the greatest technological modernization in the Dagenham site. This is a further indication of the greater use of more skilled workers in areas with higher automation.

As Tables 9.2 and 9.3 show, wage levels in the two subsidiaries are enormously different. The highest wage paid to a hourly worker at São Bernardo is lower than the lowest wage paid to a hourly worker at Dagenham.

The wage structure in São Bernardo has 12 grades (Table 9.3) eleven of which are represented in the three manufacturing areas considered here - Body Construction, Paint, Trim and Final Assembly. These grades fit 103 job titles in these areas, which are distributed into four skill categories. Unskilled jobs (Grades 3 and 4) represent 3% of the workers in the site. As in Dagenham, a relatively higher proportion of them are employed in the Paint, Trim and Final Assembly area. Semi-skilled jobs (Grades 6, 7 and 8) amount to 64.4% of the workers on the site. There is a relatively higher proportion of semi-skilled workers in the Paint, Trim and Final Assembly areas. Skilled jobs (Grades

9, 10 and 11) represent 25.5% of the workforce on the site. Again, a relatively higher proportion of skilled workers are in the Paint, Trim and Final Assembly area. Ford-Brasil also classifies workers as 'highly skilled'. These are craft workers with further specializations within the whole range of skills. The highly skilled jobs, in grades 12, 13 and 14 are mostly concentrated in the area of Stamping and Body Assembly. Hence, the highest wages are paid to Body Assembly workers. This is also the case at Dagenham. But, unlike Dagenham, there is a more even distribution of apprentices across manufacturing areas at São Bernardo.

Table 9.2
Hourly paid wage structure (grades and rates) by areas in Dagenham - November 1985

Wage grade and weekly rates (value in £)	Stamping/Body Assembly %	Paint,Trim/Final Assembly (a) %	Total (b) %
1 118.52	0.1	1.6	0.9
2 129.87	26.6	42.2	34.6
3 136.15	33.0	46.2	39.8
4 142.43	8.4	3.8	6.1
5 153.04	30.1	6.2	17.8
Apprentices	1.8	-	0.8
Total	100.0	100.0	100.0
N=	3,711	3,922	7,633

(a) Includes Trim manufacture.
(b) Total refers to the sum of both areas (Stamping and Body Assy + Paint, Trim and Final Assembly.

Source: Manpower statistics, Ford-Britain.

Table 9.3
Hourly paid wage structure (grades and rates) by areas in São Bernardo - November 1985

Wage grade and weekly rates (value in £)	Stamping/Body Assembly %	Paint,Trim/Final Assembly (a) %	Total (b) %
3 24.66 to 35.03	1.4	4.1	2.9
4 27.01 to 38.40	0.2	-	0.1
6 31.72 to 46.85	0.1	6.4	3.5
7 34.65 to 51.41	55.6	38.5	46.4
8 37.91 to 56.33	8.7	18.6	14.0
9 40.85 to 62.15	11.8	21.5	17.0
10 44.73 to 67.67	0.4	1.7	1.1
11 49.06 to 73.81	8.3	6.7	7.4
12 52.99 to 81.84	3.4	1.2	2.2
13 57.90 to 88.81	1.1	0.5	0.8
14 62.96 to 96.86	8.2	-	3.8
Apprentices	0.6	0.6	0.6
Total	100.0	100.0	100.0
N=	2,785	3,195	5,980

(a) Includes Trim manufacture. (b) Total refers to the sum of both areas (Stamping and Body Assy + Paint, Trim and Final Assy).

Source: 'Relação de funcionários horistas', Ford-Brasil.

Both at Dagenham and São Bernardo, Body Construction, the area in which most automation was introduced, has seen the biggest changes in composition and level of employment. Carvalho, and Gitahy, argue on the basis of two case-studies of car firms in São Bernardo, that technological innovation in Body Construction has changed the composition of skills and employment levels. They emphasize the replacement of 'socially recognized skills' by new skills

directed towards a re-composition of the working class.[3] Unfortunately data to compare trends in employment levels and skills in the São Bernardo manufacturing areas were not available, making it impossible to carry out further analysis of employment composition on the lines of the Dagenham case.

The range of wages across the grade structure in Dagenham, from the bottom (grade 1) to the top (grade 5), is 29% (See Table 9.2). In São Bernardo, the equivalent difference is 229%.[4] In addition to this greater wage differentiation, the wage structure itself is different. In São Bernardo there are five wage steps within each grade. The steps aim to offer a promotion ladder within the grades. One result is overlapping wage levels with the top of each grade always being higher than the bottom of the next one. (See Table 9.3) Including grades and steps there are 55 different wage categories at São Bernardo. Excluding wage overlaps, there are about 20 wage levels.

Within São Bernardo's wage and job structure promotions are based on time spent on each job step (a form of seniority), performance assessment and the departmental budget. The model time for a worker to move from the bottom to the top of his/her wage grade is 33 months. Performance is assessed by the immediate superior, usually the area supervisor, based on an appraisal system issued by the Industrial Relations Area. Budget quotas are allocated to each department or section by the Finance Area. The number of workers to be promoted is based on the budget available,

---

[3] Carvalho, 1987; Gitahy, 1986.

[4] Zabala, 1983, p.508, shows that in the GM plant he studied in the United States, wage difference between the highest and lowest wage in 1981 was 9.8%. He also abserves that differentials had narrowed since the early 1970s.

and if the performance assessment means that a greater number of workers are qualified for promotion than Finance will permit, the supervisor has the responsibility of selecting who will be promoted.

Although promotion rules are based on these three criteria defined by the company, the labour market also plays a significant role in shaping practices. For instance, in 1985 and 1986 a tinsmith could move through the six steps of his wage grade (grade 9) in 18 to 24 months, after which he would be promoted to the 'official' or 'professional' step in the following grade. This policy of quicker promotion for tinsmiths was the pattern also followed by the other car manufacturers in the São Bernardo area in 1985-6, as a response to the relative scarcity of workers with this skill.

2. Trends and policies of labour turnover

One of the most important changes in labour policies in the two sites has concerned labour turnover which has been an important issue in both plants and particularly controversial at São Bernardo. Labour turnover rates have decreased markedly since 1980, both at Dagenham and São Bernardo, although the latter has not fallen to the same low levels as the former.

It is important to define the issue of turnover carefully. In the company's statistics terminations refer to both employees who leave the company by their own initiative and those dismissed by the company. Table 9.4 illustrates the range of reasons for terminations in the late 1970s. However, the word 'terminations' does not cover all cases in which an employee leaves the company. Thus employees

leaving under 'redundancy schemes' are not counted as terminations in the company's statistics on wastage rate or labour turnover rate. Thus employment levels can fall rapidly even while 'wastage' and 'termination' rates diminish. The wastage rate refers to terminations divided by headcount. Labour turnover rates are calculated on the basis of hirings plus terminations divided by total headcount. Thus Table 9.5 should be read in two ways. The first column indicates the gross reduction of the labour force. The figures for wastage rates and labour turnover are more 'refined' measures which indicate changes in company policy towards the part of the workforce that continues to be engaged in production.

Ford-Britain's policy towards labour turnover has gone through a major change. Discussing the general employment pattern in the 1970s in England, Marsden[8] argues that high labour turnover rates were a consequence of workers seeking better opportunities in a buoyant labour market. In these conditions management found it very difficult to retain labour and were pressed to make concessions to strategic groups of workers to retain them on the jobs. The pattern of high labour turnover in the 1970s was also shaped by the practice of lay-offs. Workers were retained only as long as demand required them to be on the job. Thus market fluctuations directly and immediately affected employment levels. Laid off workers do not receive full pay, although they remain employed. This enabled them to look for new jobs. The majority of workers in the car industry did not need much additional training to work in other engineering industries. Nor in the 1970s did most car companies require special training for most of their workforce.

---

[8] Marsden et al, 1985, Ch. 4.

Table 9.4
Reasons for termination, hourly workforce, Ford-Britain, Companywide
Tax Year 1977/78 and 1978/79

Initiative	Reason		1977/78 Nº	1977/78 %	1978/79 Nº	1978/79 %
Employee Initiative	Private life	Matrimonial difficulties	669	9.3	349	5.1
		Others	1,267	17.6	1,113	16.4
		Total	1,936	26.9	1,462	21.5
	Reasons linked to the job	Rate of pay	61	0.8	62	0.9
		Working condition	384	5.3	466	6.9
		Total	445	6.2	528	7.8
	Better opportunity in the l. market	Change to a new job	3,233	44.9	3,262	48.0
		Retirement	101	1.4	118	1.7
		Total	3,334	46.4	3,380	49.7
	Total		5,715	79.5	5,370	79.0
	Disciplinary reasons		365	5.1	361	5.3
Company Initiative	Strike		282	3.9	-	-
	Retirement		755	10.5	716	10.5
	Redundancy		5	0.1	265	3.9
	Others		71	1.0	84	1.2
	Total		1,478	20.5	1,426	21.0
Total			7,193	100.0	6.796	100.0
Others	Death		234	-	270	-
	Transfer to staff		502	-	654	-
Total			7,929	-	7,720	-
Hourly headcount (% terminations)			57,195	(13.9)	58,561	(13.2)

Source: Manpower statistics - Ford-Britain

Table 9.5
Hourly headcounts, hirings, terminations, wastage rate (1) and labour turnover (2)
Companywide and Dagenham site

Year	Companywide					Dagenham site (3)				
	Hourly headcount	Hirings	Terminations	Wastage rate	Labour turnover	Hourly headcount	Hirings	Terminations	Wastage rate	Labour turnover
1975	51,842	3,360	6,843(a)	13.2	19.7	-	-	-	-	-
1976	53,390	10,001	5,339(a)	10.0	28.7	-	-	-	-	-
1977	57,312	10,444	8,256	14.5	32.6	24,920	-	4,560	18.3	-
1978	57,195	6,751	7,929(b)	13.9	25.6	24,863	-	4,599	18.5	-
1979	58,561	-	7,720(b)	13.2	-	24,232	-	-	-	-
1980	57,423	3,170	5,436	9.5	15.0	23,056	1,492	2,902	12.6	19.1
1981	54,041	610	2,871	5.3	6.4	21,283	308	1,359	6.4	7.8
1982	50,129	348	2,268	4.5	5.2	19,674	240	1,074	5.5	6.7
1983	45,246	550	1,828	3.6	5.3	17,538	201	918	5.2	6.4
1984	41,096	551	1,104	2.7	4.3	15,139	135	451	3.0	3.9
1985	37.027	401(c)	565(c)	-	-	11,845	-	-	-	-

Dagenham site: Stamping and Body Assembly and Paint, Trim and Final Assembly

Year	Stamping and Body Assembly					Paint, Trim and Final Assembly (4)				
	Hourly headcount	Hirings	Terminations	Wastage rate	Labour turnover	Hourly headcount	Hirings	Terminations	Wastage rate	Labour turnover
1977	6,069	-	1,086	17.9	-	5,245	-	1,458	27.8	-
1978	6,165	-	1,122	18.2	-	5,210	-	1,260	24.2	-
1979	5,859	-	-	-	-	4,956	-	-	-	-
1980	5,497	453	692	12.6	20.8	5,057	481	777	15.4	24.9
1981	5,189	10	329	6.3	6.5	5,202	19	370	7.1	7.5
1982	5,254	43	320	6.1	6.9	4,776	20	321	6.7	7.1
1983	4,771	4	262	5.5	5.6	4,774	3	267	5.6	5.7
1984	4,250	-	136	3.2	-	4,098	-	137	3.3	-
1985	3,711	-	-	-	-	3,669	-	-	-	-

(1) Wastage rate = (terminations x 100) : hourly strength.
(2) Labour turnover = (hirings + terminations x 100 : hourly strength.
(3) Includes St/Ba, P,T/Fa, plus Engine, Foundry, Knocked Down, Trim manufacture (River plant) and miscellaneous.
(4) Excludes Trim manufacture (River Plant).
(a) Estimated.
(b) Refers to the tax-years 1977-78 and 1978-79.
(c) January to June.
- : Not Available
Source: Ford-Britain - Manpower statistics.

Data from Ford-Britain in the late 1970s confirm this pattern. (See Table 9.4). 80% of the terminations in 1977/8 and 1978/9 were on the employees' initiative. Over a half of employees who left were seeking better opportunities in the labour market. In addition, one-third of those who left did so for 'private life' reasons, which may have also been related to more attractive life arrangements offered by better job offers. Company initiatives in terminations accounted for only 20% of the total. Most of the reasons seem to have been related to normal procedures in employment conditions such as 'retirement' and 'redundancy'. In 1978, when a major strike occurred, 9% of the total terminations were accounted for by 'disciplinary reasons'. 'Discipline' alone accounted for about 5% of terminations in both years.

Hence, during the 1970s at Dagenham, employment levels increased with high rates of hiring. But terminations were also high, resulting in labour turnover rates usually well above 20% per year.

Since 1980 labour turnover has decreased sharply due to both a down trend in termination levels and a policy of limited hirings. The pattern at Dagenham corresponds to the companywide one. Employment levels decrease after 1979, mainly through voluntary redundancies. But the high wastage rates of the 1970s, turn downwards too in the 1980s, and labour turnover rates decrease, particularly after 1981 (See Table 9.5). For those who stay in the company, the prospects of employment stability are increased.

Unfortunately, data comparable to the breakdown of reasons for terminations in Table 9.4 is not available for the 1980s. But looking more closely at the trends of terminations and hirings in each manufacturing area permits

a more accurate account of the employment policies in these areas. (See Table 9.5) The trend for the company as a whole is repeated in the areas of Stamping/Body Assembly and Paint/Trim and Final Assembly, with variations from the general pattern reflecting specific policies related to the different areas. For example, until 1980, wastage rates were much higher in Paint, Trim and Final Assembly compared to Stamping and Body Assembly because of large numbers of terminations.(Table 9.5)

Within the various manufacturing areas changes in the proportion of workers in different grades indicate changes in the composition of the workforce (See Table 9.6). In 1980 labour turnover in wage grades 1, 2 and 5 was high, with hirings amounting to about half of terminations in each grade. Greater reductions in the number of workers occurred in grades 3 and 4. After 1980, further hirings occurred only in 1982 and 1985 for grade 5 and apprentices. Because the relative proportion of workers in grade 5 and apprentices increased sharply in the Stamping and Body Assembly area, it seems likely that these hirings were allocated to this working area, which underwent major changes in the production process. Shifts in labour turnover patterns confirmed these trends. In 1984 labour turnover rates in Stamping and Body Assembly and Paint, Trim and Final Assembly had decreased to 20-25% of the 1980s level, an even bigger decrease than in the company as a whole where the decrease was 12-16%. (Table 9.5).

Table 9.6

Percentage of terminations by grade and area and hirings by grade over the total hourly headcount in the grade and area, Dagenham - 1980, 1982 and 1984 (1)

Grades	1980				1982				1984			
	Terminations			Hirings	Terminations			Hirings	Terminations			Hirings
	St/Ba	P,T/Fa (2)	Total		St/Ba	P,T/Fa (2)	Total		St/Ba	P,T/Fa (2)	Total	
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
1	10.9	5.7	9.6	4.8	23.1	3.5	7.0	-	-	2.7	4.4	-
2	17.2	23.7	18.8	10.5	7.5	8.1	6.8	-	3.7	3.7	3.4	-
3	8.9	6.0	8.9	0.8	5.4	5.0	4.2	-	1.8	2.8	2.4	-
4	6.5	1.5	6.8	1.4	2.4	6.2	3.7	-	0.3	5.2	2.0	-
5	9.9	10.6	9.6	4.3	5.7	5.9	3.8	2.2	5.4	3.8	3.6	-
App.	1.0	-	10.9	40.9	1.2	-	12.0	20.2	2.4	-	2.9	24.2
% (3)	12.6	15.4	12.6	6.5	6.1	6.7	5.5	1.2	3.2	3.3	3.0	0.9
N =	692	777	2,902	1,492	320	321	1,074	240	136	137	451	135

(1) Total for Dagenham incudes St/Ba, P,T/Fa, plus Engine, Foundry, CKD, Trim Manufacture (River), and Miscellaneous.
(2) Excludes Trim manufacture (River Plant).
(3) % of terminations in all grades over the total headcount in the area.

Source: Headcount Analysis - Ford-Britain

In Ford-Brasil, labour turnover rates decreased enormously in the 1980s compared to the trend in the 1970s. According to data from the Ministry of Labour statistics presented by Carvalho[6], the proportion of workers in the car companies dismissed fell from 1.6% in 1978 to 0,6% in 1982. He argues that improved job security is related to the management strategy of improved product quality. The same argument is raised by Gitahy [7] on the basis of studies of two car firms in São Bernardo.

In 1984 as Table 9.7 shows, in the São Bernardo site labour turnover was reduced to less than half the level of 1980. Wastage rates were also markedly reduced. In comparison with Dagenham labour turnover rates remain higher from 1982 to 1984. This is the result of major hirings at São Bernardo, particularly in 1982 and 1983, at the time when the production process was renewed for production of the Escort.

While hirings were consistently reduced at Dagenham, São Bernardo had a less clearly defined policy on labour turnover until 1984. Terminations in the early 1980s clearly correspond to the reduction in production levels, but hirings are also high during this period of crisis. The rate of labour turnover decreased once new agreements with the union required that terminations be negotiated.

The causes of high rates of labour turnover were very

---

[6] Carvalho, 1987, Table 15, p. 192. Data based on 'Indicadores SINE-MTb/ANFAVEA'. Note that the figures quoted refer to the proportion of workforce terminations <u>not</u> to the rate of labour turnover as Carvalho claims.

[7] Gitahy, 1986.

different at Dagenham and São Bernardo in the 1970s. Labour turnover rates reached 50% in various years during the 1970s in certain industrial branches and companies in Brazil. In 1979 2/3 of the total terminations of metalworkers in the State of São Paulo were initiated by the employers.[8] Similarly in Ford São Bernardo in 1978 69% of dismissals were initiated by the company.[9]

In earlier research about patterns of workforce mobility in the Brazilian labour market in the 1970s I have concluded that the mobility of workers in the labour market was determined by employers and was conditioned by the nature of the production process and the kind of labour that it required. However, although workforce utilization policies differed according to the complexity of the industrial unit, in broad national terms discipline was the fundamental issue in determining continuity of employment.

As in the case of Britain, production fluctuations affected employment and wage levels in Brazil in the 1970s. When market demand increased employment levels were higher and workers better paid because competition for labour raised wages. In these moments, such as during 1973 and 1974, employee initiative in labour turnover became more significant, and those who moved to new jobs usually achieved wage increases that the ones who remained in the same job could not achieve. Those most able to move to new jobs and get higher wages were skilled workers. Thus, wage differentials in favour of skilled workers increased during the decade.[10]

---

[8] Silva, 1981, p. 21.

[9] Humphrey, 1982, p. 98.

[10] See Silva, 1981, Ch. 2 and 3.

Table 9.7
Headcount (1), hirings, terminations, wastage rate and labour turnover
Ford-Brasil and São Bernardo site

Year	Ford-Brasil		São Bernardo site				
	Headcount salaried + hourly paid	Index of labour turnover (2)	Hourly headcount	Hirings	Terminations	Wastage rate (3)	Labour turnover (4)
1976	21,596	-	-	-	-	-	-
1977	20,000	-	-	-	-	-	-
1978	21,092	96	-	-	-	-	-
1979	22,597	96	-	-	-	-	-
1980	22,505	100	12,555	1,386	1,686	13.4	24.5
1981	20.554	72	11,771	621	2,119	18.0	23.3
1982	19,422	27	11,200	1,015	322	2.9	11.9
1983	21,620	-	12,858	2,077	298	2.3	18.5
1984	22,376	-	13,104	673	521(a)	5.5	9.1
1985	23,048	-	12,876	300(b)	185(b)	-	-

(1) Includes employment on cars, vans, buses and trucks, excludes tractors.
(2) Gitahy, 1986, Table 29, p. 40. This is a benchmark index calculated from average hirings and terminations during the year over average employment.
(3) Wastage rate = (terminations x 100 : hourly strength
(4) Labour turnover = (hirings + terminations x 100) : hourly strength
(a) Excludes 205 voluntary redundancies in January 1984.
(b) January to June. Terminations exlcude 241 voluntary redundancies in May 1985.
- : Not available

Source: For Ford-Brasil: headcount, ANFAVEA; index of labour turnover, Gitahy, 1986.
For the site of São Bernardo, for headcount, hirings and terminations: Lei 4923, Ministério do Trabalho.

Brazilian labour legislation imposed no constraints on employers' rights to dismiss. Compensation for dismissals amounts only to about one month's wage per year of employment. (Unemployment benefit did not exist until 1985, and since then has been low and difficult to qualify for.) Moreover, employers' frequent use of the clause of 'Justa Causa' for dismissals effectively eliminated any right to compensation. The weak labour movement in the 1970s had no means to prevent large numbers of workers being fired.

Dismissals were used to control labour. In my previously cited research,[11] I found that about 20% of dismissals on employer initiative were motivated by disciplinary reasons, such as absence, lateness, refusal to do overtime, refusal to accept a new task ordered by the foreman, or as a result of other sorts of problems with supervisors. Because employment levels were closely geared to the immediate requirements of production, absences and lateness were not tolerated and monitoring of production levels was tight. Slowing down production usually resulted in a dismissal on the basis of 'Justa Causa', workers were also disciplined for low productivity.

The use of dismissal as the major instrument of discipline strongly reinforced discipline amongst the workers who remained on the job. Loosing the job became the punishment for not keeping strictly to the company's rules.

This pattern of labour utilization in Brazil in the 1970s did not affect all industries and all groups of workers equally. Conflict can be managed in different ways and distinct personnel policies developed for different production requirements, depending on labour availability and training requirements. Conversely, wage structures are not only the result of the cost of labour in the market, but result from a process of adaptation between production requirements, labour market conditions and the laws that regulate them. For example, Ford's five-dollar day instituted in 1914 had the purpose of stabilizing labour turnover, socializing the workforce into more co-operative habits and pre-empting union organization.[12] Company labour turnover policies are expressions of these requirements and

---

[11] Silva, 1981.

[12] Meyer, 1981.

patterns of regulation.

On the same lines, Humphrey argues that employers in the car industry in Brazil developed a specific system of labour use and control in the 1970s based on relatively high wages, a complex wage structure and high labour turnover to increase productivity and control labour costs.[13] This was made possible both by tight control of labour at factory level and by state control over unions and rank-and-file militants.

3. Wage and job structures

In the mid 1980s wage and job structures in Dagenham and São Bernardo are more similar to those in other car firms in each country than to each other. In Britain, the divergences in payment systems between British Leyland/Austin Rover and Ford have narrowed enormously.[14] In the same way, job and wage structures have become very similar at the Ford plant of São Bernardo and the other motor companies in the ABC area.[15] In the ABC, firms not only compete for the same workforce but also negotiate wage settlements and working conditions with a single trade union, or, in a few cases, with more than one union each of

---

[13] Humphrey, 1982, p.105.

[14] This argument is made by Marsden et al, 1985, ch. 2.

[15] There are some differences in numbers of job titles and wage grades but the structures are shapped by the same general principles. For a comparison of wage levels and the general distribution of wages in different car companies see DIEESE, 'Guias de Contribuição Sindical', Metalúrgicos de São Bernardo do Campo. To compare Ford-Brasil's wage structure with that of Volkswagen do Brasil, see Peliano, 1985, p. 177 to 182.

which shares a common political perspective.

However, despite the differences, some common general characteristics are found at Dagenham and São Bernardo. Both have a similar workforce distribution among the three main car manufacturing areas (Body construction, Paint, and Trim and Final Assembly) (see Tables 5.1 and 5.2) and a very high proportion of semi-skilled labour, 74% in Dagenham and 64% in São Bernardo (Tables 9.2 and 9.3).

These similarities provide an interesting basis for comparison of differences in the job and wage structures in Ford's subsidiaries in Brazil and Britain. Differences between them seem to be designed primarily to fit particular conditions of the subsidiaries' local labour markets, rather than to fit the subsdiaries' structures into any particular strategy of the parent company in industrial relations.

In the USA Ford has had a system in which wages are set by a formula mechanism, with nationally determined rates of pay, negotiated with a single national trade union, the UAW (United Auto Workers). Standardization of pay and work rules, from the 1950s to the September 1982 3-year Agreement was based on job definitions and extended to all auto workers in all auto companies.[16] The UAW agreement is based on detailed job classifications that specify the requirements of each job. These job classifications are the basis of a seniority ladder and other job regulations. Although local collective bargaining agreements can define job characteristics and negotiate the movement of workers within plants, very little divergence emerged across

---

[16] For a detailed analysis of this system in the 1970s and recent changes see Katz, 1983.

companies until the early 1980s.[17]

Zabala's (1983) study of a General Motors plant describes the different job structures for production and skilled workers in the American system.[18] Skilled workers are specialized along segmented craft lines. This structure of job demarcations by trade group corresponds to that at Dagenham before November 1985. For example, pipefitters do not perform electrical work. But, unlike Dagenham, where skilled workers were allocated to particular departments,[19] skilled groups operated plant wide while production workers' duties were confined to particular departments. The November 1985 agreement at Ford-Britain extends the working areas of all groups of workers, particularly maintenance, beyond department level. In 1981 skilled workers in the GM plant studied by Zabala were distributed across 15 crafts and 5 wage grades. However, production workers had a very different job and wage structure. Between 1973 and 1976 103 job titles with 25 wage rates existed for production workers. In 1981 these had been reduced to 92 job titles and 11 wage rates. This structure has great similarities with the job and wage structure in Ford-Brasil.

Katz argues that new models of job classification have recently emerged in certain plants in the United States as a result of changes negotiated in job control and other work rules. These changes have been a trade-off between work rules and employment levels, accepted by the unions in the context of a sharp decline in employment levels. Katz

---

[17] Katz, 1985, p. 31.

[18] Zabala, 1983, pp.501-511.

[19] Blue Book, February 1986 p. 87

describes an experiment at a GM plant, in which one department implemented a new single job classification where there had been 10 separate classifications before. This was accompanied by a 'pay for knowledge' system linked to the variety of job tasks mastered by the worker.[20] Such changes in certain GM plants in the United States are indicators of a widespread trend. Particularly interesting are the experiments with inter-craft flexibility, broadening of job classifications, single job classification for production workers and gradual moves to team work. Many of these same issues have been touched on in the mid 1980s' agreements in Ford Britain and Ford-Brasil.

Small changes have occurred in both subsidiaries over the years, such as the elimination of some job titles and the creation of new ones. At Dagenham, the most important change in pay until 1985 was the introduction of the weekly attendance supplement in mid 1978. The introduction of this supplement was aimed at reducing the level of absenteeism which had reached an average of 8.3% in 1978 compared to 7.2% in 1975. A gradual reduction in absence has occurred since. In 1985 the level of absences was 5.6%.[21] Also, the character of absences changed. Whereas in 1975 25.6% of absenteeism occurred 'without permission', only 8.6% fell into this category in 1985. The proportion of absences 'with permission' and 'certified sick' have increased since the late 1970s suggesting that management is more in control of the workers' presence on the shopfloor since the

---

[20] Katz, 1985, p. 82.

[21] In Vauxhall, at Ellesmere Port and Luton Plants, absenteeism in 1985 was 22%, according to union figures quoted by Basset, 1987, p. 11.

attendance allowance was established.[22]

In the job structure of Ford-Britain there is no career plan to facilitate moves from one wage level to another. Incentives that add to the normal pay rate are, since November 1985, based on supplements (the weekly supplement linked to no absences) and allowances which are discussed below.

The remuneration criteria at Ford-Britain were established through collective negotiations. The conditions to receive the weekly supplement are clearly defined on an equal basis for every worker; the conditions set out for payment of the Productivity allowances follow the determinations of the collective agreement and their appplication on a job-by-job basis is determined by local management in consultation with employees and their representatives.

A Dagenham shopsteward manifested his opposition to this latest implementation policy on the grounds that it would allow management 'to go as far as they wanted in individual plants'.[23] By permitting localized flexibility agreements, the unions have allowed management to take the initiative of making things their own way without any coordination from the trade unions. Difficulties in implementing the 1985 agreement are forseeable in the shopfloor opposition to the NJNC authority in approving the agreement. Particularly Dagenham's PTA plant has been very critical of the agreement as warned in their Bulletin 'Under Pressure'

---

[22] Data on absenteeism from 'Company absence percentages', Manpower statistics, Ford Britain.

[23] I am grateful to Dr. Sheila Cohen, from the School of Management at the Imperial College, London, for allowing me to use this interview, part of the fieldwork material for her research in Trade Union Democracy.

that more job cuts will pay for the allowances.[24]

4. The 1985 changes in industrial relations

New agreements on conditions of employment were negotiated at both Dagenham and São Bernardo during 1985 which raised important questions of flexibility and job security. The British agreement instituted many important modifications in working conditions and relations between management and workers at shopfloor level. The Brazilian negotiations in 1985/6 raised new clauses for discussion that were not agreed but which represent an interesting aspect of the 'stabilization' of labour relations. The Brazilian negotiations will be discussed first, followed by a detailed account of the agreement affecting conditions of employment at Dagenham.

In Brazil, the unions in the ABC area had demanded for some time 'salário profissional' (professional wage), which would guarantee that workers undertaking equal jobs in different companies would earn the same. The unions view this policy as a means to reduce high labour turnover rates by making it less attractive to employers to dismiss workers. They also wanted to prevent job rotation inside the plants through a clear and wide structure of job contents and wages for 'professional' labour. However, they had encountered resistance from employers to this clause.[25]

---

[24] 'Under Pressure', 1987 No. 1.

[25] This account of proposals and changes in wage and job structures are based on three interviews: one with a member of Ford-Brasil's Industrial Relations staff, one with a representative of the Metalworkers Union and one with a Factory Committee member. Documents used include, 'Classificação de cargo', Ford-Brasil, 1985 and 'O que muda na

In December 1985, however, the Employers association (SINFAVEA) offered a unified wage and job structure for all the car companies in the ABC region, to be implemented from August 1986. It was a plan to homogenize, for example, the approximately 300 job titles and 9 wage grades at Volkswagen, with the structure of Ford with 135 job titles and 12 wage grades. This proposal was not accepted by the unions at that time because it was part of a 'package' involving a wage increase lower than that claimed by the workers. Nevertheless, this changed employer attitude towards a common wage structure represents a shift from the fire-fighting policies of the 1970s. The employers were no longer interested in bidding for new employees in the labour market. Instead they were concerned to make the external labour market unattractive.

Changes in job or wage structures are not subject to negotiation with the unions. The Consolidação das Leis do Trabalho (CLT) established many conditions of job and wage fairness, but employers retained a lot of freedom to rule on these matters. In Ford-Brasil, between 1982 and January 1986, wage grades were reduced from 14 to 12, job steps were reduced from 6 to 5. In the areas of Body Construction, Paint, and Trim and Final Assembly job titles were increased from 89 to 103. Reduction in grades and steps were moves towards homogenization but the meaning of the increase in job titles is not clear. An analysis of the contents of the new jobs compared with the previous jobs would be necessary to make possible an account of the implications of this change. But sufficient data is not available.

---

estrutura salarial' Commissão de Fábrica, October 1985.

São Bernardo's structure is quite different from Dagenham. Currently, Dagenham has a system of 5 wage grades,[26] each corresponding to a different wage level (Table 9.2). The grades cover a job structure including 58 job titles.

In chapter 6 we saw that Ford's payment system was unique in Britain for a long time. Since its installation the company has operated a Measured Day Work system while the prevailing pattern in the engineering industry up to the 1970s was piecework. Only since the late 1960s have other car and components companies abolished the piecework system, which is now very rare. Because traditionally Ford has never paid piece rates in the United States or abroad, the peculiar way it has operated in Britain in relation to the British pattern, was seen as an imposition of the parent company's policies and a reluctance to adopt the features of the British system, which the Americans saw as detrimental to productivity.[27] However, as we have seen, there is no coincidence between the wage and job structures in Ford in United States, Britain and Brazil. There are common features which the American system shares with the British and with the Brazilian systems, but differences are significant underlining the importance of multinational adaptations to national contexts of industrial relations and labour markets.

Before 1967 Ford-Britain had over 700 job titles classified into four grades of labour - skilled, semi-skilled, unskilled and women - which had corresponding fixed wage

---

[26] Before the 1985 Pay Claim negotiations the wage grades were refered to as A, B, C, D and E. Since November 1985 they have been changed respectively to 1, 2, 3, 4 and 5.

[27] A discussion of this argument is presented in Gennard and Stever, 1971.

rates. Variations in weekly earnings depended on the number of hours worked, overtime rates for nights and weekend, shift and abnormal working conditions allowances and merit money. In this way mobility was between jobs and increases in earnings depended on individual effort within the framework of the worker's job, as well as the discretion of the foremen and supervisors in selecting workers for merit payments.[28]

In 1967 a job evaluation analysis based on the content of each job concluded that 'technological development in motor manufacture has blurred the traditional distinction between 'skilled' and semi-skilled' work...'.[29] Hourly paid job titles were reduced to 552 and classified into 51 job families, which were placed within five new grades. Women were placed in the appropriate grades,[30] abnormal working conditions allowances were discontinued and merit money was replaced by a scale of service increments.[31]

At Ford-Britain, the most important revisions on the Conditions of Employment Agreement in 1985 were the replacement of the 1967 wage structure with regrading of occupations and the institution of the Lineworkers'

---

[28] For changes in the wage structure at Ford-Britain until the late 1960s, see Friedman and Meredeen, 1980, pp. 43 to 51, and 64 to 69.

[29] Friedman and Meredeen, 1980, p. 45. See also Ford's documents: 'Job evaluation project'; 'The Urwick, Orr and Partners' approach to job evaluation'; and 'Profile Review procedure'.

[30] The women's strike for 'equal pay' at Ford's River Plant in 1968 originated as a protest against their job grading and pay in the 1967 wage structure. This industrial dispute is the core of Friedman and Meredeen, 1980.

[31] Friedman and Meredeen, 1980, p. 46.

Allowance and the Productivity Allowance. The former corresponds to payment of 2% over grade level, the latter of 4%. Linework, as defined in the 'Agreement and Conditions of Employment for hourly paid employees', (the 'Blue Book'), is direct production work, where the operator receives his component or task from a continuous moving track or line, the speed of which determines the work cycle of that operator. These hourly paid employees on line work are in wage grades 2, 3 and 4 and are also called production operators in Ford's terminology. They are also entitled to receive Productivity allowance. Only one productivity allowance can be received. Employees qualify for Productivity Allowance provided three conditions are fulfilled. 1. Versatility and flexibility. 2. The acquisition and use of new skills. 3. The elimination of inefficient lines of demarcation.[32] In November 1984, 35.6% of the hourly workforce in Ford-Britain were assembly-line workers; 38.9% were transfer machine operators. Both groups, under a variety of job titles, qualified for both Lineworkers and Productivity Allowances. 17.5% were in craft jobs. The remaining 8% were classified under jobs that would qualify for Efficiency Allowance.

The Lineworkers' Allowance was traded off against the discontinuance of the job evaluation system and the grading grievances procedure and a significant reduction in the number of job titles. As we have seen job titles were reduced from 483 to 58. In fact, the institution of the Lineworkers' Allowance was a sine qua non for the institution of Productivity Allowances, which covered a much wider spectrum of changes in working practices and were the corner stone of the 1985 agreement.

---

[32] Blue Book, 1986 p. 84

Productivity: Implementation of the Allowances scheme

Productivity allowances are of three kinds:

1. **Production operators' allowance.**
2. **Craft Employees' allowance.**
3. **Efficiency allowance.**

Each of these relates to a particular set of manufacturing tasks and jobs.[88]

Production operators' allowance:

Production operators' allowance is payable to semi-skilled operators on three conditions. Firstly they must perform either (1) Seek, repair, and defect identification tasks or (2) Use techniques for controlling processes. In addition they must implement (3) flexibility and mobility within and between departments and operating units, (4) maintaining and cleaning the work station and its immediately surrounding area.

1. <u>Seek, repair and defect identification</u>. Operators must inspect incoming work, prior to performing the specified operations, in order to ensure that previous operations have been performed to the required quality standards. When defective work is identified, the worker must carry out the appropriate repairs (when feasible). Operators must certify the quality of their operations, and should they produce

---

[88] Information on the 1985 agreement and its implementation is based on the official agreement signed on 17 February 1986, a Ford Dagenham document concerning the implementation of productivity allowances in Body Construction (Feb/1986), one interview with management and two with shopstewards.

work that requires repair, must carry out the appropriate repairs. When defects are identified, the worker must mark them and record details of both defects, and any repairs carried out.

2. Techniques for controlling processes. Workers must become familiar with and use techniques for controlling processes, such as Statistical Process Control and record and apply the results.

3. Line feeding. Workers must procure and feed material to the workplace, using material handling equipment if necessary.

4. Adjustments to equipment, cleaning and lubrication. Workers must carry out minor running adjustments to equipment or facilities, make corrections to settings, effect replacements of worn or defective parts, carry out lubrication, maintain appropriate records, and keep the equipment and facilities clean. They must assist, within their capability, craft workers who are carrying out maintenance duties.

The production operators allowance is payable to a group of workers working on related production operations, provided that all of them meet the criteria. Thus, cooperation among workers becomes a condition of the allowance.

These conditions imply great changes in job content, because the same operator does jobs that would previously be split between many workers.

Craft employees' allowance:

Craft employees' allowance applies to electrical and

mechanical craftsmen. These workers are required to be flexible and versatile across the full range of their respective skills, and undertake relevant electrical or mechanical tasks outside their own trade. They must work on the preparation of the machinery prior to maintenance work, slinging, the operation of lifting equipment, and driving, where these are feasible. Craftsmen must also carry out line patrol for preventative maintenance, taking corrective actions as they identify the need, and be mobile across a plant or operation. Line patrol is normally done by a monitor team, comprised of one electrical and one mechanical craftsman. They work from strategic, but not necessarily fixed positions, from where different lines, or working stations, can be seen.

To qualify for the allowance, craft workers must also update their knowledge and improve skills by taking appropriate training courses provided by Ford. Once craft workers are in receipt of the Craft employees' allowance, they must provide brief diagnostic reports, records of action taken, use and respond to mechanized reporting facilities, and make recomendations to improve the performance of machinery on which they have worked.

Efficiency allowance:

Efficiency allowance is designed to cover other employees not identified as line workers, production operators or craftsmen. For instance, in the Body Construction area this covers maintenance assistant, maintenance operator, maintenance operator advanced and maintenance specialist. Conditions that qualify for the receipt of the efficiency allowance are general conditions of flexibility, versatility, and the acquisition of new skills, the acceptance of more efficient work methods, including the

elimination of demarcations, and self-financing productivity increases in the work areas. For example, in the specific case of the job titles referred to in the Body Construction area, workers must '...be prepared to pass on their current skills to other groups of employees', 'accept/cooperate with transfers to other areas', '... accept new work loads ...(such as) line monitor, complete monitor sheets/job cards, etc.'.[34]

The implementation of the productivity allowances scheme at Dagenham Body Construction started in March 1986. Although the Agreement stated that implementation was to be done jointly by management and the unions working together, management was far advanced in its implementation plans. According to a manager at Dagenham, 'the company had known for a long time what changes needed to be implemented. We had everything ready and the unions did not have time to think.'[35]

The aim was that Body Construction output would be increased to 1,104 bodies a day with the Productivity Allowance System from the current 995.[36]

These changes were to be implemented over a period of at least two years commencing February 1986. The aim was to reduce unit costs by producing additional volume with considerably reduced indirect manning and no increase in direct manning. The results of the implementation of this agreement are not, however, part of this research since it

---

[34] From Ford Document, Feb/1986, p. 9.

[35] Interview in September 1986.

[36] See Chapter 5.

was not possible to undertake further fieldwork after November 1986.

The recent changes in Britain suggest that flexible forms of work organization seem to fit better with less segmented job structure. Conversely, a more fragmented job structure seems to permit the flexible use of labour in Brazil. The reason for this difference in both cases relates to the union presence and its impact on workplace control. The analysis of the process of implementation of the Employee Involvement programme, which follows, makes possible to extend this discussion of the importance of different institutional frameworks of workers representation.

5. The Employee Involvement Programme (EI)

The Employee Involvement programme (EI) was developed in 1979-80, especially for Ford, by the American consultancy firm Teleometrics International, in the United States. Ford had hired experts in organizational behaviour who conducted research on management-labour relationship in some of its plants in the United States and abroad, and concluded that from top to bottom, from parent company to subsidiaries, a basic autocratic management style dominated.

The present state of implementation of Employee Involvement at Dagenham and São Bernardo differs a great deal. A description of the content and forms of introduction of the schemes highlights the aims of the programme, the constraints imposed by the form of management-labour relationships in each subsidiariy, and the corporate strategies used to adapt the implementation of the principles of the EI to diverse circumstances.

The Employee Involvement Programme at Dagenham

In Britain no Employee Involvement programme has been implemented in the sense that it was conceived by Dearborn's consultants. There have been some moves to develop it, but union opposition has been very strong. However, some attempts to create forms of co-operation with labour along the lines of EI have been made by management, particularly in 1984 through attempts to institute the Quality Programme, and through the prominence given to the 'lead operator' job, since the November 1985 agreement. In this section, close attention will be paid to the 'lead operator' role, after a discussion of the views of Ford of Europe, which developed the particular Employee Involvement programme for Britain. Both of these cases provide an interesting contrast with how the Employee Involvement programme came to Brazil.

The 'Japanization' of Ford-Britain

In Britain greater awareness at top management level of matters related to employee involvement followed a report by three senior managers of Ford of Europe on their visit to seven Japanese companies in 1983. The report recommended the introduction of Japanese working practices in British plants as a step to close the gap of cost disadvantage compared with Japanese competitors.[37] The visit was part of the programme of catching up with the Japanese which had been initiated in 1979, when the first such visit occurred. A second visit had taken place in 1980. These experiences had resulted in the launch of the 'After Japan' programme.

---

[37] The Ford of Europe management report is transcribed in CAITS, April, 1984.

In their 1983 report the senior managers stress that Ford had now matched the degree of automation in use in Japan but had failed to match Japanese application of the technology.

The Ford of Europe management team observed that the Japanese worker works at a faster pace than the average European worker. They observed in their visit to Toyota's Body shop that 'The few people we saw in the lines work hard and quickly, they are mostly jogging with parts to the stations. What we saw represented an incredible utilization and balance of manpower.'[38] However, they found it unlikely that the same pace could be achieved in Europe, because such 'commitment' comes, as they say, '...from living in an atmosphere of total trust, capability and awareness'. Also, they stressed that 'the average Japanese car worker has received three times more education and vocational training than the average Ford of Britain employee'.[39] This assessment led them to recommend more aggressive training programmes.

They paid special attention to Toyota's hiring and training policies. According to the management report, all new Toyota hires spend one month of orientation in the company's training facility, three months on the shopfloor and three months at a dealer operation. Following placement, all employees rotate for three to five years through various assignments until they find their area of specialty, where their strengths are best employed. Toyota believes that increased knowledge eliminates job related

---

[38] Caits, April, 1984, Attachment B, p. 8.

[39] Caits, April 1984, p. 6.

fears, avoids militancy and unrest.[40]

They were particularly fascinated by and strongly emphasized the role of Toyota's production system: 'kanban' or 'just in time' system. The kanban is a process and material handling philosophy, as well as an inventory system. It originates from the idea that, if production control can be managed perfectly, inventory is not necessary. Just in time production is the manufacture of the necessary products in the necessary quantities at the necessary time. Standardization of production underlies this 'philosophy' of production.

Kanban's benefits are especially attractive in the light of the visiting management estimates that roughly 60% of Ford's total costs is 'non-value-added', i.e., inbound and in-process transportation costs, together with the machine loading and unloading costs. Kanban would reduce warehousing, eliminate double handling, practically abolish in-process inventory and get rid of cardboard boxes for handling in the plant.[41]

The kanban system views inadequate production control as the main cause of excess inventory and of in-process parts shortages, that prevent the smooth flow of production. Its solution is to abolish the function of production control and integrate it into the process of production. Parts are classified according to the time they must be kept in the

---

[40] Caits, April 1984, Attachment B, p. 3.

[41] Material collected from the Metalworkers Union of São Bernardo on the principles and functions of the kanban, as developed by the subsidiary of General Motors, indicates complete similarity of their programme with the descriptions of Ford of Europe's management. See: General Motors do Brasil, Document 1; Ingersoll Engineers, n.d.; and Paiva et al, 1985.

plant, and sub-assemblies are built adjacent to point of installation.

There is no indication that any particular policy or co-operation programme resulted immediately from this 1983 visit to Japanese competitors. The importance of this document is its stress on the kanban system and on workers' training and educational levels for the achievement of the integration of operations at shopfloor level required to improve flexibility and increase efficiency. The kanban system also reduces enormously the use of indirect labour. This became an important policy in Ford-Britain and was one of the main purposes of their redundancy programmes, and the restructuring of the job structure in 1985.

'Lead operators' to head a 'team'?

In 1974 the 'Conditions of Employment Agreement' defined a new category of workers: lead operators. Their role is defined as follows in the 'Blue Book'.[42] 'Lead Operators may be appointed, whose duties will be of a non-supervisory nature and include, for example, covering for absentees and providing operators with on the job guidance and assistance. Employees in this category shall receive an additional hourly payment of 8% of the Standard Grade 3 rate, which will count as part of the Personal Hourly Rate in all respects.'

Until 1985 there was no clash between shopstewards and lead operators, as their activities were clearly defined. Since the implementation of the November 1985 agreement, however, lead operators have taken a more active role in shopfloor matters, antagonizing stewards. At Dagenham Body

---

[42] 'Agreements and Conditions of Employment', 1986, p.49.

Construction and P.T.A. (Paint, Trim and Final Assembly), in particular, lead operators' roles have caused concern.[43]

According to shopstewards, lead operators have been placed to head small groups of workers on the line, and have taken a supervisory role. In addition, lead operators and their groups have been taken to lunches and special meetings in the training room.

The job description of lead operators, however, is much more restricted than it appears in the brief 'Blue Book' definition. The description of the job states that lead operators will have no supervisory duties, no disciplinary responsibilities, not 'make out' time reports, not be a 'pace setter' (being excluded from Work Standards reviews), and not enjoy particular privileges above those of other employees.

The main concern of the shopstewards is that the meetings held by the company with lead operators and their team of workers, will discuss grievances or other things that should be dealt with by the shopstewards, thus weakening the shopsteward organization. Accordingly, the stewards decided to attend these meetings in order to undermine them. The same sort of strategy was applied by the trade union side of the Joint Work Committe (JWC) in 1984, when they put forward their proposals for participation in the company's Quality Programme.

During 1984 many meetings management took an initiative to introduce quality discussion groups and hold line side

---

[43] Interviews with two shopstewards. See also 'Under Pressure', 1987, nº 1.

briefings on quality matters. Shop stewards and unions opposed these meetings. In response, management explained their needs and the trade unions in the Joint Works Committee (JWC) worked out a scheme for improving participation in the resolution of quality problems. The unions' suggestion was that quality problems should be handled in a way consistent with the steps of the Grievance procedure. The trade unions' approach was agreed for a period of 6 months. The agreed process followed 6 steps:[44]

Step A - If a quality problem exists, the foreman will inform the local shop steward. (Problems could be with employees, materials, components, etc).

Step B - The foreman then goes ahead in the normal way to solve the problem.

Step C - If the problem remains unsolved the foreman and steward will attempt to find a solution involving individuals or groups of employees as appropriate.

Step D - If the problem is still not solved, then the area superintendent will get involved, possibly with the assistance of a JWC member where appropriate.

Step E - If the problem remains unresolved then the problem will be reported to the production manager and the two deputy convenors who will attempt to resolve it.

Step F - If the problem remains unresolved it will be progressed to the next meeting of the JWC.

---

[44] Transcribed from 'Trade Union participation in quality matters', letter from management to PTA supervisors, May 24 1984.

It is vivid in shop stewards' memories that after the unions put forward their proposals the company not only stopped the lineside meetings but also never used the new procedure put forward by the unions. The conclusion drawn by the stewards was that the company intended to use its meetings to discuss quality matters mainly to undermine the unions.

Thus, in 1984, the shop stewards succeeded in stopping the lineside meetings. They may succeed again in their strategy of resisting any usurpation of their rople by lead operators. As it stands, the lead operator approximates the functions of the 'facilitator', as defined in the original Employee Involvement programme, though it has been blocked at Dagenham this chapter will later describe how it has been implemented at Sao Bernardo.

The Employee Involvement Programme at São Bernardo

In Brazil the Employee Involvement programme was applied by a national consultancy firm, 'Dorsey, Rocha e Associados, Consultores e Editores, Ltda', the Brazilian associates of Teleometrics International. The first contact with EI, as recalled by Brazilian managers, occurred around 1979-80, when the president of the Administrative Council of the FMC, in Dearborn, visited the Brazilian subsidiary, bringing the message of a new integrative climate within the company, and calling for the creation of a typically indigenous name for the programme.[45]

---

[45] These accounts of the development of the Employee Involvement programme in Ford-Brasil rely on material prepared by the Consultants, and on interviews with 2 psychologists, 6 managers (3 in industrial relations, 3 in manufacturing), one coordinator of the Employee Involvement programme, one

The literal translation of the words Employee Involvement into Portuguese, carries a bad connotation of manipulation of employees' behaviour. Instead, it was decided that in Brazil the programme would be named 'Trabalho Participativo' (in English 'Participative Work'). Apart from the different label, the programme is exactly the same. Differences in regional application, to take account of 'cultural patterns' are an intrinsic component of Employee Involvement. The EI programme has two main modules, one related to management, other to white-collar and blue-collar employees.

Management Participation Employee Involvement

From 1980 to 1984 all managerial employees in Ford-Brasil, over 1,000 people, were trained in Employee Involvement principles. The programme is called Management Participation Employee Involvement. The development of the training programme was done alongside the identification of managerial problems, the training itself turning into research material. Groups were formed with managers from different areas, with the purpose of drawing on a variety of experiences. The consultants 'Dorsey, Rocha e Associados' trained top and middle management. All the other layers in the company's hierarchy were trained by the Training Department staff, which is within the area of Industrial Relations.

The core of the management training was a one week seminar carried out in a hotel in the countryside. The model seminar is organized around three main concepts which are

---

facilitator, one foreman, two Factory Committee members, and one union director. All of the consultancy material is in Portuguese.

considered crucial for the development of the managerial principles sought by Teleometrics in their approach to Employee Involvement. On the basis of these concepts individuals are expected to develop certain patterns of behaviour. The concepts employed are 'competence', 'power' and 'fields of force', each defined within a specific theory.

Ford has attached great importance to EI and its theory and concepts, but there is little material available on the thinking behind the programme. The detailed description of the theories which follows provides an account of the content of managerial thinking underlying EI. The documentation on which it is based was all obtained from Ford-Brasil and all the quotations are my own translations from the Portuguese.

Theory of competence

This theory is concerned with how to use power to influence decisions and leads into the introduction of the models of management. It lays down that the best managerial model arises from two correct approaches:

1. An emphasis on team work, autonomy and challenge, for which the model of a highly efficient manager is the one who is preoccupied with inter-personal incentives and with egocentric considerations of subordinates in relation to the job.

2. An understanding that the right managerial style is systematically learnt rather than supported by common sense

and intuition.[46]

The prescription of the management models is embedded in the view that the 'philosophy' that directs the operation of the organization is more important in the definition of management styles than the product or technology.

Managerial competence is defined by management interest on two dimensions of the organization: production and people. These two dimensions are used to define five style-types of management. The managerial competence index is defined by both managers' preferences for certain style and the impact of the opportunity and willingness of management to apply their efforts on the job. The higher competence is the one that shows the largest number of people applying their greatest efforts on the job for the longest time. The competence index is derived from a managerial 'grid' developed by the organizational psychologists Blake and Mouton (Diagram 14).[47] The five styles of management illustrated in the 'grid' are typified by the following behaviour:

Style 1/1 - The best and most efficient production is unattainable because people are lazy and indiferent. Mature and meaningful relationships are difficult because conflict is unavoidable.

Style 9/1 - People are instruments (tools) as well as machines. The responsibility of the manager basically consists of planning, directing and controlling the job

---

[46] These accounts are based on Hall, 1979, 1980, 1983a and 1983b; and on interviews in Ford-Brasil.

[47] Blake, R.R. and Mouton, J.S. - Group Dynamics: key to Decision Making, Gulf Publishing, Houston, 1961, as cited by Hall, 1981 and 1983.

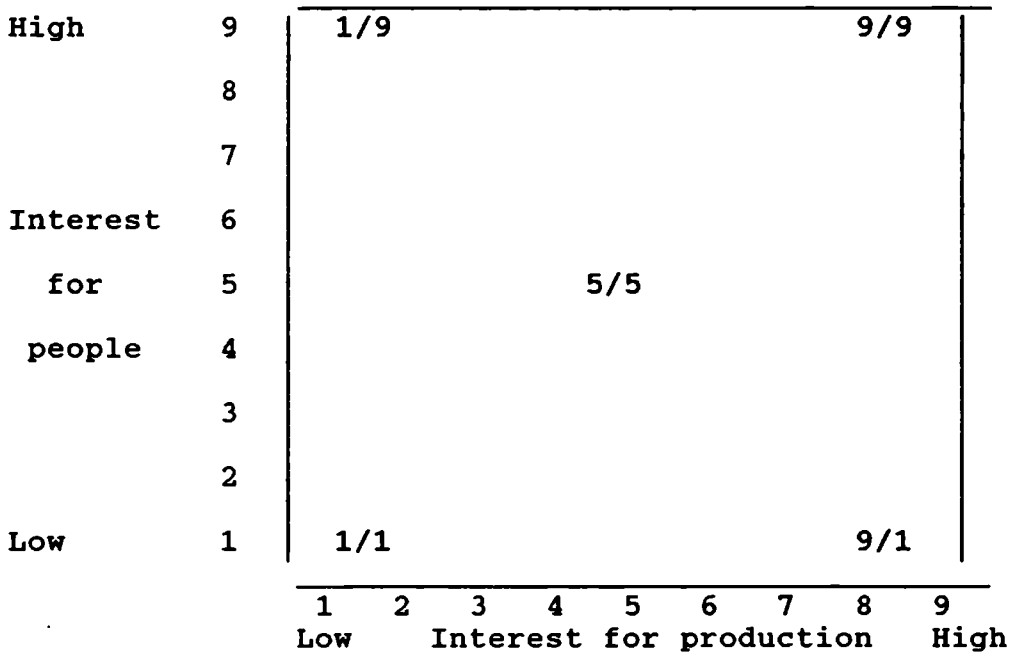
(work).

Style 5/5 - Production comes first but 'morale' cannot be ignored. Management beliefs: demand the necessary to achieve best production, but grant enough to maintain a satisfying 'morale'.

Style 1/9 - Production is linked to the absence of conflict and 'comradeship'. This is a sort of 'Country Club' approach.

Style 9/9 - Production is the result of integration between human and job requirements.

Diagram 14
The managerial 'grid'



Source: Teleometrics International, Hall, 1983a, from Blake and Mouton, 1961.

According to a psychologist employed by Ford-Brasil, the management style encountered in that subsidiary in the early 1980s, was identified as being Type 1.1 in the managerial grid of Black and Mouton. This style manifests a pessimistic and rigid approach where managers appear to be defensive, and subordinates need to emphasize their basic needs for personal security and association. Although involvement strategies are used, subordinates tend to think these are superfluous. This internal critique of the management style at Ford-Brasil closely complemented the development of new apporaches such as the company's official recognition of the Factory Committee in 1981.[48]

Theory of power

This theory is concerned with how influence is exercized, how a manager makes use of his/her power and authority to influence the thoughts, attitudes and behaviour of others. Hence, it involves control over the environment.[49] Within this framework management is seen as the use of formal authority and formal influence. Among the material prepared by Teleometrics for the seminar on the theory of power, a 30 page document called 'Working sheet', presents the 'Paradox of Abilene'[50] to illustrate the personal and organizational/ group inter-relation in the question of power. It is particularly interesting to summarize it here both because the use of psychoanalytical and psychological frameworks and concepts indicate an extremelly elaborated and sophisticated use of behavioural science in the development of the principles of Employee Involvement, and

---

[48] See Chapter 8.

[49] See, Hawker and Hall, 1981.

[50] Teleometrics, Harvey, n.d..

because this 'paradox' defines the Employee Involvement approach.

The 'Paradox of Abilene' is based on the principle that frequently organizations act in contradiction with the goals they really want to pursue, thus frustrating the true aims they want to achieve. The essential symptom of this 'paradox' is the incapacity to efficiently manage an agreement. Because efficiency in achieving agreement is essential to organizations, the paradoxical characteristic of the situation, requires a 'theory', or 'model', or 'plan' to resolve the paradox. Such a plan is drawn from the examination of the 5 fundamental psychological themes of profitable organizations: 1. Anxiety to act, 2. Negative fantasies, 3. Real risk, 4. Anxiety of separation, and 5. the Psychological reversion of risk and certainty.

1. Anxiety to act. This feeling appears when the motive of the action contradicts the real understanding of the problem. People act according to what they believe they were supposed to do, not according to their inner convictions. This is exemplified in the working sheet by Hamlet's monologue 'To be or not to be, that is the question.'

To maintain the feeling of integrity and self-esteem is more productive than quietly compromising with absurd situations. Another parallel is made between the anguish, postponement, and conter-productive behaviour of managers who compromise with the absurd and the feelings expressed by Hamlet.

2. Negative fantasies. These are the expression of 'Hamlet's syndrome'. This concerns the nourishment of negative fantasies concerning what would have happened if

the members of the organization had acted according to what they thought they should have done. The existence of such fantasies provides an acceptable excuse to the individual and to others, as to why he/she acts as he/she did, liberating him/her of the responsibility of having to act to face the problems of the organization.

3. Real risk. This is an existential condition and brings the fact that a wrong attitude can have worse consequences than the present misfortune. The best example is to end up going somewhere else for fear of taking the risk of going to where one needs to go.

4. Fear of separation. This is presented as the core of the 'Paradox of Abilene'. The idea is that individuals do not fear the unknown but they are afraid of what is known. This is reflected in the fear of running risks which can generate separation from other people. To interrupt projects already started is an example of this fear.

5. The psychological reversion of risk and certainty. Because taking risks can lead to separation and loneliness which individuals fear, these existential risks are inverted into imaginary risks. In this way, the possibility of what could happen becomes a certainty. This misleading interpretation of the real risk is seen as a consequence of the present cultural emphasis on technology, competition, individualism, transitoriness and mobility that increase the fear of loneliness and take away experience of the satisfaction of a committed relationship. This explains why organizations create self-destructive decisions.

The prescriptions to escape the 'paradox' redefine the roles of victim, torturer, and collusion. It is argued that the search for failures and recrimination fit into roles

that are anti-functional to the organization because they drain energy away. Through collusive behaviour the subjects remain in the conflictual situation as a way of escaping reality. The theory states that the responsibility to solve the dilema created by the 'paradox' belongs to no one in particular. The resolution is that the solution comes from confrontation and dialogue. This is the principle of Employee Involvement: that the members of an organization know better about the facts of the organization than anyone else: - or the organization itself.

Reality, knowledge and confrontation are the keys to facing the 'paradox'. Changes in organizational functioning can be enormously facilitated if the company confronts the facts that they know and agree with. Reality comes from the identification of real and false conflicts. False conflicts happen when individuals agree on how to act but do exactly the opposite. Then anger, frustration and censorship arise in the form of conflict not embedded in real desagreements but originating in defensive reactions. The conformist behaviour of individuals is usually a consequence of group pressures and inhibits creativity, involvement, productivity.

The major constraint on the eradication of this 'paradox' is, according to Teleometrics' 'Paradox of Abilene', that the great majority of individuals have a tendency to prefer solutions based on functionality and technology rather than on atitudes of 'being'.

To underline the ideas of the 'paradox of Abilene', the material on the theory of power in Employee Involvement traces a parallel with the 'Myth of Sisyphus'. The myth says that Sisyphus was condemned by Pluto to push, for all his life, an enourmous stone to the top of a mountain, only

to watch it roll back to its original position once he released it. As presented by Camus,[51] this myth establishes an existential point of view on the presence of the absurd. Camus suggested that Sisyphus' task was absurd and meaningless. However, Camus also commented that through observing that whenever he released the stone it returned to its place at the bottom of the mountain, Sisyphus was able to realize the absurdity of his destiny and overcame himself. The Employee Involvement material states that confrontation with the 'apparent' absurdity of carrying on endless meaningless tasks in offices or shopfloors ('spending time pushing stones up hill in our organization') may alleviate the weight of the task. This is the teaching from Sisyphus who, 'through passive, but conscient acceptance of his destiny, was able to carry on his activities'.[52]

Theory of fields of force

This theory consists of the identification of restrictive and impelling forces and the use of skills to control them, and change behaviour. The idea is that any job depends on other people and on the environment and requires concepts and corresponding techniques to deal with events and feelings such as the invasion of space or the use of 'armours'.[53] responses to smell, touch, etc.

---

[51] See Camus, Albert - The myth of Sisyphus and other essays, Vintage Books, Ramdom House, 1955.

[52] Teleometrics, Harvey, n.d. p. 26.

[53] The concept is borrowed from the Bio-energetic approach in Psychology created by Wilhelm Reich, who talks about the 'armour of character'.

These 'theories' of competence, power and fields of force occupy one seminar day each. They embody the stage of reflection which is followed by the stage of action. Thus, on the fourth day of the seminar, participants are involved in dramatization groups where they take on different roles. For example, someone takes on the role of an authoritatian manager, an other performs as a democratic supervisor, someone else is an employee who is going through a difficult situation in his/her private life which is affecting the job. The remainder of the group observe and discuss the situation expressing their feelings in relation to each role and situation involved. The last step in the first seminar programme is self-assessment, consisting of a batch of tests on managerial competence, which is applied to the participants.

The second phase of Management Participation Employee Involvement consists of a revision seminar in which the personal absortion of the principles sought by the programme is checked, through the use of a battery of tests. These are 'true' and 'false' statement tests in which participants are asked to assess various statements.

Besides the implementation of the Management Participation Employee Involvement programme, more research was conducted by initiative of the parent company, in Brazil. An American, specialist in organizational behaviour worked in Ford-Brasil for over two years, carrying out a survey on organizational competence, in which 'how would you like things to be' and 'how do you think things are', questions were asked of management. The survey was conducted in April 1983. Data tabulation was done in the United States. Ford-Brasil came out as having serious organizational problems, particularly low organizational efficiency.

Employee Involvement, or 'Trabalho Participativo'

From March to June 1984 the Employee Involvement programme coordinator (an Industrial Relations employee), and four facilitators were given two sorts of training. The first is called 'Teleometrics I" and consisted of a short version of the Participative Management Employee Involvement, destined to teach changing management styles and make participants acquainted with the EI philosophy and concepts. The second consisted of seminars on how to conduct meetings and on the aims and characteristics of EI groups and Problem Solving analysis.

In July and August 1984 lectures on Employee Involvement philosophy were presented to approximately 650 supervisors/leaders and to the Factory Committee members.

At the beginning the Factory Committee did not agree with the introduction of Employee Involvement, comparing it with Quality Circles, which the union firmly opposes. In face of their resistance, Ford established a plan to gain the Factory Committee's approval.

Initially, one union director, one member of the Factory Committee and an hourly worker, together with the site manager, industrial relations manager and the coordinator of the Employee Involvement programme, were taken to the United States to visit the Kansas City Plant and the Woodhaven Stamping Plant to become aquainted with the implementation of Employee Involvement.

Next, the short version of the Management Participative Employee Involvement seminar, together with the seminar on the characteristics of EI groups was given to half of the

Factory Committee members (12 people).

After this, a meeting was held with the president and secretary of the Metalworkers Union of São Bernardo, and company representatives from the industrial relations area including staff from Personnel Development and Planning, in order to present the EI philosophy and implementation plans and show the Company's position in relation to participative management and worker relations.

The Factory Committee, however, continued to resist the introduction of Employee Involvement. In January 1986, a Latin American Conference of Ford's Factory Committees held in São Bernardo with the support of the Metalworkers union strongly opposed the EI programme.[54] Faced with the opposition of the union and Factory Committee, Ford implemented EI more slowly than initially planed.

At the beginning, from August 1984, groups were formed from selected employees. These were selected by their area management as people who would be able to take the lead in developing EI in their working areas. The first four groups represented the four main manufacturing areas in the site: powertrain, body-construction, paint, and trim and final assembly. Each group had a facilitator, a coordinator, and 10 to 12 members. The facilitator is an employee trained by the company to take on this role. The training consists of group dynamics technique, and instruction on analysis and problems solving. Officially his/her job is a normal production job, like the other workers, but he (or she) takes time off (in practice the EI moderator job is full time) to work on EI activities. The

---

[54] See Metalworkers Union of São Bernardo Bulletin, nº 926.

facilitator's role is to take the problems discussed in the group to the right channels where solutions can be implemented. The coordinator is chosen by the group.

A film was made to make EI known across the company. The film covered the actions of the few existing EI groups, and showed positive statements by workers about the programme. It was first shown to managers, superintendents, supervisors, and foremen at São Bernardo and the Research Center in São Paulo. São Bernardo workers were shown the film between September and December 1985.

Once the film was shown, the formation of groups with voluntary participants started. Between January and July 1986 12 EI groups were established.

In September 1985 the Latin America Automotive Operations (LAAO) section of FMC organized a meeting in Argentina with an agenda to discuss training and the accomplishments of the Employee Involvement Programme in Latin American subsidiaries. Six achievements were presented in the Report of Ford-Brasil on its experience at São Bernardo.[55]

1. Improvement of work conditions in the Body Assembly area.

Corcel and Del Rey front suspensions were manually assembled by operators. This operation required the operator to physical lift 23,5 kg and carry it 8 meters to the line. A group of die makers met with line workers to find a solution. Many suggestions were offered. It was agreed that they would work on installing a monorail with a pneumatic hoist and an anchoring device. The result was the improvement of working conditions and improved safety.

---

[55] LAAO Report, Ford-Brasil, August, 1985.

2. Safety improvement in the Stamping area. Small part stamping in small press operations caused safety risks and required physical effort for the removal of parts, and also resulted in low productivity. This problem affected operators and supervision. A group of employees from Process Engineering, Tool and Die Room and Maintenance examined several suggestions and concluded that the construction of a fixture was necessary. This fixture (hinged chute and pneumatic conveyor) was adapted to the press. The modification resulted in a productivity increase of 30% and the elimination of one operator. The elimination of the operator's job consequently eliminated his exposure to accidents. The effect of this measure must be multiplied by 11 because fixtures were then built and installed on 11 presses.

3. Quality improvement in Cut and Sew (Uphosltery) area. The safety belt cutting operation was performed by the conventional system of manual shearing. In this operation it was necessary to cut material, fold, insert and sew it to the fastener. As a consequence, a certain amount of material was wasted due to unthreading. A work group comprising maintenance and process engineering people, created a device capable of cutting the nylon belt in its correct size. The improved belt cutting and simultaneous vulcanization is performed with the use of an electrical-resistance device. The safety belt waste level was reduced from 4% to 0.2%, and quality and appearance were improved.

4. Productivity improvement in Body sub-assembly area. The car body serial number engraving device operated slowly, caused production slow-down and required excessive maintenance time. A work group from the Tool and Die Room examined the problem and decided to construct a

hydraulic/electrical fixture. The modification has resulted in an increase in operation speed, greater efficiency, and reduced by 75% the time spent in maintenance, increasing productivity by about 70%.

5. Productivity improvement in the Powertrain area. Milling machines using regular cutters to face cylinder blocks required frequent tool grinding to maintain the specified surface finish. A group of employees with Tool Analysis studied and developed a solution for the problem using a shaving insert in the milling cutter. This resulted in: 1. increased tool life from 300 to 3,000 parts/hour; 2. reduced frequency of bit replacement and extended life of inserts; 3. reduction of equipment weight from 37 kg to 13 kg; 4. reduction in the cutter replacement time from 5 hours to 20 minutes.

6. Productivity improvements in the Final Assembly area. On the Assembly line the engine serial number was punched manually. It was necessary to remove the fuel pump and the spark plug cables (needed for the hot test) prior to the operation. A group from Process Engineering area went to investigate this problem. They designed and built a device that could be operated without needing to remove the parts, thus eliminating disassembly and reassembly operations. This resulted in a 50% productivity increase.

Statistical Process Control (SPC)

SPC is part of the EI programme. It has been developed in Ford-Brasil since 1983. The training for SPC in Brazil is organized by the Training Department based on a programme developed in the United States. Ford-Brasil has subcontracted the Engineering School (FEI) to give SPC training. By January 1986 about 4,000 hourly workers at São

Bernardo had attended this training. The first ones selected had jobs with a close relationship to quality control and product technology. Training was done in a hotel in São Bernardo, where workers were taken for the day. The programme lasted from 8 am to 6 pm and consisted of speeches on technical approaches to product quality procedures, and elementary statistical exercises for beginners on probability theory, combinatory analysis, Shikawa diagrams, and Pareto theorem. Efforts are directed towards teaching that numbers are a simple thing to deal with.

In comparison with Dagenham Employee Involvement has been fairly effectively implemented in São Bernardo. The opposition of the Factory Committee at the latter has not blocked the development of the programme. The ease of implementing EI in Brazil relates to the weakness of job controls, or 'restrictive practices'. The case of the Statistical Process Control is of special significance. Whereas its introduction in Britain was part of a hard negotiated deal in November 1985, in Brazil it occurred as a normal practice of change in job tasks.

6. Why different reforms towards flexibility

This section summarizes the strategies developed to achieve flexibility, quality and efficiency, in order to define more clearly why the priorities of management have been so different in the two sites.

Industrial relations policies on employment and conditions of work at Dagenham and São Bernardo have required very different kinds of reforms to achieve flexibilization. This

stems from different historical patterns of work organization and labour relations that condition the present tendencies in employment and work organization.

Workforce reduction policies had different effects on different sections of the workforce. At Dagenham overall employment levels fell. At São Bernardo employment has not decreased continuously but has shown an upward trend since 1982. In both sites the proportion of workers in higher wage rates, generally the most skilled workers, has increased.

There is a tendency towards 'stabilization' of the workforce. Labour turnover rates have decreased in both countries. Historical series of data for Dagenham indicate more terminations of less skilled workers over time, reinforcing the tendency towards a rise of overall skill levels. However, decreases in labour turnover rates have different historical significances in the two subsidiaries because of their contrasting patterns in the 1970s. At Dagenham terminations were mostly on the employee's initiative, because of better opportunities elsewhere in the labour market. At São Bernardo, however, labour turnover was mainly initiated by employers and had a strong element of control of labour unrest. Also, high labour turnover increased wage differentials amongst the workforce, while pushing down overall wage levels.

Both patterns show that legal frameworks, union polices, labour processes and labour markets induce different employment practices. The stabilization of labour turnover in Brazil reflected concerns of both unions and employers. Workers, for example, demanded 'salário profissional'. In parallel Ford's president offered a deal for employment

stability in return for a no-strike deal in 1984,[56] and all the car companies in the area of São Bernardo offered an unified wage and job structure in 1985. The aims and motives were different but the various proposals reflected significant common concerns.

The job structure of Ford-Britain was, until 1985, based on an evaluation system that used the same principles as the one in use in Brazil. But, the wage structure was simpler: the Brazilian subsidiary had more than double the number of wage grades. Since the application of the November 1985 agreement, Ford-Britain has moved towards an enormous reduction of job titles and flexible deployment of labour. These are first steps towards the implementation of the sort of 'team work' and single job and wage classification schemes observed by Willman and Winch, and by Katz, in their studies of other car firms.[57]

The British 1985 agreement deals with many issues towards implementing flexibility that would be irrelevant in the Brazilian context because of differing legal frameworks or practices. The most interesting comparisons are:

1. Craft demarcation lines do not exist in Brazil where the working class is more homogeneous than in Britain. The single trade union reflects this.

2. Workers undertaking new training is not an issue of resistance in Brazil. The context of a lack of job security and low wages makes workers eager for new job opportunities and improvements.

---

[56] See Chapter 8.

[57] Willman and Winch, 1985; Katz, 1985.

3. Versatility and flexibility of Brazilian workers is very wide. Since refusal to undertake tasks assigned by the foreman can result in dismissal for Just Cause (i.e. without compensation), versatility and flexibility become intrinsic characteristics of jobs. The resistance of Brazilian employers to the 'professional wage' expresses their opposition to the introduction of 'rigidities' in the allocation of workers and changes that could lead to tying up workers to defined groups or 'professions'. Mobility inside the plants is great because it is customary to rotate jobs, moving workers to different machines, aiming at getting operators accustomed to all the shopfloor operations. However, less skilled operators are generally not moved to machines operated by higher skilled workers.

4. Within job definitions in Brazil, seek, repair, and defect identification or line feeding are taken for granted as a part of the job assignment, if the worker is told or expected to do it.

5. The use of techniques for controlling process, such as Statistical Process Control (SPC), or completing monitor sheets or job cards, is done in Brazil as part of operators', maintenance, foremen's, or other manufacturing workers' jobs. Brazilian skilled workers ordinarily provide reports and records of actions to supervisors.

6. Concerning adjustments to equipment, cleaning and lubrication, the minor tasks, as described in the British November 1985 agreement, are done by the operators themselves in Brazil. Technical cleaning, however, is done by an outside contractor at São Bernardo, whereas it is a in-house activity for Ford-Britain.

7. Ford-Britain prioritizes the reduction of indirect

manning. But indirect manning is already low at São Bernardo. (Tables 5.1 and 5.2).

In the wage and job structure at Dagenham and São Bernardo there are few similarities. They refer mainly to the amount of semi-skilled labour and the distribution of workers distribution between manufacturing areas. The differences relate to broad factors of local labour markets and institutional frameworks of management and worker relationships.

FMC-US'S wage grading and job structure has a certain resemblance to the Brazilian subsidiary as far as production workers are concerned and is relatively more different from the British set-up. However the US operations have more in common with the British subsidiary on craft demarcations. Recent changes in the American UAW agreement are similar to changes Ford is trying to introduce in Britain, such as the aim to break craft demarcations, and move towards single job classifications and team work. In the 1985 agreement in Britain, the Lineworkers allowance is directed towards a single job classification, and the 'line patrol' organization for maintenance introduces the 'team work' concept. The case of the 'lead operator' may represent another step towards 'team work'.

Wage level differences between Ford-Britain and Ford-Brasil are striking, the lowest in the former is higher than the highest in the later. Given greater possibilities of intensification and flexibility in the actual use of labour in Brazil, we can conclude that management would find it easier to increase output and labour productivity levels in Brazil.

The state of development of Employee Involvement in Dagenham and São Bernardo suggests that the flexibility offered by such a programme can only possibly be implemented after wage and job structure reforms become effective at Dagenham. However, other moves, following the same principles as employee involvement, can, and have been, implemented without the complete acceptance of the programme. The 1985 agreement provided many clauses of co-operation from labour.

At São Bernardo, the merger of Ford and Volkswagen in Autolatina has introduced a new factor, the integration of the industrial relations systems of both companies. They have a lot in common in their geographical proximity, the wide and effective national framework of labour legislation, the same trade union with whom to negotiate, the same labour market, and wage and job structures that are similar in terms of the system of grades, steps and job fragmentation. The greatest difference between Ford in Brazil and Volkswagen do Brasil has in fact been their labour relations systems. Volkswagen's System of Employees Representation is very close to management, whereas Ford's Factory Committee has been autonomous and closely linked to the union. But the Factory Committe was indefinitely suspended by Ford 4 months before the deal between the two companies was publicly announced. Volkswagen's very extensive system of Quality Circles, with about 450 groups in operation,[58] may aid the harmonization of the systems.

But in both Dagenham and in São Bernardo, despite all the differences in conditions and strategies, recent developments show that their managements are clearly

---

[58] Carvalho, 1987, p.201, data refers to 1984.

preoccupied with increasing the flexibility and involvement of the workforce as a means to improve efficiency and quality in order to face the fierce competition of the 1980s.

Chapter 10
CONCLUSION

In summarizing the conclusions of this thesis it is helpful to concentrate on three themes. 1. The methodology of studies of the kind developed here. 2. The interaction between recent trends in international competition in the car industry and different national patterns of development. 3. The relationship between technology and work and its implications for productivity and flexibility.

1. Methodology

(a). The methodologies of previous similar comparative studies - which I have broadly characterized as technological and cultural determinisms - were found to be unsatisfactory in understanding the establishment of different relationships between labour and technology and differences between national patterns. The methodology adopted in this study drew on several frameworks. In particular it drew on historical regulation approaches, describing the trends and phenomena historically, and stressing the integration of different levels of determination. Thus the study covers intermeshing occurrences at the level of the shopfloor, the unions, the factory, the global corporation and its subsidiaries, and national and international systems of industrial relations, strategies of competition, and economic and political relations.

(b). The second major issue of methodology involves the complex problems of measuring productivity. My critique of numerous existing studies of productivity and their

assumptions stressed the need to attend to very precise comparisons of production processes and work organization. The thesis stresses the importance of the detailed organization of production both for productivity and for possibilities for flexibility. The very detailed study of the use of technology at Dagenham and São Bernardo in Chapter 5 attempts to demonstrate the complexity of the issues involved. The conclusions are necessarily cautious. While certain comparisons of productivity and quality may be made, statements about the highest productivity or highest product quality have to be surrounded by various qualifications regarding the kind and quantity of output. Above all, work organization and the industrial relations systems at national and company levels are crucial conditions that shape the effectiveness with which technology is used.

2. Trends in international competition and industrial relations.

(a). Many of the most important trends stem from the dominant international position of the Japanese that has made their production systems the target which all other producers seek to match. Attention from competitors in the car industry has focused on this system, and companies have realized that the system involves not only technology but also social relations of production and 'national enterprise systems'. This involves acknowledging that various institutions contribute together to shape different competitive environments and there are no single isolated elements that can be copied. This also involves recognizing that institutions are related to historical patterns.

(b). The second main theme that is emphasized is that management competitive strategies shape their industrial relations strategies. Certain achievements in competition are dependent on particular forms of labour management. But similar goals can give rise to very different industrial relations strategies. Thus, a common pursuit of flexibility can give rise to a focus on reform of the job structure at Dagenham or on Employee Involvement at São Bernardo.

(c). But the scope that multinational companies have for these strategies is shaped by the context of national industrial relations systems. Hence developments in national economies and politics in the 1970s to the 1980s have had important direct implications for the car companies and Chapters 6, 7 and 8 suggest that these links have become even more important and direct in recent years.

(d). The articulation of Ford-Britain and Ford-Brasil within the international production strategy and structure of the Ford Motor Company indicates two very different patterns of integration. Historically, Britain has a very long industrial experience, a sophisticated market and experience of fierce competition. Brazil on the other hand, has had little experience of motor vehicle production, a domestic market based on lower incomes than the developed countries, and a protected market.

The developments of the 1980s have contradicted expectations that an industrial base more involved in the international economy would lead production and market trends and evolve most rapidly. In fact, within the Ford Motor Company, Britain has become disinternationalized as a producer even while its market has become the centre of

the most intense international competition. In contrast, in Brazil, national and international competitive pressures have oriented car prodution much more towards the export market. British production has been narrowed by the process of worldwide integration whereas in Brazil integration has forced production to become more internationalized.

3. Technology and work

(a). Recent literature on trends in the labour process has discussed the crisis of Fordism and the emergence of Flexibility. The emergence and diffusion of electronics and new forms of flexible automation have changed the traditional basis of technical and social production arrangments. In particular, many of the traditional conceptions about location of plants, economies of scale, patterns of manufacturing integration, and the combination of tasks of conception and execution, and the composition of employment, do not stand up to scrutiny in the new conditions of production.

(b). Some of the most important changes in this area which have been discussed in this thesis are: (i) Although economies of scale are still a major issue they no longer play such an overriding role in defining product competitiveness, cost/price relations and profits. Economies of scale in new areas such as research and development have become much more important. (ii) Parent companies' production decisions are still of crucial importance but subsidiaries horizontal links and supplier relations are becoming of greater importance for efficient production. (iii) Perhaps the most dramatic changes have come in the composition and quantity of employment. There

has been an enormous decline in employment levels in the car industry in Britain and much of the world. But, in Brazil, after a brief fall, employment has recovered. In both countries, however, contrary to many forecasts, the relative proportion of skilled employees has increased.

(c). The divergence of patterns of technology and work in Britain and Brazil raises some difficult and stimulating issues. In recent literature, one common way of looking at new technology and labour in relation to patterns of development has been to stress that new technology, and hence the flexibility in production that it makes possible, is easier to implement in developed countries because of closeness to rapidly changing markets and the producers of the new equipment, and the availability of trained labour. Conversely, it has been argued that the management of labour can be easier in underdeveloped and developing countries because of weaker worker organization and greater possibilities of intensification of labour use. However, with new technology, this 'docile cheap labour' advantage would disappear both because of the more complex operations and educational levels required and because of problems in the diffusion of new equipment to these areas (such as Brazil's microelectronics legislation).

Yet, Newly Industrialized Countries continue to grow in significance in the international motor industry. New producers have appeared in the Far East and Mexico and Brazil have increased their participation in worldwide production. Why has this been so? My argument is that it has been easier to introduce labour flexibility in contries like Brazil. At the same time, the importance of technology per se in introducing flexibilization and creating productivity and product quality has been

overstated. It is not possible to achieve good product quality or high productivity with the state-of-the-art technology alone. In fact, it has proved surprisingly possible to enhance productivity and make very high quality products via work organization. It is undeniable that some technological improvements in key areas are essential for competitiveness. But one lesson of this thesis is that neither the power of new technology, nor the constraints it imposes, must be over-emphasized.

SOURCES

DOCUMENTS:

Ford Motor Co. Ltd (Ford-Britain).

Annual Report and Accounts, various years.

Ford Facts, Public Relations Office, n.d.

Agreements and Conditions of Employment. Hourly Paid Employees ('Blue Books'), various years.

Documents on the 1967 Job structure: 'The Urwick, Orr and Partners' Approach to Job Evaluation', ' Ford Motor Company Job Evaluation Project. The Organisation and Plan', Profile Review Procedure'.

Selected Job descriptions. Ford Industrial Relations Dept.

'Joint Review of Dagenham operations achievements and objectives', April 1984. (12 pages).

'The Development and Utilization of Human Resources in the Context of Technological Change and Industrial Restructuring. Human Resource Development and New Technology in the Automobile Industry: a case study framework', Company Report prepared for OECD (Organization for Economic Cooperation and Development) Center for Educational Research Innovation, May 1984 (39 pages).

Document 1: 'Improving the external environment', Oct 1984 (20 pages).

Document 3: 'The future of the foundry and Dagenham. Part One.' Bill Hayden, Vice-President Manufacturing Ford of Europe, address to Trade Unions, February 1984.

'Building a more Competitive Europe'. Paper prepared for the EEC, 1985 (16 pages).

Letters exchanged between the Company's chairman and industrial relations management and the Trade Union side of the NJNC's chairman and research officers for the Trade unions. 1984 and 1985.

'Ford National Joint Negotiating Committee. Union side. 1985/6 Wages and Conditions Claim'. Paper for presentation. (38 pages).

Ford NJNC - 'Submission by the Trade Unions on the 1985/6 Wages and Conditions Claim', 5th October 1985 (38 pages).

Ford NJNC - 'Company Reply to the Trade Unions' 1985/86 Wages and Conditions Application', 25th October 1985 (24 pages).

'Observations from the Trade Union side of the FNJNC on Managements Reply to the 1985 Wage Claim', November 1985 (9 pages).

'Company's Reply', Nov 1985 (8 pages).

'Company's Final Offer', Nov 1985 (20 pages).

'More cash for more Efficiency', Ford Employee Information, NJNC, 11 November 1985.

'An Agreement', 17 February 1986. (18 pages).

'Body Construction Application and Implementation of Productivity Allowances', 28 February 1986. (29 pages).

Ford do Brasil S.A.

Organization Directory, December 1984. (25 pages) (Updated with interviews).

Notícias Ford, various numbers.

Relatório Anual, 1984 and 1985.

Records of industrial disputes from 1957 to 1984.

Trabalho Participativo, March 1982 (17 pages).

Report for the LAAO Conference. August 1985.

Regulamento Interno de Trabalho, 1985.

'Classificação de Cargo. Nova Estrutura', 1985.

Selected Job Descriptions. Industrial Relations Dept.

'Relação dos Funcionários Horistas por código de funçao'. November 1985.

Ford Informação. 'Trabalho Participativo', nº 1, Jan 1986.

'Manufacturing Engineering' Sheet on Escort welding, n.d.

Factory Committee and Union, São Bernardo

Regulamento da Comissão de Fábrica da Ford Brasil S.A. Conjunto Industrial de São Bernardo do Campo. (São Paulo, 1985).

Jornal da Comissão, (Bulletin of the São Bernardo Factory Committee) nº 8 October 1984, and nº 10 October 1985.

Tribuna metalúrgica, Bulletin of the Trade Union of Metalworkers of São Bernardo, various numbers.

'O que muda na estrutura salarial', Oct 1985.

'I Encontro Latino Americano das Comissões de Trabalhadores da Ford', Boletim Unificado, Jan 1986.

Document on the April 1986 Agreement prepared by the Factory Committee, n.d.

Shop Stewards and Unions, Dagenham

Under Pressure, PTA Shop Stewards Bulletin, various numbers.

Fraud News, Ford Combine Committee Bulletin, various numbers.

'Trade Union Participation in Quality Matters', May 1984.

Statistics on employment on the PTA shopfloor provided by PTA shop stewards.

INTERVIEWS:

São Bernardo

Interviews were carried out with 1 director, 10 managers, 3 supervisors, 12 staff in Industrial Relations and Manufacturing areas, 4 'delegados sindicais', 3 union directors, and 13 workers, during: September 1983, September 1984, January to March 1986, and January 1987.

Dagenham

Interviews were carried out with 6 managers, 2 supervisors, 3 shop stewards, 3 trade union officials and 5 workers: September to November 1985, April to November 1986, and July to December 1987.

Ford of Europe

One director and one manager were interviewed in November and December 1987.

NEWSPAPERS AND MAGAZINES:

Automotive Journals

Automotive News (Detroit).

What Car? (London).

Which Car? (London).

Car (London).

Quatro Rodas (São Paulo).

Brazil

Isto é (São Paulo).

Veja (São Paulo).

Visão (São Paulo).

Folha de São Paulo (FSP) (São Paulo).

Gazeta Mercantil (São Paulo).

Diário do Grande ABC (DGABC) (São Bernardo).

O Estado de São Paulo (ESP) (São Paulo).

England

Financial Times (London).

The Economist (London).

The Guardian (London).

The Independent (London).

The Industrial Robot (London).

International Labour Reports (ILR). (Manchester).

The Times (London).

Other Statistical Sources

ANFAVEA - Associação Nacional de Fabricantes de Veículos Automotores (National Motor Vehicles Manufacturers Association) São Paulo, Brazil.

Department of Employment Gazette, HMSO, London, England.

DIEESE - Departamento Intersindical de Estatística e Estudos Sócio-Econômicos (Inter-Trade Union Statistical and Socio- Economic Studies Department) São Paulo, Brazil.

LEI 4923 - Statistical series on employment, hiring and dismissals, produced by the Ministry of Labour, Brasília.

PNAD - Pesquisa Nacional de Amostragem Domiciliar (Sample domestic census survey), IBGE, Brazil.

SMMT - Society of Motor Manufacturers and Traders. London, England.

TURU - Trade Union Research Unit, Ruskin College, Oxford, England.

BIBLIOGRAPHY

ABERNATHY, William J. - The Productivity Dilemma: Roadblock to Innovation in the Automobile Industry. Johns Hopkins UP. Baltimore. 1978.

AGLIETTA, Michel - A theory of capitalist regulation: the US experience. New Left Books, London, 1979.

ALMEIDA, Maria Hermínia - 'O Sindicato no Brasil: Novos Problemas: Velhas Estruturas' Debate e Crítica 6 July 1975.

ALMEIDA, Angela Mendes, and LOWY, Michael - 'Union Structure and Labor Organization in the Recent History of Brazil' Latin American Perspectives 8 Winter 1976.

ALMEIDA, Maria Hermínia, and Araújo, A. M. C., - 'A Instutionalização de Novos Direitos na Esfera do Trabalho', Paper presented to the 7th Annual Meeting of ANPOCS. Aguas de São Pedro, 1983.

ALMEIDA, Maria Hermínia - 'Sindicalismo Brasileiro e Pacto Social' Novos Estudos CEBRAP 13, October 1985.

ALTSHULER, Alan; ANDERSON, Martin; JONES, Daniel; ROOS, Daniel; WOMACK, James - The Future of the Automobile, The Report of MIT's International Automobile Program, Allen & Unwin, London, 1985.

ARAUJO JR, José Tavares - Comércio exterior e mudança estrutural na economia brasileira, 1970-83 Instituto de Economia Industrial/Universidade Federal do Rio de Janeiro (Discussão 56), Rio de Janeiro, 1984.

BAIN, George ed. - Industrial Relations in Britain, Basil Blackwell, London, 1983.

BARANSON, Jack - 'Will there be an auto industry in the LDCs' future?' Columbia Journal of World Business May-June 1968.

BARDOU, Jean Pierre; CHANARON, Jean Jacques; FRIDENSON, Patrick; and LAUX, James M. - The automobile revolution: the impact of an industry, The University of North Carolina Press, USA, 1982.

BASSETT, Philip - Strike Free. New Industrial Relations in Britain Macmillan, London 1987.

BEYNON, Huw - Working for Ford - Penguin Books, Middlesex, (1983) 1984.

BHASKAR, Krish - The future of the UK motor industry- Kogan Page, London, 1979.

BHASKAR, Krish - The future of the world motor industry- Kogan Page, London, 1980.

BIGAZZI, Duccio, 'Management and Labour in Italy, 1906-45' in TOLLIDAY and ZEITLIN eds - The Automobile Industry and Its Workers, 1986.

BONNAFOS, Géraldine de; CHANARON, Jean Jacques; MAUTORT, Laurent de - L'industrie automobile, Ed. La Découverte/Maspero, Paris, 1983.

BOYER, Robert - 'L'introduction du taylorisme en France à la lumière de recherches récentes', Travail et emploi, nº 18, Paris, 1983.

BOYER, Robert - 'Rapport salarial, croissance et crise: une dialectique cachée', in BOYER ed. La flexibilité du travail en Europe , 1986.

BOYER, Robert (ed.) - La flexibilité du travail en Europe, La Découverte, Paris, France, 1986.

BRYAN, Richard - 'Monopoly in Marxist method' Capital and class. 26. (Summer 1985).

BRYAN, Richard - 'Competition and monopoly: a reply' Capital and class. 30. (Winter 1986).

BURAWOY, Michael - The Politics of Production, Verso, London 1985.

BURKET, Paul, 'A note on competition under capitalism' Capital and class. 30. (Winter 1986).

CAITS (Centre for Alternative Information and Technological Systems) - 'The Sumitomo File: The links between Ford, Mazda and the Sumitomo Group'. CAITS 1985.

CAITS - 'The 'Japanisation' of Ford UK', April 1984.

CARDOSO, Fernando - 'As contradições do desenvolvimento associado' Estudos CEBRAP 8 April-June 1974.

CARDOSO, Fernando, and FALETTO, Enzo - Dependency and Development in Latin America Berkeley, Univ of California Press ,1979. (Portuguese ed. 1969).

CARVALHO, Ruy de Quadros - Tecnologia e trabalho industrial

- L & PM Editores S/A, São Paulo, 1987. (Some references are to the original M.A. Thesis, UNICAMP, 1986).

CONFEDERATION OF BRITISH INDUSTRIES (CBI) - 'Trade Unionism in a Changing World: The Challenge for Management'. 1980.

CENTRAL POLICY REVIEW STAFF (CPRS) - The Future of the British Car Industry, HMSO, London 1975.

CHANDLER, Alfred D. - Strategy and Structure. Chapters in the History of the Industrial Enterprise MIT Press, Cambridge, Mass. 1962.

CHILD, John - 'Organization: A Choice for Man' in CHILD, John ed. Man and Organization, London, 1973.

CHURCH, Roy and MILLER, Michael - 'The Big Three: Competition, Management and Marketing in the British Motor Industry, 1922-39' in SUPPLE, Barry ed. - Essays in British Business History, London. 1977.

CLEGG, Hugh A. - The System of Industrial Relations in Great Britain, Blackwell, Oxford 1972.

CONTINI, Giovanni - 'The Rise and Fall of Shopfloor Bargaining at Fiat, 1945-80' in TOLLIDAY and Zeitlin eds. The Automobile Industry and Its Workers, 1986.

CORIAT, Benjamin - Du système Taylor à l'atelier de série robotisé: quel taylorism demain?' in MONTMOLLIN, M. and PASTRE, O. (ed.), Le taylorism, Editions La Decouverte, Paris, 1984.

CROZIER, Michel - The bureaucratic phenomenon, Tavistock Publications, London, Great Britain, 1964.

CROZIER, Michael - 'The cultural determinants of organizational behaviour', in NEGANDHI Anant R. (ed.)- Modern Organizational theory, Kent State University Press, U.S.A., 1973.

DIEESE - Boletim DIEESE, monthly publication.

DIEESE - 'Dez Anos da Política Salarial' Estudos Sócio-Econômicos 3, 1975.

DIEESE - 'Distribuição Salarial em São Paulo Segundo Guias da Contribuição Sindical' Mimeo. São Paulo. 1977.

DIEESE - 'Indústria Automobilística Brasileira' Informe Econômico 1981.

DIEESE - Plano de estabilização econômica e os trabalhadores, March 1986a.

DIEESE - O reajuste salarial e a escala móvel nos decretos 2283 e 2284: uma análise comparativa, March 1986b.

DIEESE - O Plano Cruzado II e os trabalhadores, November 1986.

DIEESE - 'Ford descongela preços e 'maqueia' produtos. E o salário?', Sub-seção do Sindicato dos Metalúrgicos de São Bernardo do Campo e Diadema. Sep 1986.

DOHSE, Knuth, JURGENS, Ulrich, and MALSCH, Thomas - 'From "Fordism" to "Toyotism"? The Social Organisation of the Labour Process in the Japanese Automobile Industry' IIVG Discussion Paper. WZB. Berlin 1984.

DORE, Ronald - British Factory, Japanese Factory: the origins of national diversity in industrial relations, Allen and Unwin, London, Great Britain, 1973.

DUNN, James - 'Automobiles in International Trade: Regime change or Persistence?' International Organization 41. 2. Spring 1987.

DUNNETT, Peter - The Decline of the British Motor Industry Croom Helm. London. 1980.

DYER, Davis; SALTER, Malcolm; WEBBER, Allan - Changing Alliances, The Harvard Business School Project on the Auto Industry and the American Economy, Harvard Business School Press, Boston, U.S., 1987.

EIU (Economist Intelligence Unit) - 'A strategic profile of Mazda' EIU Motor Industry London. The Economist Publications Ltd. June 1985.

FERRANTE, Vera Lúcia Botta - 'História Operária e Legislação Trabalhista: O FGTS e a Perda da Estabilidade' Escrito Ensaio, (São Paulo), 2 (4) 1978.

FREYSSENET, Michel - Division du travail et mobilisation quotidienne de la main-d'ouvre, Centre de Sociologie Urbaine, CNRS, Paris, France, 1979.

FRIEDMAN, Andrew - Industry and Labour MacMillan. London. 1977.

FRIEDMAN, Henry and MEREDEEN, Sander - Dynamics of Industrial Conflict: Lessons from Ford Croom Helm. London. 1980.

FORM, William H. - Blue-Collar stratification : autoworkers in four countries, Princenton University Press, U.S.A., 1976.

FOX, Alan - History and heritage - the social origins of the British Industrial Relations System, George Allen and Unwin, London, 1985.

FURTADO, André - 'A América Latina frente à crise mundial' in Cenários sócio-econômicos pra a América Latina, Textos para discussão, CEBRAP, São Paulo, December, 1985.

GALLIE, Duncan - In search of the new working class: automation and social integration within the capitalist enterprise. Cambridge University Press, Cambridge, Great Britain, 1978.

GALLIE, Duncan - Social inequality and class radicalism in France and Britain. Cambridge University Press, Cambridge, Great Britain, 1983.

GENERAL MOTORS DO BRASIL - Document 1. 'Kan Ban Experience', n.d. (probably 1984).

GENNARD, John, and STEVER, M. D. - 'The Industrial Relations of Foreign Owned Subsidiaries in the U.K.', British Journal of Industrial Relations, Vol. 9. 1971.

GITAHY, Leda - 'Implicações da automação microelectrônica para o processo de trabalho e os padrões de utilização da mão-de-obra na Montadora B. Emprego, salários e rotatividade', Mimeo, Instituto de Geociências, UNICAMP, DPCT, 1986.

GORDON, David M., EDWARDS, Richard, and REICH, Michael - Segmented work, divided workers, Cambridge University Press, Cambrigde, 1982.

GREATER LONDON COUNCIL (GLC) - The Ford Report - A Public Inquiry into the Ford Motor Company, GLC, Industry and Employment Branch, London, 1986.

GROOTINGS, Peter - Technology and work: East-West comparison, Croom Helm, London, Great Britain, 1986.

GUERRA FERREIRA, Cândido - 'Procès de travail et rapport salarial dans l'industrie sidérurgique - Etude de la formation des normes mondiales et du cas brésilien' - Thèse de doctorat - Université Paris X-Nanterre, Sciences Economiques, 1987.

GUIMARÃES, E. A. - Acumulação e crescimento da firma: um estudo sobre organização industrial, Zahar, Rio de Janeiro, 1981.

HALL, Jay - 'O processo da Competência'. Notes taken by Susan Donnell on a Conference given by Jay Hall in 26/Oct/1979 in Johannesbourg, South Africa. Teleometrics International/Dorsey, Rocha e Associados, São Paulo office, mimeo, 1979.

HALL, Jay - 'Competência como Mudança', Teleometrics International/Dorsey, Rocha e Associados, São Paulo office, mimeo, 1980.

HALL, Jay - 'Algumas considerações a respeito da Revisão da Competência Gerencial', Teleometrics International/Dorsey, Rocha e Associados, São Paulo office, mimeo, 1983a.

HALL, Jay - 'Competência Gerencial: Trabalhando productivamente com a maior parte das pessoas durante a maior parte do tempo', Teleometrics International/Dorsey, Rocha e Associados, São Paulo office, mimeo, 1983 b.

HARBRIDGE HOUSE - Ford of Europe - a Strategic profile, Harbridge House Europe, London, 1984.

HARVEY, Jerry B. - 'O paradoxo de Abilene: o Gerenciamento da Concordância', Teleometrics International/Dorsey, Rocha e Associados, Folha de Trabalho, São Paulo office, mimeo, n.d.

HAWKER, James R. and HALL,Jay - 'Desenvolvimento e Validação inicial de uma escala para avaliar a Motivação do Poder', Teleometrics International/Dorsey, Rocha e Associados, São Paulo office, mimeo, July 1981.

HIRATA, Helena - Enterprise and society: the case of Japanese and French International Firms, Institute of Developing Studies, Tokyo, Japan, November 1983.

HUGHES, John and GREGORY, Denis - 'Falling Exchange Rates, Productivity and Comparative Costs: The Opportunities for Ford' Evidence to GLC Public Inquiry, London, 1986.

HUMPHREY, John - Capitalist control and workers' struggle in the Brazilian Auto Industry, Princenton University Press, New Jersey, 1982.

HUMPHREY, John - 'Labour in the Brazilian Motor Vehicle Industry' in KRONISH and MERICLE eds. - The Political Economy of the Latin American Motor Vehicle Industry 1984a.

HUMPHREY, John - 'Car Production in Britain and Brazil: A comparison', Unpublished paper, Department of Sociology, University of Liverpool, April 1984b.

HYMAN, Richard - 'Trade Unions and the Law. Papering over the cracks' Capital and Class No. 31 Spring 1987.

INGERSOL Engineers - 'Just-In-Time..."their" way. It Works!. Just-In-Case... "our" way. It works too! But...'. Document prepared for General Motors do Brasil, n.d.

JENKINS, Rhys - Transnational corporations and industrial transformation in Latin America, Macmillan, London, 1984.

JONES, Daniel T. and PRAIS, Sig J. - 'Plant size and productivity in the Motor Industry: Some International Comparisons' Oxford Bulletin of Economics and Statistics Vol 40 May 1978.

JONES, Daniel T. and WOMACK, James P. - 'Developing countries and the Future of the Automobile Industry' World Development. Vol. 13, No.3, pp. 393-407, 1985.

JONES, Daniel and WOMACK, James - 'The Evolution of the World Automobile Industry' in MCGEE, J., and THOMAS, H., Strategic Management Research John Wiley and Sons Ltd. New York. 1986.

KATZ, Harry - Shifting Gears MIT Press. Cambridge, Mass. 1985.

KATZ, Harry and SABEL, Charles - 'Industrial Relations and Industrial Adjustment in the Car Industry' Industrial Relations Vol. 24 No. 3. Fall 1985.

KOSHIRO, Kazutoshi - 'Personnel planning, technological changes and outsourcing in the Japanese automobile industry' Technology Management, Vol. 2, Nos 2 and 3/4, 1987.

KRAFCICK, John F. - 'Comparative Analysis of Performance Indicators at World Auto Assembly Plants', MSc Thesis, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, Mass., USA, 1987.

KRONISH, Rich and MERICLE, Keneth - The political economy of the Latin American Motor Industry, The MIT Press, Cambridge, Mass, USA, 1984.

LEWCHUK, Wayne - American Technology and the British Motor Vehicle Industry, Cambridge UP, England, 1987.

LICHTENSTEIN, Nelson - 'Reutherism on the Shopfloor: Union Strategy and Shopfloor Conflict in the USA, 1946-70' in TOLLIDAY and ZEITLIN eds. The Automobile Industry and Its Workers 1986

LIPIETZ, Alain - 'Towards global fordism?' - New Left Review 132, London, Great Britain, March/April 1982.

LUCKE, Matthias - 'Scale Efficiency in the Brazilian Motor Vehicle Industry: an international comparison' Kiel Working Paper No. 298. Kiel Institute of World Economics. August 1987.

MAITLAND, Ian - The causes of industrial disorder. A Comparison of a British and a German Factory, Routledge Direct Editions, Routledge and Kegan Paul, London, Great Britain, 1983.

MARONI, Amneris - A estratégia da recusa, análise das greves de maio/78, Ed. Brasiliense, São Paulo, 1982.

MARSDEN, David, MORRIS, Timothy, WILLMAN, Paul, WOOD, Stephen - The Car Industry: Labour Relations and Industrial Adjustment Tavistock. London. 1985.

MARSTRAND, Pauline (Ed.) - New Technology and the future of work and skills, Frances Pinter (Publishers), London, Great Britain, 1984.

MATA, Milton da, and BACHA, Edmar L. - 'Emprego e Salários na Indústria de Transformação, 1949-69' Pesquisa e Planejamento Econômico 3 (2) June 1973.

MAURICE, Marc - 'Aspect methodologiques des comparaisons internationales à propos de l'approche de l'effet societal', Paper presented in the 'Seminaire Mutations Technologiques, nouvelles formes de regulation et transformations des entreprises', CNRS, Aix-en-Provence, France, October 1986.

MAXCY, George, and SILBERSTON, Aubrey - The motor industry, Allen and Unwin, London, 1959.

MAXCY, George - The multinational motor industry, Croom Helm, London, 1981.

MAXCY, George - Les multinationales de l'automobile, PUF/IRM, Paris, 1982.

MERICLE, Kenneth S. - 'The Political Economy of the Brazilian Motor Vehicle Industry' in KRONISH and MERICLE eds. The Political Economy of the Latin American Motor

Vehicle Industry, 1984.

MEYER, Stephen - The Five-Dollar Day: Labor Management and Social Control in the Ford Motor Company, Albany, NY, 1981.

MONJARDET, Dominique - 'Propos critiques sur les comparisons internationales d'entreprises', Paper presented in the 'Coloque EGOS' ,Noordwijk, CNRS, June, 1979.

NEGANDHI, Anant R. - (ed.) - Modern Organizational Theory, Kent State University Press, U.S.A., 1973.

NEVINS, Allan, Ford. The Times, The Man, The Company Charles Scribner and Sons. New York. 1954.

NICHOLS, Theo - The British workers question. A new look at workers and productivity in manufacturing, Routledge and Kegan Paul, London, 1986.

NÖEL, Alain - 'Acumulation, regulation, and social change: an essay on French political economy', in International Organization 41,2, Spring 1987, Pp. 303-33.

OKAYAMA, Reiko - 'Industrial Relations in the Japanese Automobile Industry, 1945-70: The Case of Toyota' in TOLLIDAY and ZEITLIN eds. The Automobile Industry and Its Workers 1986.

OLIVEIRA, Francisco de - 'Crítica à Razão Dualista', Estudos CEBRAP, No. 2., (São Paulo) 1973.

OLIVEIRA, Francisco de - A Economia da Dependência Imperfeita, Graal, Rio de Janeiro, 1977.

OLIVEIRA, Francisco de - 'Comments on the Cruzado Plan' Folha de São Paulo 29th November 1986.

OLIVEIRA, Francisco de, and POPOUTCHI, Maria A. T. - Transnacionales en América Latina; El compejo automotor en Brasil, Editorial Nueva Imagen, México, 1979.

PAIVA, Luiz A.; FOSSALUZA, Angelo N.; LISBOA, Olegário S.; TAKAMI, Roberto K. - 'Sistema Just-In-Time', São Paulo, mimeo, 1985.

PALMER, Gil - British Industrial Relations, George Allen and Unwin (Publishers) Ltd., London, 1983.

PARSONS< Talcott - The Structure of Social Action, Free Press, New York, 1968.

PASTRE, O. - 'Taylorisme, productivité et crise du

travail', Travail et emploi, nº 8., Paris, 1983.

PASSINGHAM, Bernie and CONNORS, Danny - Ford: Shop Stewards on Industrial Democracy Institute for Workers' Control. Nottingham, England, 1981.

PELIANO, José Carlos; CASSIOLATO, Maria Martha; SOUSA, Nair H. Bicalho de; NEDER, Ricardo; and CARVALHO, Ruy de Quadros - 'Impactos Econômicos e Sociais da Tecnologia microeletrônica na Indústria Brasileira. Estudo de Caso na Montadora 'A' de Automóveis', IPEA/IPLAN/CNRH, Brasília, Jul 1985.

PRICE, Richard - Labour in British Society Croom Helm. London. 1986.

QUEM E QUEM NA ECONOMIA BRASILIERA Editora Visão, São Paulo, 1981.

RAINHO, Luís F. and BARGAS, Osvaldo M. - As lutas operárias e sindicais dos metalúrgicos em São Bernardo; 1977-1979, Associação Beneficiente e Cultural dos Metalúrgicos de São Bernardo do Campo e Diadema, São Bernardo, 1983.

RAJAN, Amin and PEARSON, Richard (ed) - UK Occupation and Employment Trends to 1990, An employer-based study of the trends and their underlying courses, by the Institute of Manpower Studies for the Occupaptions Study Group, Butterworths, London, 1986.

RAMAMURTI, Ravi - 'Brazil's Computer Strategy' Journal of Management Case Studies, No. 3, 1987.

RODRIGUES, Leôncio Martins - Conflito industrial e sindicalismo no Brasil São Paulo. Difusão Européia do Livro. 1966.

RODRIGUES, Leôncio Martins - Industrialização e Atitudes Operárias São Paulo. Brasiliense. 1970.

SCHMITZ, Hubert and CARVALHO, Ruy de Quadros - 'Automation and Labour in the Brazilian Car Industry' Discussion Paper No. 239. Institute of Development Studies. University of Sussex. December 1987.

SECRETARIA ESPECIAL DE INFORMATICA (SEI - Special Secretary of Informatics) - Impactos Sócio-Econômicos da Automação, Brasília, 1984.

SHIMOKAWA, Koichi - 'Product and Labour Strategies in Japan' in TOLLIDAY, S. and ZEITLIN, J. - The automobile industry, 1986.

SILVA, Elizabeth Bortolaia - 'Política Empresarial de Controle da Força de Trabalho: Rotatividade como Dominação' Master's Thesis, FFLCH/University of São Paulo, 1981.

SINGER, Paulo - 'Observações complementares' in Cenários sócio-econômicos para a América Latina, Textos para discussão, CEBRAP, December, 1985.

SLOAN, Alfred P. - My years with General Motors - Anchor Books, New York, 1972.

STEVENS, David - The Brazilian motor industry, change and opportunity, Automotive Special Report, nº 8, The Economist Intelligence Unit, London, United Kingdom, 1987.

STREECK, Wolfgang - 'Industrial Relations and Industrial Change in the Motor Industry: An International View'. Public Lecture. University of Warwick. 23 October 1985.

STREECK, Wolfgang ed. - Industrial Relations and Technical Change in the British, Italian and German Automobile Industry: Three Case Studies IIM/LMP 85 International Institute of Management Discussion Paper. Wissenschaftszcentrum, Berlin. August 1985.

TAUILE, José Ricardo - 'Employment effect of microelectronic equipment in the Brazilian automobile industry' Texto para discussão nº 64, Instituto de Economia Industrial, Rio de Janeiro, December 1984.

TAVARES, Maria - Da substitucão de importacões ao capitalismo financeiro Zahar. Rio de Janeiro. 1972.

TAYLOR, Robert - The Fifth Estate. Britain's unions in the modern world Routledge London 1978.

TOLLIDAY, Steven - 'Government, employers and shopfloor organisation in the British motor industry, 1939-69' in TOLLIDAY, Steven and ZEITLIN, Jonathan eds. - Shopfloor Bargaining and the State: Historical and Comparative Perspectives Cambridge UP. 1985.

TOLLIDAY, Steven - 'Management and Labour in Britain, 1896-1939' in TOLLIDAY and ZEITLIN eds. - The Automobile Industry and Its Workers 1986a.

TOLLIDAY, Steven and ZEITLIN, Jonathan, eds.- The Automobile Industry and Its Workers: Between Fordism and Flexibility Polity Press/Basil Blackwell. Cambridge. 1986 .

TOLLIDAY, Steven - 'High Tide and After: Coventry Engineering Workers and Shopfloor Bargaining, 1945-80' in LANCASTER, Bill and MASON, Tony eds - Life and Labour in a Twentieth Century City. The Case of Coventry Cryfield Press Coventry 1986b.

TOLLIDAY, Steven and ZEITLIN, Jonathan -'Shopfloor Bargaining, Contract Unionism and Job Control: An Anglo-American Comparison' in TOLLIDAY and ZEITLIN eds. The Automobile Industry and Its Workers 1986c.

TROYANO, Annez Andraus - Estado e Sindicalismo São Paulo. Símbolo. 1978.

TURNER, H. A. , CLACK, Garfield and ROBERTS, Geoffrey- Labour Relations in the Motor Industry George Allen and Unwin. London. 1967.

TURU (Trade Union Research Unit) - 'The decline of the UK motor industry. The strategic considerations for motor industry unions'. Report for the TGWU Automotive Conference, England, July 1984.

UNDY, R.; ELLIS, V.; MCCARTHY, W. E. J.; and HALMOS, A. M. - Change in Trade Unions, Hutchinson, London, Great Britain, 1981.

UNDY, Roger and MARTIN, Roderick - Ballots and Trade Union Democracy Basil Blackwell. Oxford. 1984.

VAN DE CASTEELE SCHWEITZER, Sylvie - 'Management and Labour In France, 1914-39' in TOLLIDAY and ZEITLIN eds. The Automobile Industry and Its Workers ,1986.

VIANNA, Luiz Werneck - Liberalismo e Sindicato no Brasil Rio. Paz e Terra. 1978.

VOLPATO, Giuseppe - 'The automobile industry in transition: product market changes and firm strategies in the 1970s and 1980s' in TOLLIDAY and ZEITLIN eds - The Automobile Industry and Its Workers, 1986.

WEFFORT, Francisco - 'Origens do Sindicalismo Populista no Brasil (a Conjuntura do Após-Guerra)' Estudos CEBRAP 4 April-June 1973.

WELLS, J. - 'The diffusion of durables in Brazil and its implications for recent controversies concerning Brazilian development', Cambridge Journal of Economics, nº 1 , Cambridge, Britain, 1977.

WHEELOCK, Jane - 'Competition in the Marxist tradition' Capital and class. 21. , Winter 1983.

WHEELOCK, Jane - 'Competition and monopoly: A contribution to debate' Capital and class. 30. , Winter 1986.

•WHIPP, Richard and CLARK, Peter - Innovation and the Auto Industry. Product, Process and Work Organization Frances Pinter. London. 1986.

WILLIAMS, Karel, WILLIAMS, John and THOMAS, Dennis - Why are the British Bad at Manufacturing? Routledge. London. 1983.

WILLIAMS, Karel, WILLIAMS, John, and HASLAM, Colin - The Breakdown of Austin Rover. A Case Study in the Failure of Business Strategy and Industrial Policy Berg. Leamington Spa, UK, 1987.

WILLMAN, Paul and WINCH, Graham - Innovation and Management Control. Labour Relations at BL Cars Cambridge UP. 1985.

WILLMAN, Paul - Technological Change, Collective Bargaining and Industrial Efficiency Clarendon Press. Oxford. 1986.

WOODWARD, Joan F. - Management and Technology, HMSO, London, 1958.

WOODWARD, Joan F. - Industrial organisation: theory and practice, Oxford University Press, London, Great Britain, 1965.

WROBEL, Paulo S. - 'Política Nacional de Informática: o desafio está lançado'. in Brasil - Perspectivas Internacionais, Instituto de Relações Internacionais, PUC, Rio de Janeiro, Nov/Dec 1984.

ZABALA, Craig A. - 'Collective Bargaining at UAW Local 645. General Motors Assembly Division, Van Nuys, California, 1976-82', Ph. D. Thesis, University of California, Los Angeles, 1983.

ZEITLIN, Jonathan - 'The emergence of shop steward organization and job control in the British car industry: a review essay' History Workshop No. 10. Autumn 1980.

ZILBOVICIUS, Mauro, FERRO, José Roberto, and GRUN, Roberto - 'Novas Estratégias Empresariais e Novas Respostas Operárias: A Operação "Vaca Brava"' Paper presented to the ANPOCS Conference, Aguas de São Pedro, São Paulo, October 1986.