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CAPITAL, LABOUR, AND ECONOMIC PERFORMANCE IN THE ENGINEERING
CONSTRUCTION INDUSTRY, 1960-1990.

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ABSTRACT

This study engages with the debates on industrial relations and economic performance at the micro-level. Primarily, this issue has been addressed through the production function approach which seeks to correlate a variable for unionisation with an economic performance measure. Criticisms are put forward which stress the technical limitations of existing studies, the limitations of statistical studies in examining social processes, and theoretical problems with the production function approach. The literature recognises the need for a detailed, processual case study. The thesis is such a case study, examining the Engineering Construction Industry, i.e. the building of large power stations and process plants, from 1960 to 1990. The principal research methods were archive work and interviewing.

The industry was chosen because it constituted a 'crucial' case for the argument that labour militancy underlay the UK's poor economic performance in the 1960s and 1970s. The industry was characterised by widespread militancy and large project overruns, the assumption (tested within the thesis) being that the former caused the latter.

The key finding is that the chronic project delays were at root due to the opportunistic practices of contractors who deliberately and covertly delayed construction in order to force the client into offering extra payments. A key profit focus of contractors lay in exploiting opportunities to generate additional payments. The widespread militancy of the 1960s and 1970s exacerbated overruns, but the key significance of militancy was that it was used as a tool by contractors in reproducing beneficial commercial relations with clients. The improvement in performance in the 1980s was at root due to the rise of managing contractors who curbed opportunism. Unconstrained by high levels of labour militancy, managing contractors adopted a low trust route to improve project performance, implying that the basis for longer term development has not been laid.

A 'crucial' case study of the British worker argument has rejected the thesis that militancy underlay poor performance. The relationship between opportunism, militancy and poor performance uncovered within the study potentially has relevance for other important sectors of the UK economy.

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Glossary

AEU-CS	Amalgamated Engineering Union - Construction Section
AEU-ES	Amalgamated Engineering Union - Engineering Section
ASBSBSW	Amalgamated Society of Boilermakers, Shipwrights, Blacksmiths, and Structural Workers
CEGB	Central Electricity Generating Board
CIR	Commission on Industrial Relations
ECI	Engineering Construction Industry
EEF	Engineering Employers' Federation
EETPU	Electrical, Electronic, Telecommunications and Plumbing Union
FTO	Full Time Official
GMWU	General and Municipal Workers Union
NAECI	National Agreement for the Engineering Construction Industry
NECEA	National Engineering Construction Employers' Association
NEDO	National Economic Development Office
NJC	National Joint Council
OCPCA	Oil and Chemical Plant Constructors' Association
PJC	Project Joint Council
TICA	Thermal Insulation Contractors' Association

Glossary of Contract Terms

Types of Contract

There are two main dimensions to a contract - basis of payment, and scope of work. Distinctions within both dimensions need to be made.

1. Basis of Payment

a. Fixed Price/Lump Sum

Here a contractor bids a price for a defined piece of work. When a bid is accepted by the client the price quoted by the contractor becomes the 'fixed' amount of money that the contractor will receive.

b. Schedule of Rates

Here a contractor bids a price for a less well defined piece of work on a pro rata basis, e.g. for a job said to involve approximately 4,000 metres of piping, the contract will involve a price per metre of piping which will be paid for each metre above this amount.

c. Reimbursable

In its simplest form a cost reimbursable contract provides for

the reimbursement of the contractor's actual on-site costs, and for the payment of a fee which will include overheads and profits.

2. Scope of Work

a. Design/Engineering

The client gives information to the contractor concerning the process required of the finished plant (or a particular part of the plant) and from this the contractor designs/engineers appropriate drawings.

b. Procurement

This area involves taking responsibility for the manufacture and/or arrival on site of pieces of plant which will be assembled in the construction of the plant.

c. Construct

Here the contractor is responsible for assembling on site the plant items in line with the design drawings.

Types of Contractor

1. Managing Contractor

A managing contractor is an external organisation appointed by the client to manage and co-ordinate the design and construction phases of a project.

2. Turnkey Contractor

Effectively a sub-set of management contracting, here detailed design, construction and management are undertaken by one contractor. This contract is paid on a lump sum basis.

3. Direct Contractor

A direct contractor is one who does not undertake managing contracting functions, is concerned with construction, and has a direct contract with the client.

4. Sub-contractor

A sub-contractor has no direct contract with the client, but is appointed by another contractor to undertake a piece of work.

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CHAPTER ONEFROM INDUSTRIAL RELATIONS TO THE POLITICAL ECONOMY OF PRODUCTION1.1. Introduction

Industrial relations in the UK, both as a field of study and as a practice, is in crisis. Apparently stable institutions and assumptions are being put into question. Whilst departments of industrial relations in Universities in the country are increasingly subsumed into business studies or are redefined as departments of human resource management, levels of unionisation continue to decline, management at greenfield sites seek single union 'no strike' agreements, and the latest survey of workplace industrial relations concludes that it is now no longer possible to speak of a single system of industrial relations in the UK (Millward et al., 1992).

This chapter argues that the root of this crisis is the break-up of the Keynesian management of the macro-economy, the break-up of markets, and changing nature of international competition. The crisis in industrial relations as a field of study stems from the disintegration of the concept of industrial relations as a distinct and separate social area, and suggests two alternative forms of development - a transformation into the study of human resource management within the increasingly unitarist study of businesses and management, or a transformation into the study of the political economy of production which allows for an

understanding of social relationships as power relationships.

This thesis, by examining the relationship between industrial relations and economic performance, using the engineering construction industry as a case study, seeks to contribute towards the development of the study of the political economy of production.

The first substantive section of the chapter highlights the crisis in industrial relations and articulates the consequent importance of studying the links between industrial relations and economic performance. The final section outlines the structure of the thesis, and the central points addressed in each chapter.

1.2. Crisis in Industrial Relations

As Hyman (1989:120) has noted, 'the very term 'industrial relations' is indicative of the character of the subject which it denotes. It forms an area of study with no coherent theoretical or disciplinary rationale, but deriving from a directly practical concern with a range of 'problems''. And yet given that the study of industrial relations did flourish this indicates that there was a perception of industrial relations as a distinct social area. The seminal statement of this perception was Dunlop's 1959 book, Industrial Relations Systems, which gained widespread currency in the UK and the USA. Dunlop argued that a distinct industrial relations system could be identified

as existing, bounded by, but largely separate from, the realm of technology, the market, and the nature of power in the larger society.

Prevalent at the same time was the thesis of convergence of the characteristics of advanced industrial societies proposed by Kerr et al. (1960). While the main thrust of the convergence thesis concerned the nature of wider social stratification the argument also applied to the characteristics of industrial relations - as Goldthorpe (1984:322) notes, 'their expectation clearly was that as labour unions 'matured'.... and concentrated their efforts on pragmatic collective bargaining and pressure-group activities, they would come to form a quite integral part of pluralistic industrialism'.

These concepts of a semi-autonomous industrial relations system and of a convergence of industrial relations' characteristics are related. Underlying each was the particular material context of the form of political economy established in the leading capitalist countries in the post-war period.

The important elements in this post-war political economy were Keynesianism, mass production and primarily economistic trade unions. The conditions of full employment (central to Keynesianism), pattern wage bargaining (see Piore and Sabel, 1984:80-84), and unsaturated mass markets in effect set a context which both allowed observers to argue that industrial relations were separate from the economic sphere, and further that there

were increasing similarities in the advanced capitalist countries in the institutions of industrial relations. Yet, what appeared as a form of autonomy was in fact a particular, temporally specific, type of relationship between industrial relations and the economy, and what appeared as a trend towards convergence was in fact a configuration specific to the post-war period and strongly influenced by the strong role of the USA politically in the immediate post-war period.

As divergence in economic performance of the competing advanced countries became manifest, and as divergences in the nature of their industrial relations became manifest, so the thesis that industrial relations existed as a distinct and separate social area was increasingly put into question.

The form of the political economy of the post-war settlement can be broadly characterised as one of 'pluralistic industrialism' (Goldthorpe, 1984:322), in which trade unions were accepted as legitimate actors, full employment was guaranteed, and labour movements turned their attention away from political goals towards regulating wages. These were the key characteristics that emerged from the New Deal settlement in the USA. The USA played an important sponsoring role in creating this form of political economy, in a sense equalising the social costs that underlay international competition. Keohane (1984:16) notes 'how conditions in the world political economy and American policy during the 1950s and early 1960s facilitated European economic growth and reduced the severity of dilemmas facing European

governments seeking to combine capitalism, increased openness with respect to the world economy, and social welfare'. The AFL-CIO and the USA government objected to the entry of Spain into the international system of free trade unless free trade unions were established in the country. General McArthur deposed the socialist government in Japan in 1947. The AFL-CIO objected, albeit unsuccessfully, to the establishment of co-determination in West Germany.

There were a number of contradictions and tensions within this form of post-war political economy. Keynesianism was primarily based upon a model of a closed economy. With the internationalisation of markets the level of penetration of imports into domestic economies increased and the option of reflating the domestic economy became increasingly unavailable (the clearest manifestation of this being Mitterand's failed attempt to reflate the French economy to full employment in the early 1980s). The existence of full employment allowed trade unions to increase their demands in both economic and political terms - there emerged 'a new 'maximising' militancy in collective bargaining, encouraged.... by the weakening of traditional legitimations of class inequalities.... as well as by the rising confidence of trade unionists in the bases of their organised power', in the words of Goldthorpe (1984:322), or in the words of Skidelsky, there was a 'breakdown of the market and social disciplines that previously restrained wage demands' (1979:69). Therefore, the state in many advanced capitalist countries sought to bargain with trade union leaders in a form of neo-corporatism.

*what was
casualty?*

Another important consideration was that whilst social costs were broadly equalised at the level of competing countries, the incentive existed for individual firms within countries to seek to move from production entailing adversarial economic trade unions. The actions of individual firms were able to transform the systems of industrial relations within countries. Within the USA, the sponsor of the form of pluralistic industrialism, firms sought to exclude trade unions. This led to substantial falls in the level of union density in the USA. In Japan, firms were increasingly able to mould trade unions away from adversarial economic towards a form of incorporated enterprise union. In instances this entailed the deliberate policy of firms in breaking socialist trade unions and creating company unions. The case of West Germany is more difficult to characterise, but it is clear that the system of co-determination led to a form of industrial relations very different from a pluralistic industrialism.

In short, the equalising of social costs in the post-war political economy broke down. As divergences in the nature of industrial relations emerged so did divergences in the economic performance of the competing advanced capitalist economies. The Japanese economy grew rapidly, the West German economy performed well on a number of indicators, France performed less well, whilst the economic performance of the UK was poor relative to the other advanced capitalist economies.

This increasing divergence in both industrial relations and

moment had
 economic performance between countries has led to a re-awakening at a number of levels in the examination of the links between industrial relations and economic performance. Increasingly, Dunlop's concept of an semi-autonomous industrial relations system became untenable. The intimate and complex connections between politics, the market and technology and industrial relations became more difficult to ignore.

The consequent academic re-examination of the relationship between industrial relations and the economy has taken two main forms. The first form is the redefinition of the study of industrial relations as the study of human resource management. Implicit in human resource management is the concept that the nature of employee relations is a key determinant of economic performance, such that long term strategies towards employees, fostering loyalty and cooperation, should form an important part of the wider business strategies of firms. Just as the practice of human resource management in production is the attempt to create such an integration of strategies so the study of HRM has increasingly focused on integrating market and personnel strategies and on the methods of creating cooperation and loyalty. Hyman is clear on the consequences of such a redefinition :- 'one response is to redefine industrial relations in terms of the management of the employment relationship.... the job description of the industrial relations scholar-consultant is then unambiguously to aid, advise and reinforce management in exerting unilateral control over the workforce' (1989:12-13).

There are a number of problems with a redefinition of industrial relations as HRM. As Hyman implies, there is a strong managerialist, and hence unitarist, core to HRM. It does not allow for a conception of the employment relationship as a misbalanced power relationship in which management seeks to exert control in translating the labour power purchased at the point of contract into actual labour within the production process. Moreover, such a redefinition falls prey to a similar fault that underlay Dunlop's project - that of conceptualising A particular form of the relationship between industrial relations and economic performance as THE form. It is no coincidence that the stress upon creating loyalty and cooperation amongst employees has arisen alongside a shift in the form of competition away from price-based mass markets towards quality-based niche markets. But to characterise the whole of the UK economy as being subject to such a fundamental shift in the form of competition is clearly mis-placed (see Nolan and O'Donnell, 1991). In accepting such a redefinition of the field of study, academic institutions are allowing the agenda to be set by so-called 'leading edge' firms. The evidence from the latest workplace industrial relations survey shows that the large and growing non-union sector in the UK economy, rather than being characterised by sophisticated HRM policies, is characterised by low wages, poor levels of training, more accidents, greater unilateral management authority, and greater insecurity of employment (Millward et al., 1992). To accept a redefinition of industrial relations as a study of HRM is to ignore the realities of the contemporary nature of production relations in the UK.

11.6.1992

An alternative analytical response to the re-examination of the relationship between industrial relations and the economy is to reconceptualise the issue as one of political economy.

The apparent dichotomy between examining power relations, or politics, within production, and examining the economics of production would not have been recognised by writers before the neo-classical introduction of marginalist concepts. Adam Smith and Karl Marx both wrote as political economists, understanding the connections between politics and economics such that it was not useful or possible to analyse them separately. The neo-classicists sought to de-politicise the study of political economy, introducing concepts which denied the relevance of concepts such as power. The establishment of strict barriers between the academic study of politics and economics can be seen as mirroring the covert nature of exploitation within capitalism.

However, it is now appropriate with events in recent decades bringing into sharp relief the connections between politics and economics to reassert the relevance of the study of political economy. This leads to the question of how far it is legitimate to define the political economy of production as a useful focus of study. Hyman has argued that it is more useful to redefine the subject of study as 'the political economy of industrial relations' (1989:133).

Hyman implicitly argues that 'industrial relations' remains a useful term in focusing attention upon the institutions that

mediate the capital-labour relationship :-

'the state of industrial relations.... cannot be simply 'read off' from a generalised characterisation of the economic and political conjuncture.... what is at issue is the specificity of institutions and processes of mediation which are in some respects distinctive.... [and] it is correct to insist that this is a level of social relations which partially follow their own (contradictory) laws of development, and which accordingly require serious analysis in their own right. But.... it is fallacious to exaggerate the autonomy of the processes of institutional mediation of the capital-labour antagonism' (1989:135).

But this raises the question of whether this is referring to the institutional mediation of the capital-labour antagonism in all of its manifestations. Such a reference is more applicable to the more general field of political economy and does little to aid useful sub-divisions of the field of political economy. Early in his article, Hyman, himself, in a criticism of conventional industrial relations writers provides an important criterion in creating such a sub-division :-

'it is ironical that conventional writers on industrial relations have developed often sophisticated discussions of 'job regulation' and 'systems of rules' without any apparent recognition that the elaborate procedural and institutional superstructure on which they focus has its foundation

justification in the USA by comparing the performance of unionised firms with the performance of non-unionised firms, and finding that under certain conditions unions had a positive impact upon productivity but a negative one upon profits. In the UK, research using similar methods has been undertaken and has been used by the Conservative government in a White Paper to justify legislation aimed at weakening trade unions :-

'recent research shows that trade unions have used their powers in ways which adversely affected labour costs, productivity and jobs. Managements who recognised and negotiated with trade unions were more likely to suffer job losses than managements which did not. In general, trade unions tended to push up earnings of people they represented while blocking improvements in productivity which are needed to pay for these higher earnings' (Employment for the 1990s: 15).

This thesis seeks to engage with this debate, and thereby contribute towards a better understanding of the nature of the relationship between politics and economics surrounding production, or, in other words, to contribute towards a more adequate understanding of the political economy of production.

1.3. The Study

This study engages with the debate on the effects of unions upon economic performance at the micro-level, with a primary focus on

the UK literature. It contributes to the debate by examining the extant literature, by putting forward the findings of original research undertaken, and by relating these findings to the literature.

Chapter 2 examines the literature. It spells out the arguments of the two main schools of thought in the area - the neo-classicists and the Harvard school. Whilst there are important theoretical differences between the schools they share a common research method - the production function approach. A review of the UK evidence, defined within the terms set by the two schools, suggests apparent, fragmentary support for the argument, put forward by Prof. Metcalf (1989), that powerful unions in the 1960s and 1970s impeded productivity levels. However, through putting forward important criticisms of the existing research a counter-argument is constructed which stresses the importance of examining the social organisation of production, rather than of adopting a one-sided focus on unions. Recognising the limitations of statistical models in examining social processes it argues the need for case study research.

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Chapter 3 elucidates why the engineering construction industry (ECI), 1960-90, was chosen as the site for a case study. The ECI involves the design and construction of large power stations and petro-chemical plants. The industry was subject in the 1960s and 1970s to both extensive delays against construction schedule, and a high level of labour militancy. In the 1980s the performance of the industry improved substantially, whilst militancy fell.

As such, the industry constituted a 'crucial case' (Mitchell, 1983) for the argument that labour militancy underlay poor performance in the wider UK economy. It is further argued that the ECI is a useful site for a case study because its organisation of production, with firms coming together on a project basis and with firms flexibly reconstituting themselves, can be seen as prototypical for wider sectors of the UK economy. Moreover, examining the capital relations of the ECI allows an analysis of the usefulness of the Williamson (1975, 1985) approach to the evolution of economic institutions of capitalism. The third chapter also details the research methods undertaken, highlighting the interview and archive research undertaken.

Chapter 4 presents the data on economic performance in the industry. The measure utilised is performance against construction schedule. This is an extensive measure of performance relevant to clients in the industry. This measure has the advantage of addressing issues of non-price competitiveness which are ignored in the extant literature. The chapter shows the checks for bias in the data that were undertaken. The screened data show that overruns existed in the 1960s and 1970s, and that a major improvement occurred in the 1980s. The task of the following 4 chapters is to explain this change.

Chapter 5 examines capital relations and economic performance in the 1960s and 1970s and argues that opportunistic practices of contractors were at the root of the long delays of the period.

This argument is based both on an examination of secondary sources and on interview research with contractors at 4 large sites. The primary evidence on contractors' opportunism is laid out in relation to terms which have common currency within the industry - 'extras/on day rates', 'underbidding', 'sitting on the job', and 'commercial bias scenario/withholding information'.

Chapter 6 argues that the improvement in the 1980s was at root due to the emergence of managing contractors who were able to curb the opportunistic practices of contractors. In principle, managing contractors can adopt two routes to improving economic performance - the high trust route and the low trust route. The high trust route involves an integration of design and construction, a sharing of information and costs and managing contractors undertaking direct construction themselves. The low trust route involves a rigidification of design, the separation of design and construction, and managing contractors pursuing a strategy of passing on risk. The low trust route implies more of a 'step' improvement in performance than a foundation for longer term economic development. Managing contractors in the UK in the 1980s adopted the low trust route. It is also argued that whilst the Williamson framework provides a basis for understanding the rise of managing contractors, the assumption of opportunism as a fundamental behavioural characteristic makes the approach less useful in examining the distinction between low trust and high trust routes.

The seventh chapter turns to examine the role of labour relations

in performance outcomes in the 1960s and 1970s. Evidence, in the form of archive and secondary materials, shows that high levels of site autonomy and militancy existed in the decades. The militancy exacerbated the schedule overruns. However, its central importance was that contractors were able to use militancy to reproduce the form of commercial relations which underlay the chronic overruns. Occasionally, contractors would even foment strikes to further their commercial objectives. The militancy was to an important degree a reaction not to any intensification of work but rather to the uncertainties and inefficiencies created by contractors' focus on profit outwith production.

Chapter 8 details the fall in the level of militancy in the 1980s, and reversal in the flow of authority in trade unions to a position of the primacy of national official power. It is argued that the slump in demand, the curbing of opportunism, and the introduction of a comprehensive national agreement all underlay these changes. The fall in militancy facilitated the strategy of managing contractors in curbing opportunism. Further, the NAECI had important direct effects on the commercial arena, also facilitating this strategy.

The final chapter recapitulates the argument and relates it to the points developed in chapters 2 and 3. Specifically, it is argued that a number of points concerning research methods are borne out by the findings which emerge from a case study approach. The point that managing contractors, unconstrained by

labour militancy, adopted the low trust route suggests that arguments that management unconstrained will make optimum decisions are misconceived. The central conclusion is that the validity of the British worker question must be put into serious doubt. It is argued that the specific form of relationship between opportunism, militancy and poor performance in the ECI in the 1960s and 1970s could have wider resonance in important industries in the period - shipbuilding, docks, construction, aerospace and wider engineering.

CHAPTER TWOINDUSTRIAL RELATIONS AND ECONOMIC PERFORMANCE - THE EXTANT LITERATURE2.1. Introduction

This chapter will critically review the academic literature which addresses the relationship between industrial relations and economic performance. The main form that this literature has taken is one of a production function statistical study between unionisation and economic performance measures. Three key criticisms will be advanced. Firstly, technical limitations in existing studies will be highlighted. Secondly, limitations in statistical studies in examining social process will be shown. Finally, it will be argued that there are theoretical problems with the production function approach. In the process of making these criticisms relating to method, substantive points will be made concerning the role of unions in affecting economic performance, primarily in the 1960s and 1970s.

The existing academic literature can be divided into two schools of thought - the neo-classicists and the advocates of the Harvard approach. These schools were first outlined in the USA and the categorisation of the leading UK protagonists in terms of the two schools is less straightforward but still useful. While there are theoretical differences between the two schools the production function method of correlating a unionisation variable

with economic performance variables is common to both.

2.2. The Neo-Classical and Harvard Schools

It is worth considering why the debate has focused on the role of trade unions in affecting economic performance. The previous chapter noted that the demise of Keynesianism meant that unions were left without a macro-economic role. At the same time, rates of unionisation in the USA fell substantially. As such, the debate in the USA has sought to influence public policy, with the Harvard school being broadly pro-union, and the neo-classicists being anti-union. Similarly, the political nature of the debate in the UK is underlined by the statement from the Government White Paper quoted in the previous chapter.

The Neo-Classical School

The conventional neo-classical approach is centrally informed by the conceptualisation of unions as a monopoly force which distorts the operation of market forces and causes a mis-allocation of resources. By creating a monopoly in the labour market unions force up the price of labour. This causes unionised firms to substitute physical capital for labour. The employees who were laid off are re-engaged by non-union firms at lower wages in less productive, more labour-intensive industries. Note that it is assumed that the productivity in the union sector will be higher because of the greater capital-intensity of that sector. However, the overall effect of unionisation is presumed

to be harmful in that it is assumed that the allocation of resources prior to unionisation was optimum. Unions as a monopoly force lead to a mis-allocation of resources. The stress here is on the sphere of exchange. Indeed, the neo-classical approach effectively ignores the sphere of production. It assumes that the production outcomes flow automatically from the technical combination of particular inputs of labour.

The implication for the method of social enquiry of this approach is that a statistical comparison of union and non-union firms and their performance outcomes, while statistically controlling for other relevant variables, most importantly the capital-labour ratio, is the most appropriate method of examining the union effect. Controlling for the capital-labour ratio is central to the production function approach. The production function approach 'traditionally makes output per worker depend on capital per worker [i.e. capital-labour ratio], other inputs used per worker, and indicators of the quality of the workers.... To determine the effect of unionism on productivity, one adds to the traditional variables a variable giving the fraction of the workforce that is unionized. In statistical analyses the estimated effect of the fraction unionized reflects what unions do to productivity above and beyond changes in the amount of physical inputs used per worker' (Freeman and Medoff, 1984:165) (see Note 1). Further, within this theoretical approach there is no need for a case study examining the processes of the causal mechanisms involved. The causal mechanisms are specified a priori.

In relation to the neo-classicists ignoring the sphere of production, Leibenstein (1976) noted that the basic assumption of the neo-classical model, that every firm utilises all of its inputs 'efficiently', was invalid, and introduced the concept of 'X-efficiency' in elaborating how the relationship between inputs and outputs was not a determinate one. The concept of 'X-efficiency', however, is effectively little more than a residual label highlighting a major inadequacy in the neo-classical approach, and it has little analytical utility. The inability of the neo-classical school to deal with issues relating to the production process means that writers are forced into ad-hoc arguments concerning the possible negative union effect on efficiency in production. For instance, Hirsch and Barnett point out that 'it has been argued that union restrictive/protective practices are potentially a much greater source of output loss than their relative wage effects' (1986:184), but this is merely asserted and there is no attempt to ground it in the neo-classical theory of perfect competition, nor indeed within any other theoretical construct.

In so far as neo-classical writers do adopt arguments concerning the union effect within the sphere of production (and they do - see Hirsch and Barnett above, and Metcalf, 1989) it is no longer the case that causal processes are specified a priori. This suggests that the method of enquiry should also be concerned with investigating the social processes involved.

The Harvard School

The Harvard approach was primarily defined by Freeman and Medoff in a book and a series of articles in the late 1970s and early 1980s. The Harvard approach effectively constitutes an institutionalist revision to the neo-classical approach, seeking to embrace issues concerning the sphere of production as well as the sphere of exchange. They put forward a theoretical approach in which unions could be expected to have a positive effect on economic performance. They argue that there are two faces of trade union behaviour. The first face is the monopoly face associated with the union's 'monopolistic powers to raise wages', and the second is the 'collective voice/institutional response face, associated with their representation of organised workers within enterprises' (1984:6).

The concept of the monopoly face of unions exactly follows the neo-classical line of reasoning. Unions constitute a monopoly which raises wages, leading to a substitution of capital for labour in unionised firms. Productivity is higher in unionised firms but this is socially harmful. To control for this substitution effect it is necessary to control for the capital-labour ratio through the production function method.

They argue that also associated with the monopoly face of unions are 'restrictive work rules' (1984:163). This facet which lowers productivity is unlikely to be of long-term significance, however :- 'while under some circumstances unions may use their monopoly

power to lower productivity through restrictive work practices, competition in product markets is unlikely to permit such practices for very long except in markets sheltered from competition' (1984:164). Nevertheless, this element of the monopoly face, acting within production, suggests the utility of research methods which are able to examine social processes.

Freeman and Medoff argue that the 'collective voice/institutional response' face of trade unions will tend to raise productivity, and in a way which is socially beneficial. They follow Hirschman (1970) by arguing that there are two basic mechanisms for dealing with social or economic problems - the classic market mechanism of exit and entry, and the political mechanism of voice. To the extent that employees do choose the voice option, the expression of the voice will necessarily be collective rather than individual in nature because of both the existence of public goods within the workplace and the existence of the authority relationship within employment, such that individual workers may fear reprisals if they express dis-satisfaction to the employer. They continue by arguing that the union fulfils the function of a collective voice. Unions as political organisations will tend to sum individual preferences such that they will tend to express the preference of the average worker. Under the exit option it is the preferences of the marginal worker which are expressed to the employer. However, because the marginal worker, i.e. the worker who uses the exit option, is 'generally young and marketable', the firm tends to ignore the preferences of the typically older, less marketable workers. Freeman and Medoff

argue that because unions sum the preferences of all the workers the ensuing union contract 'can be economically more efficient than the contract that would result in the absence of unions' (1984:10). They give the example of reduced turnover as an economic benefit of the collective voice which unions represent :- 'for example, reductions in turnover due to unionism raise productivity by lowering costs of training and recruitment. In industries like construction, productivity gains result from unionized apprenticeship programs that produce better workers' (1984:164).

A further element in the second face of unionism is the concept of institutional response or shock effect. Here, unions may have a positive impact upon management, whereby 'because of incomplete information, lack of coordination in an enterprise, and organisational slack, management can respond to unionism in more creative ways, which can be socially beneficial' (1984:11).

They state that in the examination of the effect of unions on productivity it is important to recognise that what is being examined is not unions in isolation, but unions in a relationship with management. This institutional response element of the Harvard argument is a serious attempt to advance understanding in that it not only stresses the importance of union-management interaction, but also because it lends itself more easily to a dynamic analysis of capitalist development, as opposed to the essentially static approach inherent in the neo-classical concept of the market equilibrium (see Nolan and Marginson, 1988).

The argument that 'unionism per se is neither a plus nor a minus to productivity. What matters is how unions and management interact at the workplace' (1984:179) is important. It suggests that a method involving statistical comparison of union and non-union outcomes cannot tell us about the causal mechanisms involved in the association of a unionisation variable with a particular performance outcome variable unless there is also an attempt to operationalise the concept of union-management interaction in the form of a variable in the production function equation.

In the UK Nolan and Marginson (1988) have been the leading critics of the neo-classical approach, and in their critique of the neo-classical school they stress the strengths of the Harvard approach :- 'it is possible to identify a rich and enduring tradition of dissent.... which has maintained a different perspective on unionism.... most recently this tradition has found expression in the empirical studies of unionism in the United States by economists at Harvard.... in our view the best examples.... are extremely impressive and cannot be dismissed' (1988:2-3). They stress the virtues of the Harvard approach in introducing a dynamic focus into the debate though the concept of the 'shock effect' in which management is forced into adopting 'the most productive techniques' by unions.

How does this differ from neo-classical approach about unions → productivity?

They differ from the Harvard approach by putting an understanding of the power relationship inherent in the employment relationship at the core of their approach :-

'The [neo-classical] theory is premised on the idea that the employment relationship would be characterised by shared interests, harmony and cooperation in the absence of unions. Yet such a view is at odds with the findings of.... writers who have shown that output restrictions and conflicts in the workplace predated unionisation and are a continuing feature of non-unionised settings. The roots of these practices are to be found.... in the character of the employment relationship' (1988:2).

It will be recalled that Freeman and Medoff note the existence of the authority relationship in employment when discussing the need for a collective rather than an individual voice. They locate the origins of the authority relationship in the uncertainties which are peculiar to the employment contract and which distinguish it from other types of contract. Whilst they claim to be following Marx in stating that the 'essence of the employment relationship under capitalism.... is the payment of money by the employer to the employee in return for the employer's control over a certain amount of the worker's time' (1984:10), they fail to develop this analysis into an awareness of the differentiation between labour and labour power, and the inherent conflict of the employment relationship in capitalist production. Thus, whilst Freeman and Medoff acknowledge the existence of a power relationship they fail to examine the nature and consequences of the relationship.

This review of the two schools has shown that there are important

theoretical differences between the two schools. There are, however, important commonalities. In particular, the Harvard school's concept of the monopoly face of unionism exactly parallels the neo-classical understanding of unions as constituting a monopoly which distorts market forces. This common thread allows the schools to share a common research method - that of production function analysis. When Freeman and Medoff write that the 'empirical question is whether productivity-augmenting or productivity-reducing behaviour dominates' (1984:165) they write with the assumption that examining the 'empirical question' can be done by an uncontested method.

*Economic
Unionism*

2.3. The Evidence Reviewed

This section reviews evidence for the UK. For reasons of space and because comprehensive discussions exist elsewhere (see Nolan and Marginson, 1988; Metcalf, 1990; Brown and Wadhvani, 1990) the aim is not to provide a comprehensive overall examination of the evidence. Rather the aim is to focus on the stronger studies (see Note 2) which have been interpreted by Metcalf (1989, 1990) as supporting his arguments. As such, the focus is primarily upon Machin (1987), Nickell et al. (1989), and Machin and Wadhvani (1989). These studies analysed company and plant level data. None of the studies can claim to be statistically generalisable to a wider population.

In examining Metcalf's claim that evidence supports his arguments, it is important to see that the core of his argument does not rest on a view that unions will always impede performance. Therefore, Nolan's observation that the Nickell et al. (1989) study 'casts further doubt on Metcalf's claim that unions lower productivity' (1992,:12) seems to rest on a misinterpretation of Metcalf's argument.

Metcalf has sought to refine the a priori neo-classical argument that unions will always harm economic performance. Rather, the suggestion is that unions will harm performance primarily in circumstances which grant them excessive power (although note that Metcalf's understanding of the nature of this power is highly problematic - see Note 3). This is essentially the concept underlying Metcalf's discussion of why the political and economic context of the 1970s which granted unions power undermined the Donovan proposed reforms which were meant to allow for a form of bargaining which would alter the negative impact of unions on performance (Metcalf, 1989:5-10). Collective labour organisation per se is not identified as the impeding agent, but rather collective labour organisation with excessive power. This leads to the argument expressed by Metcalf that the context of the 1980s, with its industrial relations legislation aimed at regulating and weakening trade unions, with its severe and prolonged recession, and with its heightened competitive environment, led to important industrial relations changes which underlay the 'productivity miracle' of the 1980s. Implicit within this is the expectation that unionised workplaces should

experience superior economic performance in the 1980s following their inferior performance in the 1970s, a period when collective labour organisation, according to Metcalf, was powerful.

Therefore, the evidence from the Nickell et al. (1989) study that unionised establishments experienced superior productivity growth in the 1980s, and inferior growth in the 1970s can be used to support the Metcalf argument. Machin's (1987) study of 52 engineering firms is more ambiguous in relation to the Metcalf argument. Machin's sample of 52 engineering firms contained only one non-union firm, and he found positive associations between union density and productivity levels in seven firms, and a negative one in eleven firms. Within this small sample the negative union association is confined to larger firms. *Research*

Further support for the Metcalf argument is apparently provided by Machin and Wadhvani's (1989) study, based on a sub-sample of firms from the 1984 Workplace Industrial Relations Survey. Wadhvani argues that this study examines productivity change :- 'the measures of productivity change.... in WIRS.... is obtained as an answer to a question' (1990:375). However, this is misleading. The Machin and Wadhvani (1989) study does not measure productivity change, rather it examines how far unionisation affected whether an establishment experienced organisational change. Whether organisational change led to productivity change is an open question, and the study does not address it. The key finding of the study is that union recognition was associated with greater organisational change in

the 1980s but only if the relevant sector also became less concentrated. Organisational change is defined in the WIRS questionnaire as 'substantial changes in work organisation or work practices not involving new plant, machinery or equipment'. The authors interpret organisational change 'as denoting the removal of some restrictive practices' (Wadhvani, 1990:374).

Metcalfe can seek to use this study to support his argument because it apparently both provides evidence on the route by which unions adversely affect performance, and provides evidence that collective labour organisation has a particular effect where it is powerful (power here deriving from product market conditions). It was noted that neo-classical writers have resorted to ad-hoc arguments concerning the union imposition of 'restrictive practices'. The Machin and Wadhvani study apparently provides evidence that unions did create 'restrictive practices'.

At present the counter-arguments to Metcalfe's thesis lie at too high a level of abstraction. Nolan (1989) on productivity improvements in the 1980s, argues that the improvements arise from a one-off rise in the intensification of labour and from changes in the organisation of work, and makes the point that such improvements do not necessarily constitute improvements in efficiency (understood in the technical sense). However, he is unable to provide evidence to support this point. Further, Nolan does not centrally address the question of the poor productivity record of the UK in the 1960s and 1970s, although

he does discuss 'the sources of productivity weakness in the past' (1989:110). Here he states that,

'the social agencies and pressures which might have led to the establishment of a high-wage, high productivity industrial system have been weak, and ambiguous in their effects. The key social agencies in question are the state, the trade unions and industrial capital.

In stressing the effects of particular social agencies in Britain, the aim is not to reproduce the argument that productivity growth has been obstructed by powerful institutional 'rigidities'. The argument, rather, is that the agencies which might have generated the pressure for change have been too WEAK' (1989:111).

This is a potentially interesting and persuasive argument but as it stands is at too high a level of abstraction to aid an understanding of the particular question of the UK's poor productivity record in the 1960s and 1970s.

How?
 This section has stressed the fragmentary and ostensible nature of evidence which Metcalf has used to support his position. An examination of the problems with Metcalf's interpretation of the evidence needs to be grounded in an understanding of the nature of the research methods. The following section, therefore, puts forward criticisms of the research methods underlying the debate, and also constructs a more detailed counter-argument to the

Metcalf thesis, with the primary focus on the 1960s and 1970s.

2.4. Criticisms of Research Methods

Three main forms of criticism are put forward - technical limitations with existing studies, the limitations of statistical studies in examining process, and theoretical problems with the production function approach.

A. Technical Limitations with Existing Studies

Failure to Model for Management

If production is seen as a social process in which workers, unions and management take part it is clear that to seek to ascribe causal significance to unions it is necessary to include a variable operationalising management behaviour. Yet none of the UK studies includes a measure for management behaviour.

Freeman and Medoff state 'unionism per se is neither a plus nor a minus to productivity. What matters is how unions and management interact at the workplace' (1984:179). Further, 'if management uses the collective bargaining process to learn about and improve the operation of the workplace and the production process, unionism can be a significant plus to enterprise efficiency. On the other hand, if management responds negatively to collective bargaining.... unionism can significantly harm the

performance of the firm' (1984:12). Even Hirsch and Barnett recognise the need to examine management. They criticise studies which do not adequately report or measure nonunion labour inputs, such as managerial supervision. Without these measures 'one cannot disentangle the direct effect of unionism per se from its indirect effects via management response' (1986:194). Nolan and Marginson apply this point of criticism with reference to Machin's 1987 study :-

'no attempt is made to control for variations in management performance. Thus it remains possible that the lower productivity levels in large plants were as much to do with the behaviour of management as with unions.... without additional information on management it is impossible to ascertain whether or not unions had a direct CAUSAL effect on performance' (1988:4-5).

This argument also clearly means that when Metcalf uses the extant evidence to support arguments concerning the causal effect of unions (and he does - see Note 4), his approach is misconceived.

One study in the USA attempted to model for management. Clark (1980b) undertook a longitudinal study of the effects of unionisation on cement plants. He used the variable of the ratio of supervisory to direct production manhours in order 'to disentangle the direct effect of unionism from its indirect effects via management response' (Hirsch and Barnett, 1986:199).

In principle it is possible to model for management behaviour. However, it is problematic because management response to unions is a complex and multi-dimensional concept. Management can seek to bargain at the multi-employer, industry, corporate or plant level; they can seek to limit the scope of bargaining to wage issues or they can consult with unions on new technology or investment; they can seek to deal with the union through direct opposition, proposing a unitarist framework, through a form of pluralist-adversarialism, or through an attempt to incorporate unions into sharing concerns over profitability; they can seek to bolster the official structure of the union by only dealing with FTOs and refusing to recognise shop steward committees, or they can encourage lay representation; they can undertake a strategy of relative autonomy or of direct control (see Friedman, 1977) in the workplace; they can seek to offer workers guarantees of employment, or they can contract-out work and introduce a form of casualisation.

Arguably, Clark's operationalisation of management response attempts to probe the issue of the strategy of relative autonomy or direct control. Even at this level problems remain. As Friedman (1977) makes clear, management can simultaneously pursue a strategy of relative autonomy on some issues and of direct control on others. Therefore, to simply point out a change in the ratio of supervisory to direct production hours is by no means to point out that there has been an overall change in managerial strategy between relative autonomy and direct control. It is a concept which can be best examined through detailed,

qualitative research.

Endogeneity

The issue of endogeneity was first raised by Addison and Barnett (1982), leading neo-classicists in the USA. It is necessary to place their criticism in the context of the USA in which the early studies reported by Freeman and Medoff (1984) tended to find unions positively correlated with productivity outcomes (though negatively with profits). They state 'our suggestion is that unionism is an endogenous variable, not determining productivity in those cases where a significantly positive effect of unionism is obtained but, rather, being jointly determined with productivity' (1982:145). Their argument is that the benefits Freeman and Medoff ascribe to the union's collective voice are very similar to the benefits which Williamson ascribes to the development of the internal labour market, i.e. both 'perform functions to attenuate these hazards of unconstrained trading' (p.149) in circumstances of idiosyncratic jobs. 'The upshot of this is that if unions do have the beneficial productivity characteristics ascribed to them by Harvard analysts they will presumably be jointly determined with idiosyncratic job markets' (p.150).

This is an argument that unions and idiosyncratic job markets are jointly determined. In order that this may result in a systematic bias in the union correlation it is necessary to then argue that idiosyncratic job markets exist in firms which are

more productive. However, they do not seek to make this point. This is a major gap in the argument. The continuation of their argument relies on the point that the Harvard studies have not 'clearly established that the firms in question are competing in the same markets' (p.151). The tenuous implication here is that idiosyncratic jobs will exist for certain product markets, that firms in these markets will be more productive, and that these firms will tend to be unionised.

Freeman and Medoff acknowledge the possible importance of endogeneity :-

'individuals or firms with similar measured characteristics are unlikely to be unionized on a random basis. If individual or firm X gets organized and individual or firm Y does not, there is probably some difference between them that explains their different unionization history. This uncaptured 'pre-union difference' may explain part of the outcome difference that we attribute to unionism' (1984:23).

The key point is made by Brown and Medoff (1978) - endogeneity may exist but there is no sound basis on which to assume that unionisation is jointly created with more efficient or profitable firms. In relation to their own study they argue that for the endogeneity bias argument, 'one must assert that within a given region, in a given two-digit industry, focusing on firms of a given size, unions organize the most productive firms. While such a conjecture seems plausible, previous studies of the determinants of unionization do not support this view'

(1978:374).

It is noteworthy that the issue of endogeneity has only been raised by neo-classical writers in terms of unions being jointly created with highly productive firms, but it has never been raised to explain studies which find unions negatively associated with productivity.

There is another way in which the issue of endogeneity is worth considering in relation to the UK, however. The issue here does not concern the origins of unionisation but rather the origins of militancy, where militancy is defined as encompassing both strike action and a high level of job controls.

It will be recalled that a number of studies operationalise collective labour organisation through measures of strike activity. Further, in the USA Ichniowski (1983) sought to examine the effect of the number and complexity of union rules on productivity (with work rules proxied by the number of pages in collective bargaining agreements). Therefore, the endogeneity of militancy is of relevance to the debate.

Although unionisation and strike activity are strongly correlated this does not mean that studies using strike-activity measures examine the union effect. Rather, these studies compare the economic performance of firms/industries experiencing militancy against those firms/industries which do not experience militancy. It is true that the firms/industries which experience militancy

are highly likely to be unionised, but it is crucial to see that the firms/industries which do not experience militancy encompass both unionised and non-unionised elements (see Note 5).

With this in mind consider Batstone's argument (see Note 6) :-
'basic failures of production organisation may lead to lower productivity not only directly, but also indirectly through their effects upon union organisation and industrial relations' (1986: 41). This is in effect an argument that both poor productivity and antagonistic industrial relations are jointly created by 'basic failures of production organisation' (which he earlier attributes to lack of management sophistication) and further that antagonistic industrial relations will exacerbate low productivity. Turnbull, discussing the Harvard approach, makes the same point by inviting the reader to 'consider ... the case where inefficient management leads to conflictual labour relations, restrictive work practices and low productivity' (1989:12).

Batstone suggests specific ways in which this process could be manifest :-

'First, stoppages of production due, for example, to shortages of components may lead to a host of industrial relations issues concerning the reallocation of labour and associated problems of pay, seniority etc. Second, where problems of production organisation lead to the need to lay workers off, an economically rational management often has an

incentive to foster strike action... Third, poor organisation and design often mean that production depends upon workers breaking the rules.... This provides a powerful base for fractional bargaining and serves, therefore, to encourage parochial, unsophisticated steward organisation. Fourth, management failures to rectify technical - and related labour - problems mean that strikes may occur over the same issue on numerous occasions (.... see for example Batstone et al., 1978; Beynon, 1973). Problems associated with a lack of management sophistication are likely to be particularly evident in large plants' (1986:41).

Nor are these arguments without other empirical support. For instance, in Lupton's study of Jay's, an electrical components factory, it was found that a large number of delays in production were caused by flaws in the production planning by management (1963:158). These delays, creating instability in earnings, were an important element leading to the workers undertaking 'fiddles' of booked time. Further, there is evidence that lack of management sophistication, labour militancy and poor performance co-existed in important sectors of the UK economy in the 1960s and 1970s. Pratten and Atkinson (1976) summarised results of studies of 'inefficient labour utilisation' in industries in which poor performance was perceived. Of the five sectors in which 'labour restrictive practices' existed all five were subject to 'management failures'. Of the two sectors in which importance was ascribed to strikes, both were subject to

'management failures'.

The purpose of this discussion is not to subscribe to the simplistic argument which ascribes poor performance simply to management inefficiency. As Nichols notes, 'the hypothesis that poor management causes low productivity is essentially unsatisfying' (1986:101). The point is that strong grounds exist for believing that where poor performance and high militancy were correlated in the 1960s and 1970s in many cases both can be said to have been 'created' by poor management. This is not claimed as a complete statement of the relationship between industrial relations and economic performance.

It does, however, have important implications for studies which seek to construct arguments, linking strike activity causally to negative performance outcomes (Metcalf, 1990; Davies and Caves, 1987; Caves, 1980; Wragg and Robertson, 1978). If militancy can be seen as endogenous in the sense described here, then such arguments may be spurious. Further, note that problems of endogeneity will be stronger for industry level data. The four studies referenced immediately above all focus at the industry level.

Performance Measures

The operationalisation of performance outcomes is not an unproblematic process. Also, the particular measures chosen have political implications.

Nolan (1989) has provided an incisive account of two key measures utilised - labour productivity, and total factor productivity. Labour productivity is a measure of output per employee (or employee hour). As Nolan points out, it 'is often presented as a rough and ready index of labour efficiency' (p.102). Total factor productivity is defined as the rate of output growth minus the weighted sum of growth of the inputs, the weights being determined by each input's share of total income. Nolan makes the point that total factor productivity is dependent on a number of highly limiting assumptions. He goes on to argue that a rise in productivity is not synonymous with a rise in productive efficiency, where productive efficiency is defined in technical terms :-

'the concept of production efficiency specifies a relationship between input and output. If output is increased without a corresponding rise in input then it is accurate to speak of an efficiency gain. If, in contrast, the gains in output are secured by increasing input then the situation is not clear-cut. Productivity increases may be consistent with no change, or even a loss of efficiency' (1989:118).

A rise in productivity through an intensification of labour may appear as a rise in efficiency. However, this is only if the measurement of labour is an extensive one. The measures of labour input utilised in the debate are extensive ones.

Another problem with performance measures concerns the conflation of price and quantity effects. Hirsch and Barnett argue that

these studies which posit value-added as the dependent variable 'confound price and quantity effects, that is, part of the measured union productivity differential may in fact result from higher product prices in the unionized sector' (1986:194), i.e. unions, rather than raise productivity simply raise costs which are passed on to the consumer in the form of higher prices. Nolan and Marginson note that this is a common criticism and that 'the best way of overcoming the difficulty is to use a physical measure of productivity' (1988:5). In the USA, Clark (1980a, 1980b) utilised the physical measure of tons of cement per unit of labour time and therefore avoided the problem. In the UK Machin (1987) measured output in value-added terms but deflated this by an appropriate index of industry prices. Within the terms of the debate between the Harvard and neo-classical schools the problem of conflating price and quantity effects is an important one which has only rarely been addressed in substantive research. The importance of the terms of the debate in defining the nature of the problem is discussed later in the chapter.

The final issue concerning measurement of performance outcomes relates to the lack of acknowledgement of the increasing salience of quality and delivery measures as measures of economic performance.

The literature has examined the effect of unions on economic performance by focusing on a number of measure of performance - labour productivity, total factor productivity, productivity growth, profits and investment. These measures do not address

the concept of non-price competition; but there is evidence that non-price competition is becoming increasingly important to capitalist development in advanced countries.

Jones notes that 'objectives such as quality in short runs of components and the completion of final assembly operations to specific times may (perhaps increasingly in the advanced economies) reduce the importance of price considerations' (1985:249). Piore and Sabel relate the salience of price competition to the system of mass production :- 'the victory of mass production meant the redefinition of tastes (through advertising) and merchandising that emphasized price, not quality' (emphasis added) (1984:190). They go on to argue that with the break-up of mass markets and mass production, competition is increasingly related to issues of quality and schedule completion. Similarly, Streeck strongly argues for the increasing salience in the 1970s and 1980s of quality-competition. This is reflected in his characterisation of the emerging form of production as 'diversified quality production' (1991). In considering the export competitiveness of UK manufacturing industry, Williams et al. (1983) note not only the importance of non-price-competitiveness but also the inability of traditional measures of economic performance to address this importance. They argue that the poor UK exports record up to the end of the 1970s cannot be explained by 'out-of-control labour costs', a measure based on traditional productivity and earnings measures. The explanation for the poor performance therefore lies elsewhere than in simple price-competitiveness :-

'Quasi-official NEDO studies.... have argued that the problem is the non-price competitiveness of British manufacturers - inferior design, poor performance, bad marketing, late delivery and inadequate after-sales service' (1983:14).

That none of the performance measures in the debate over unions and economic performance seek to operationalise the concept of non-price-competitiveness must be considered an important gap in the literature.

B. The Limitations of Statistical Studies in Examining Social Processes

'The social scientist's 'factors' or 'variables' are no more than summary measures of what are often highly complex social processes, and it is an in-built deficiency of the method of comparative statistics that it is ill-suited to the analysis of quality rather than quantity and to the exploration of social process' (Nichols, 1986:97).

The argument that statistical studies have significant limitations in the examination of social processes is of particular relevance for the debate on unions and economic performance. It will be recalled that for the Harvard school social process is important in that they recognise production as a social process in which unions and management interact. How

they interact is important to Freeman and Medoff :- 'in what ways does trade unionism raise productivity? How important are lower turnover of the workforce, changes in managerial techniques and the other routes.... These are extremely difficult questions to answer, for they require knowledge not only of differences in the characteristics of organized and unorganized plants but also of the actual ways in which the plants operate' (1984:174).

For the neo-classical school the main (monopoly) route of unions affecting performance is specified a priori; however, when adopting ad-hoc arguments concerning union activities within production their approach similarly implies the need to examine process.

There is a disjuncture between these concerns with social process and the research method of statistical modelling which has underlain the debate. This is acknowledged by Metcalf when he states that 'statistical analyses must be complemented by case studies' (emphasis added) (1988:2).

An important manifestation of the limitations of statistical studies in understanding social processes is provided by Machin and Wadhvani's influential study (1989) which appears to support the Metcalf argument. As noted in the section on the UK evidence, Machin and Wadhvani analysed WIRS data to find that organisational changes 1981-84 were more likely to occur in unionised establishments, but only if there had been an intensification of competition in the product market. This is

interpreted by the authors as evidence concerning the removal of 'restrictive practices'. In particular, it is asserted that 'establishments with recognized unions are more likely to have restrictive work practices compared with non-union establishments - so although non-union establishments are not exempt from the existence of restrictive practice, the commonplace image of unions securing reductions in effort appears to be confirmed' (Wadhvani, 1990:376). This draws a conclusion concerning social processes from a statistical model. How far is the interpretation legitimate?

Firstly, it is necessary to clarify the measures being used. There are two relevant questions from the 1984 WIRS questionnaire which the authors use. The first question focused on 'organisational change', on whether 'substantial changes in work organisation or work practices not involving new plant, machinery or equipment' had occurred in the establishment in the previous three years. The second question (asked of a smaller sub-sample) concerned whether or not management felt constrained in their organisation of work.

To examine how the authors move from the questions concerning organisational change and managerial perceptions of constraints to conclusions concerning 'restrictive practices' it is necessary to probe the concept of 'restrictive practices'. The concept is a contested one. The authors appear to be following an approach similar to that adopted by Ulman (1968) in which restrictive practices concern the practices of labour which inhibit the

efficient utilisation of labour. This approach is most explicit when Machin and Wadhvani define 'limits', i.e. constraints, as being where $E < E_{max}$, where E is effort, and E_{max} is 'some upper bound level of effort which management chooses' (1989:5). There is therefore a hypothetical maximum against which to measure actual effort.

There are a number of problems here. Firstly, effort is a difficult concept to measure (see Baldamus, 1961:29-30); Edwards and Whitston, 1991). Secondly, the concept of 'restrictive practices' should not be seen as a neutral measure; rather it is politically defined. The concept as used by Machin and Wadhvani involves the definition of the upper level of effort as held by management. As Lupton argues, this makes it a definition with strong political assumptions :- 'to speak of restrictions of output in such circumstances is merely to express an opinion that workers ought to do more' (1963:182). Beyond this, even accepting a managerial definition of restrictive practices there remain real problems in interpreting the WIRS data in terms of restrictive practices.

The argument that management itself had an upper band level of effort which it had chosen contradicts much of the knowledge available of British manufacturing management in the 1960s and 1970s. Lupton's comments on the concept of 'restrictions of output' are relevant :-

'I was not able to ascertain accurately whether the 'fiddle' did, in fact, result in restriction of

output. This was because management made no estimate of the daily or weekly output of the shop against which I could measure actual output. So there was no hypothetical maximum against which to measure actual production' (emphasis added) (1963:181-182).

Other case study examinations of UK manufacturing in the 1960s and 1970s suggest that this picture would not have been untypical of large sectors of the manufacturing economy. For instance, it is apparent that in the plant studied by Belanger and Evans (1988), management had no hypothetical upper level of effort in mind. Whilst extensive shopfloor job controls existed such that workers were able to 'get the day in' and then take 1-3 hours of leisure, it is apparent that these job controls could not be defined as restrictions on output or restrictive practices where these terms are managerially defined. A managerial preference for an upper band level of effort would be predicated either upon an active marketing strategy which would seek to increase the market share of the firm's products, or upon an active cost-reduction strategy. The former strategy would have necessitated higher output, but the management in the plant did not work under such a long-term strategy, their policies were 'reactive' and 'incoherent'. In the short term, and they were primarily concerned with the short term, management were satisfied with the levels of effort and output (see Note 7). With this connection between the form of shopfloor relations and a reactive marketing strategy it is relevant to note Williams et al's (1983) characterisation of British management as being particularly

deficient in marketing. Their argument is backed by strong evidence.

Furthermore, Machin and Wadhvani implicitly argue that the origins of 'restrictive practices' lie solely in actions of collective labour - the practices are imposed by labour and their removal is sought by management. This is an inadequate understanding of the social origins and meanings of these practices; it lies in contradiction to the research findings of industrial sociologists. Edwards and Terry note that 'the contradictory nature of job controls is now well-established. Not only are they ways for workers to challenge managerial authority, but also they are often modes of accommodation with that authority, and they can actively assist the production process' (1988:216). For instance, Friedman describes the gang system at Standard Motors in which labour had a wide area of autonomy on the shopfloor :- 'the gang system represented a solution to top managers' need for an extremely flexible and 'responsible' labour force.... The gang system also increased workers' direct control over productive activity' (1977:213).

It is not useful to describe such practices as restrictive practices, they are part of a particular social organisation of production, an outcome of labour-management interaction, not simply of an imposition by labour. This was a form of social organisation of production which matched the form of product market to the extent that profitability in the short-term was secured, and it was primarily the short-term with which

management were concerned.

Lewchuk (1986) makes precisely these points in his analysis of the motor vehicle industry. He states that whilst productivity was low in the industry, it was not until the 1970s that profit levels were not high. He stresses that the job controls that existed should not be seen as a form of labour imposition of restrictive practices, and the job controls have to be understood in relation to the low levels of management production skill :-

'Faced with an organised workplace and managers who were unable to co-ordinate factory production, Martin attempted to create a factory system in which the workforce, paid by the piece, would itself fulfil a number of managerial tasks such as parts delivery, machine maintenance, and quality control' (1986:140).

Job controls existed as part of a social organisation of production which allowed profitability to be maintained in the short-term with the given product market conditions.

As the nature of product markets began to change substantially in the 1960s and 1970s (e.g. see Williams et al.(1983:7-8) for the dramatic rise in import penetration ratio for products of manufacturing industry in the UK) a disjuncture began to appear between this social organisation of production and even short-term profitability, prompting management into attempts at reform which culminated in the 'organisational change' identified in the WIRS data. Piece-meal and ill-conceived attempts at reform in the 1960s and 1970s encountered resistance, with unions acting

as institutions which rigidified the social organisation of production. Lewchuk notes for the car industry that 'there is evidence to suggest that the difficulties associated with the British move towards Fordism and direct control after 1950 had as much to do with the lack of professionalism within management, as it did with the resistance by the trade unions' (1986:151).

This is a significantly different scenario from the simplistic one painted by Machin and Wadhvani in which management is at last allowed to remove labour-imposed restrictive practices due to the drop in union power arising from either product market changes or the union legislation of the 1980s. Aside from the importance of this substantive argument this discussion has highlighted the limitations of statistical modelling in understanding social processes.

C. Theoretical Problems with the Production Function Approach

Two assumptions underlying the production function approach are problematic. Firstly, the approach assumes that the switch to capital by management in response to higher union wages has a net negative effect on allocative economic efficiency and the substitution of capital for labour is controlled for within the terms of the model. However, within another school of thought such a substitution, rather than having to be controlled for, lies at the heart of the impact of unions on economic performance. Central to Marx's analysis of capitalism was that

economic development was driven forward not only by the forces of inter-capitalist competition but also by class struggle between labour and capital. He wrote (1977:562-3) that '[machinery] is the most powerful weapon for suppressing strikes, those periodic revolts of the working-class against the autocracy of capital.... It would be possible to write quite a history of the innovations made since the 1830s for the sole purpose of supplying capital with weapons against working class revolt'. The concept of the introduction of new technology for control purposes is an alien one to the neo-classical approach which is blind to the power relationship in employment. The Harvard school acknowledged the issue of power in employment but failed to integrate this concept within the core of their analysis. The control aspect is only part of Marx's argument; he accepted that technology could be introduced because labour had become too expensive.

Whilst Marx's concept of capitalism being driven forward by both competition and class struggle has strengths, Marx's own writings concerning the nature of class struggle in this context are not without problems. Marx assumed that the capitalist's control of technology would make for the complete subordination of labour within the labour process. Nowhere in his account of the move from the formal to real subordination of labour is there a part for the self-activity of workers in resisting and adapting technological change; the subordination of labour is seen as the inevitable outcome of the processes of technological development.

Hobsbawm's (1968) account of unionisation in the nineteenth century gasworks industry puts empirical flesh on to this theoretical point. Hobsbawm shows that in the 1870s and 1880s the gas industry was stagnating; technological change was slow and there was a tendency for productivity per worker to fall. There were a number of technical innovations available in the 1870s, but given the cheapness of labour they were not implemented in the industry. Unionisation occurred in 1889 and union demands were met. This both substantially increased the wage bill and reduced the intensity of work. The effect of unionisation was such that management immediately embarked upon a programme of technological change, a major desire being to 'eliminate skilled labour' (p.167) implying both cost and control objectives. Whilst the new technology had the effect of greatly increasing productivity it did not succeed in eliminating the bargaining power of the workers, 'despite counter-attacks from management' (p.169). Hobsbawm argues that the union's strength was not undermined because they were able 'to maintain their relative indispensability during the crucial transition period.... [and] 'capture' the new devices for recognised unionism' (p.170).

A second wider problem with the mainstream debate is that it cannot examine the relationship between the sphere of exchange and sphere of production. Implicit in the production function approach is the assumption that the product market of the firm is given and determining. Streeck (1991) argues that 'in the world of standard economics, product markets are seen as

DETERMINING.... the choice of product ranges. These, in turn, determine product technology, which then determines work organisation, which determines skill requirements, from which, finally, flow wage levels and wage structures' (p.74). However, there is a growing and important literature on the pro-active role that firms can have in creating and/or choosing markets. The implications of this is that firms increasingly face the choice of continuing to produce in the mass, low quality, price-competitive markets or moving into niche, quality-competitive markets.

One implication of the firm having a choice is that unions may be able to influence the choice, either in terms of pushing the firm up-market or serving to consolidate constraints of low trust relations which militate in favour of remaining in the mass market. For instance, Streeck (1986) argues that the constraints on management action set by unions and works councils in Germany are such that they push firms in the motor industry into locating their high value-added, high quality production in that country.

Advocates of the production function approach acknowledge the legitimacy of criticisms concerning the conflation of price and quantity effect through output being measured in terms of price of sales. The Harvard and neo-classical analysis have common praise for those studies which are able to have output measured in terms of quantity instead of price. However, the shared criticism concerning the conflation of price and quantity misses the point that a key mediation in the relationship between unions

and economic performance is the potential role of unions in pushing firms 'up-market'. This is especially so since the 1970s and the increasing fragmentation of markets. Because both the Harvard and neo-classical schools have models in which the sphere of exchange is given they are unable to investigate the relationship between the spheres of exchange and production and its implications for economic performance :-

'differences in commercial success depend not only on the different degree to which managements are permitted to implement their.... strategies, but also, and probably at least as much on differences in strategies themselves' (1986:9).

Industrial relations can have a role not just in constraining the implementation of management strategy but also in influencing the type of strategy itself.

Nolan (1992) argues that the concept of the union shock effect has close affinities with Streeck's analysis of 'the dynamic consequences of institutional 'rigidities', including union organisations, in (West) Germany' (p.9). Is Nolan's argument valid? It must be noted that the concept of a shock effect has not been well articulated. The term 'shock effect' has been primarily used to denote a dynamic whereby a form of worker action, be it unionisation (Clark, 1980b), the prevention of labour intensification (Nolan and Marginson, 1988), or, potentially, a form of militancy, leads to a form of reaction by management, be it either 'the adoption of best practices' (Nolan and Marginson, 1988), or 'extensive changes in management

personnel and procedures' (Clark, 1980b). The reaction by management then impacts positively on economic performance.

There is an important difference between this shock effect argument and Streeck's approach. Whilst Streeck's approach hinges on the interconnections between production and exchange, the concept of a shock effect is apparently centred on issues of (in)efficiency within production. Indeed, it is not clear how far the concept of the shock effect differs from issues central to Leibenstein's concept of 'X-efficiency', a concept whose sole focus is upon the sphere of production. This point is recognised by Addison who notes that 'since the.... [Harvard] argument links improvement in productivity in part to shock effects, there is also an allusion to notions of X-inefficiency (Leibenstein)' (1985:130).

Consider Metcalf's approach against the insights drawn from Streeck. The Metcalf argument is centrally focused on unions constraining the effectiveness of management strategy in the 1960s and 1970s, and fails to consider the possibility of unions affecting the form of strategy itself. The argument regarding unions constraining the effectiveness of management strategy has already been discussed above where it was argued that 'restrictive practices' was an inappropriate conceptualisation of the social organisation of production in the 1960s and 1970s. But what of the effect of unions on the form of the strategy itself?

Firstly, the obvious point is that firms were not pushed 'up-market'. Nolan (1989:112) argues that by the 1960s the UK was becoming a centre for relatively cheap, disposable labour, and that the following decades saw the consolidation of the UK economy as one based on low value-added production. Secondly, it is debatable how appropriate it is to apply the term 'strategy' to the practices of UK management in this period, given that the term implies a degree of medium to long term planning, and given that UK management was primarily reactive, acting on short-term horizons, and low in production skills. The question arises - did unions act in any way to reinforce this approach?

They did in the sense that the nature of job controls reflected and reinforced the lack of management production skills. This is another way of looking at the dual nature of job controls. Given their own lack of production and planning skills, managements were grateful to abrogate areas of responsibility for the organisation of production. The increased strike rates in the 1960s and 1970s in part reflected labour's increasing unwillingness to bear the costs of the inefficiency deriving from the lack of managerial production skills, but this was not sufficient to prompt anything more than piecemeal attempts at reform of the social organisation of production.

The discussions of constraints and of the nature of strategy, taken together, provide a coherent explanation of the poor

performance of the UK manufacturing economy in the 1960s and 1970s which matches the available evidence on performance and the nature of industrial relations more satisfactorily than does the Metcalf argument. In these terms, any short-term union 'constraints' on the effectiveness of managerial 'strategy' were far less relevant to understanding the poor performance of UK manufacturing than the fact that shopfloor relations did not push management into altering the nature of its short-term approach, but rather served to consolidate it. This is an argument which goes beyond the terms of the debate defined through the use of the production function approach.

2.5. Conclusion

This review of the literature has made both methodological and substantive points in criticising the Metcalf argument that the existence of powerful unions in the 1960s and 1970s underlay the poor performance of the UK manufacturing economy in the those decades, and in putting forward the counter-argument concerning the nature of the social organisation of production in the period. Indeed, the methodological and substantive points informed each other, particularly on the points that the examination of management must be central to the analysis and that there are limitations in the examination of social processes by statistical studies.

A feature of the debate which has also been stressed is that

there exists only fragmentary evidence. More research is required. This thesis seeks to provide further research. Recognising the limitations of statistical models in examining social process, the research is based upon a case study approach. Further, recognising the compelling arguments for a focus on the social nature of production, the thesis places the nature of union-management interaction at the centre of its focus.

The question then arises as to how this relationship is most usefully examined in a case study. The classic condition to look for in examining a relationship between two variables is variation in both variables. In this instance, therefore, it is useful to look for a situation where there is variation in both economic performance and industrial relations. Moreover, the force of seeking variation in the variables matches the need for a dynamic focus to the study. Further, a case will be preferred which allows scope for generalisation both in theoretical terms and in terms of substantive empirical findings. The following chapter will elucidate how these concerns guided the choice of the engineering construction industry as an appropriate case to study.

Finally, there is another level at which the question of how best to examine the relationship must be addressed. Should the study simply concentrate on the changes in industrial relations and attempt to work through these effects upon performance, or should the study address the wider question of what caused the change in performance, and examine the role of industrial relations

within this? The latter is more appropriate for two reasons. Firstly, the former approach, by an exclusive focus on industrial relations may overstate the importance of the effect of industrial relations. Secondly, the former approach will fail to address the relationship between industrial relations and capital relations. Potentially, such a relationship could be an important mediating link between industrial relations and economic performance.

Notes

1. This quotation assumes that union density is the measure used to operationalise collective labour organisation. Other measures - union recognition, collective agreement coverage, frequency of strikes, days lost to strikes, workers involved in strikes, and 'bellicosity' - have been used, however.

2. Metcalf himself states that 'I surmise that industry data are inferior to work-place or firm data to establish the connections' (1990:251). The studies examined are based on workplace/firm level data.

3. Metcalf's argument has intellectual antecedents in the neo-classical school. He directs attention not just to unions but to the origins of union power. Freeman and Medoff note a similar line of argument in the neo-classical tradition :-

'The fact that union monopoly power is likely to be important only when unionised firms either completely dominate a market or operate in a non-competitive market has created an interesting intellectual anomaly. Some economists of a strong free-enterprise bent, who one might expect to be strongly opposed to unions, are in fact rather indifferent. They believe that markets are competitive enough to give unions little or no power to extract monopoly wage gains' (1984:7).

Metcalf differs from this precise line of thought in that he implicitly sees the origins of union power as lying in other spheres beside that of the product market. However, he is never explicit on the origins and nature of such power. Inherent problems in the approach are highlighted by Nolan and Marginson :-

'Power structures and forces are totally alien to the neoclassical analysis of production, yet they occupy a central position in Metcalf's assessment of recent

changes in British economic performance.... On the one hand.... Metcalf falls back on a corpus of economic theory which denies the existence of power structures. On the other hand, he brings forward empirical arguments which emphasize their salience' (1988:7).

4. A clear causal argument is present when Metcalf states that 'it is now possible to tell an entirely consistent story - based on hard facts - about what unions do' (1988:1).

5. Knight (1987), for instance, makes the error of claiming that his study of the association between strike activity and productivity levels examines the union effect :- 'these results from the majority of industries actually confirm the 'alternative' face of unionism favoured by Freeman and Medoff' (p.369) (emphasis added). Similarly, Metcalf (1990:251) reproduces this error by stating that 'different dimensions of strike activity had different effects.... This again shows that 'unionization' does not have a unique effect' (emphasis added).

6. Whilst Metcalf makes extensive reference to this Batstone article he fails to address the arguments examined here.

7. Note that the plant described by Belanger and Evans constitutes, *prima facie*, an archetypal example of a firm subject to very strong restrictive practices.

CHAPTER THREEA CASE STUDY - THE ENGINEERING CONSTRUCTION INDUSTRY, AND RESEARCH METHODS3.1. Introduction

The previous chapter argued that in order to examine issues of process and causation in the relationship between industrial relations and economic performance it is useful to undertake case study research. This chapter seeks to argue that the engineering construction industry (ECI) is an appropriate industry in which to base such a case study. It then outlines relevant characteristics of the ECI. The final section of the chapter details the research methods of the study.

3.2. A Case Study - Why the ECI?Variability

The previous chapter argued that, following the classical conditions of looking for variation in relevant variables, a case study should seek to examine an arena where both industrial relations and economic performance vary. The ECI from 1960 to 1990 fulfils these conditions. The 1988 NEDO/NJC report, The Project Record, argued that the industry in the 1960s and 1970s

was subject to considerable delays against construction schedule, whilst in the 1980s project performance was substantially improved. The report characterised the industrial relations of the 1960s and 1970s as dominated by site-level labour militancy, particularly manifest in leapfrogging wage bargaining. In 1981 a comprehensive national agreement was introduced which, the report argues, had the effect of centralising negotiations and creating order and stability on sites.

Clearly it can be pointed out that a number of industries could have been chosen which exhibited variation in both relevant variables in a similar time period, so there is a need to look for further reasons why the ECI was deemed a suitable industry to study. A number of supplementary reasons can be put forward.

A Crucial Case for the British Worker Question

Firstly, it can be seen as a crucial case study of the thesis that labour militancy lay at the root of the poor performance of the UK economy in the 1960s and 1970s. The term 'crucial case' study here follows Mitchell's (1983) discussion of the differing uses of case study research. He describes the crucial case studies as offering

'the circumstances which enable the analyst to reject some theoretical proposition.... the selection of the case is clearly difficult : the assumption is that enough will be known about the phenomenon a priori to

enable the analyst to recognise the particular significance for the way in which the proposition has been formulated. A detailed study of the case will then enable the analyst to relate events to the theoretical proposition.' (p.197).

The thesis that labour militancy lay at the root of the poor performance of UK industry in the 1960s and 1970s gained common currency in the 1980s within discourse in the mass media, within academic work, and within the political arena. Perhaps the clearest political statement of this thesis came in a pamphlet written by leading Conservative M.P., Keith Joseph in 1979 entitled, Solving The Union Problem Is The Key to Britain's Recovery.

Nichols (1986) characterised this thesis as that of 'the British worker question'. In his examination of the comparative international research which apparently supported this perception, Nichols convincingly showed that the methods of the research were deficient primarily in terms of inadequately controlling for other relevant variables and in terms of relying too heavily upon managerial perceptions, information and definitions - a reliance which is likely to lead to problems of bias.

Nichols' work is important in subjecting the comparative academic research to suitable tests of rigour. What the book does not do, nor claim to do, is to disprove the British worker thesis. His

work merely shows that the case remains unproven; he has not dismissed the thesis. Arguably, it is still a common perception within the discourse of the mass media, and, moreover, it has been resurrected, albeit in a more subtle and refined manner, in recent academic work. As argued in chapter 2, Metcalf has argued that changes in industrial relations in the 1980s were the key elements in the apparent substantial improvement in the labour productivity record of UK manufacturing in the decade (1989). The corollary of this is that the unreformed labour relations problems of the 1960s and 1970s lay at the root of the poor performance in labour productivity in the 1960s and 1970s. As such, the British worker question thesis continues within the academic discourse.

The ECI can be seen as a crucial case for the British worker thesis because of the high level of labour militancy in the industry, and the ostensible link of this militancy with poor performance against construction schedule. The 1970 NEDO report into the industry quoted the Department of Employment and Productivity's conclusion from three ad-hoc surveys of large construction sites in the 1960s :-

'while we lack a precise measure of days lost per thousand workers, it appears that in this period large industrial construction sites were one of the most strike-prone sectors of the economy, exceeded only perhaps by the docks and the motor industry, and the situation has deteriorated even over this short period' (NEDO, 1970:104).

'This strike record, though indicating a worrying loss of production, tells only part of the story. It does not show the extent of 'go-slows', refusals to work overtime, or the debilitating hostilities between management and men' (1970:42).

That the National Economic Development Council believed that there was a clear causal link between labour militancy and poor performance is made clear from the terms of reference given to the working party which produced the 1970 report :-

'to inquire into the problems of organisation of large industrial construction sites with particular reference to labour relations, to investigate the causes and effects on cost of commissioning and operating plants, and to make recommendations' (1970:7) (emphasis added).

Governments of the 1970s continued to be concerned with the high level of labour militancy in the industry, and the impact of this on performance. In November 1970 the Commission on Industrial Relations was asked to investigate industrial relations at the Alcan smelter site, Northumberland. The report describes the background to this request as follows :-

'the completion of the Alcan construction site at Lynemouth is, at the time of publication, at least a year behind schedule and a significant part of this delay is the result of industrial unrest.... It was with these points in mind and the fact that there were a number of serious labour problems on site, and

following discussions between Alcan and the Department of Employment, that the reference was made to the Commission on Industrial Relations' (1972:1).

A decade later, the 1981 Report of the House of Commons Select Committee on Energy stated that 'during May, 1980 an industrial dispute involving the Thermal Insulation Engineers.... at the Isle of Grain was drawn to the attention of the Committee' (1981:44), and the Committee, therefore, included a consideration of the dispute within their wider report which concerned the general economic performance of the CEGB.

The dispute at the Isle of Grain gained widespread media coverage, and there were other instances of media coverage of the industry in the 1970s. The prevalent thesis of this coverage was that militancy was widespread and that this led to poor performance against construction schedule. The Sunday Times began a major feature article on the Isle of Grain power station as follows :-

'[four years ago] Europe's biggest and most advanced power station was already two years behind schedule. Matters have since got steadily worse. Strikes and inter-union squabbles have increased and work is now four years behind schedule' (January 27, 1980).

The clear implication here is that militancy directly led to the delays. An earlier article in the same paper concerning the same project had a similar slant :-

'the bonus rows have been exacerbated by the failure of the workers to achieve even modest productivity

targets' (October 1, 1978) (emphasis added).

The paper assumes that low productivity is primarily due to the recalcitrant labour force.

From the above it can be seen that the ECI in the 1960s and 1970s constituted an archetype for the argument that labour militancy lay at the root of poor economic performance. This thesis represents a crucial case study in that if this argument cannot be substantiated for the ECI in the 1960s and 1970s then its more general validity must be put into serious doubt.

The ECI as a Prototype for Capital Relations and Organisation of Production

The aim of the case study is to examine why economic performance changed from the 1960s/1970s to the 1980s. This entails not only studying labour relations but also capital structure and relations in the industry. There is a strong, though more speculative, argument that the organisation of production within the ECI can be seen as prototypical for the organisation of production within wider sectors of the UK economy.

At first sight it would appear that the organisation of production in the ECI is atypical. The most common form of production occurs within a stable physical area, often a factory. Production is permanently located. In the ECI production is permanently dislocated, firms come onto site to undertake certain

agreed construction and some months or years later they relocate to another site. Not only is the ECI apparently unusual for the physical dislocation of production but also because of its capital structure. In the ECI different sequences of the construction of a plant, the levelling of the ground, the laying of the foundations, the erection of steel frames, the laying of the pipework, the instalment of the mechanical machinery, the laying of the electrical cables, and the insulation of the plant, will be undertaken by different firms or contractors.

Streeck (1991), however, has suggested in passing that the organisation of production in construction can in an important sense be seen as prototypical. Streeck, discussing the institutional conditions necessary for diversified quality production, a form of production seen as succeeding Fordist mass production, states that,

'high product diversity and quality sometimes seem to go together with an attenuation of the distinction between firms and their competitors, as well as a blurring of the boundaries between firms and their suppliers.... To the extent that diversified quality production is enhanced by a fluid, quasi-consortial pattern of industrial organisation - with joint ventures being set up like building sites, for special projects, to be dismantled after their completion - firms in a given industry are at the same time competitors and potential allies' (p.34) (emphasis added).

The relevant point here is that Streeck suggests that production will be increasingly characterised by its lack of permanence, by its dislocation, by the flexibility of firms in redefining and reconstituting themselves, and that a prototype for such flexibility and reconstitution is the contracting firm in construction. He is suggesting that in the same way as contracting firms come together on construction projects, so increasingly manufacturers' production will be organised on a quasi-project basis with firms coming together, albeit not necessarily in a physical sense.

Whilst the term 'diversified quality production' is peculiar to the writing of Streeck, its conceptual basis has important commonalities with Piore and Sabel's concept of 'flexible specialisation', and with Kern and Schuman's (1987) concept of 'new production concepts'. All stress the increasing importance of uncertainty and flexibility in shaping the nature of the organisation of production, and that increasingly successful production systems will be based on cooperative relations between firms as much as on competitive relations.

Indeed, Stinchcombe and Heimer (1985), writing prior to (or at least without reference to) the emerging conceptualisations of the new form of production, argued that a high degree of uncertainty in terms of design inputs and production outcomes was a characteristic of a number of major sectors of the economy.

Sabel eloquently puts the case that this uncertainty and flexibility is becoming more pervasive :-

'as markets become more volatile and fragmented, technological change more rapid, and product life cycles correspondingly shorter, it is too costly and time-consuming to perfect the design of new products and translate those designs into simply executed steps. Those formerly charged with the execution of plans - technicians, blue collar workers, outside suppliers - must now elaborate indicative instructions, transferring the final design in the very act of executing it' (1992:215).

Streeck argues that the changing nature of product markets is such that purely competitive relations between larger and larger firms are no longer congruent with the demands being placed upon production :-

'under a competitive market logic, the prosperity of one firm is based on the elimination of other, competing firms; under a hierarchical organisation logic, it entails the inclusion of different levels of the production chain in one corporation and their subjection to centralised managerial control. Neither of these seem fully functional for diversified quality production where shorter (sub-) batches enveloped in long (sets of) batches, as well as higher quality standards, appear to put a premium on strategic alliances and joint ventures between firms at the same level of the product chain, and on close, privileged and trust-based cooperation between assemblers and

suppliers at different levels' (1991:33-34).

In so far as the construction site can be seen as a prototype for the future organisation of production and in so far as the nature of capital relations can be seen as a key determinant of economic performance then the choice of the ECI as the site for a case study can be seen as particularly appropriate. Central to the study is an examination of the nature of capital relations in the ECI. If these relations are found to be of a low-trust, conflictual nature, or of a high-trust, cooperative nature then the precise nature of the implications for economic performance can be spelled out. This greater understanding of the nature of the relationship between capital relations and economic performance will have resonance for the manufacturing economy given the argument concerning the construction site as a prototype.

A Crucial Case for Williamson's Framework

An important consequence of choosing the ECI as a case study is that it constitutes a crucial case for the Williamson transaction costs framework. Williamson is a leading proponent of the institutional economics revision of the neo-classical approach. The point of departure from the neo-classical approach is that transaction costs 'regards the business firm as a governance structure rather than a production function' (Williamson, 1985:18). Williamson, however, does not depart from the rational economic individual as the basis for his social theory. Indeed,

his concept of opportunism as a fundamental trait of human behaviour in a sense strengthens this assumption :- 'opportunism is an effort to realise individual gains through a lack of candour or honesty in transactions. It is a somewhat deeper variety of self-interest seeking assumption than is ordinarily employed in economics; opportunism is self-interest seeking with guile' (Williamson, Wachter and Harris, 1975: 258). He also modifies the assumption of perfect information with the concept of 'bounded rationality', the essence of which is that there are computational limits to human capabilities in processing information. One effect of this is to provide enhanced scope for opportunistic behaviour in comparison with that existing under the neo-classical assumption of global rationality.

The central tenet of the Williamson approach is that the coordination of economic activity through administrative units (firms) rather than markets can be explained in terms of the costs incurred in transacting in markets. If institutions reduce transaction costs below those arising in the market then they are considered to be efficient. Economic organisation can be understood as a process in which actors economise 'on bounded rationality while simultaneously safeguarding transactions against the hazards of opportunism' (Williamson, 1985: xiii). This means that with the operation of the competitive process more efficient modes of contracting emerge over time. Francis et al. characterise Williamson's (with Ouchi) approach thus : - 'they believe that in the long run, say ten years or so, competition both in the factor and product markets will ensure

that efficiency considerations dominate' (1983: 7). Only longer-term 'buffers' against competition can prevent this :- 'natural selection forces do not always operate quickly.... Firms that are buffered against product market rivalry... can postpone the reckoning' (Williamson, 1985: 129-130).

Williamson has argued that 'the full range of organisational innovations that mark the development of the economic institutions of capitalism over the past 150 years warrant reassessment in transaction cost terms' (1985:17). His analysis of the changing nature of economic organisation in capitalism has covered a wide time period, with particular stress on understanding the levels of vertical integration amongst USA firms. In the analysis, vertical integration is to be understood as economising on transaction costs rather than forming a monopoly. He is not, however, solely concerned with issues of vertical integration, and the approach is not dependent on simplistic models of discrete transactions contrasted with vertical integration :- 'suppose that transactions were to be arrayed in terms of the degree to which parties to the trade maintained autonomy. Discrete transactions would thus be located at the one extreme, highly centralized, hierarchical transactions would be at the other, and hybrid transactions (franchising, joint ventures, other forms of nonstandard contracting) would be located in between.... I am now persuaded that transactions in the middle range are much more common' (1985:83).

The ECI constitutes an ideal case where the transaction costs

approach should be able to explain the form of economic organisation. Williamson has stated that 'any issue that either arises as or can be recast as a problem of contracting is usefully examined in transaction cost terms' (1985:xii). The economic organisation in the ECI is very plainly a 'problem of contracting'. It is also argued that the transaction costs approach will particularly aid understanding where a condition of large numbers competition obtains at the outset but where a condition of bilateral treaty evolves thereafter. This process, termed 'the fundamental transformation' (Williamson, 1985:12), has clear parallels with the tender process, within the ECI, evolving into the execution of a contract by one contractor for one client.

If the Williamson framework is unable to aid understanding of the economic institutions of the ECI, 1960-90, then the more general validity of the approach must be put into serious doubt.

The ECI - Unstudied but Important to the UK Economy

Another important, though subsidiary, reason to choose the ECI as a site for a case study is that its social relations remain largely unstudied by the academic community despite the fact that the industry's effective performance is a necessary condition for the development of the manufacturing sector in the UK.

The academic literature concerning the ECI's social relations and

economic performance is sparse. Eldridge (1968) devoted a chapter to a discussion of a dispute in the ECI in 1954-55 within his book which examines the sociology of industrial disputes. The study primarily concerned itself with the role of the national institutions in the dispute. Lumley (1980) published an article which examined the influence of security of employment on industrial disputes for which the fieldwork was undertaken on a petro-chemical construction site between 1972 and 1974. Paling (1982) submitted a Ph.D. thesis to Brunel University entitled, 'Industrial Relations in the Building, Civil Engineering and Engineering Construction Industry'. The main question which Paling addressed was the extent to which legal provisions affected industrial relations, and his main research method was a series of questionnaire surveys to contracting firms. Both Lumley and Paling contributed little either to the more general questions which they addressed or to an understanding of the social relations of the ECI.

Morris and Hough (1987) have written on the management of major projects and in doing so have included a discussion of the construction of Heysham 2 power station. This discussion suffers from an acceptance of managerial perceptions and definitions and is characterised by a descriptive rather than analytical approach. Most recently, Garfit (1989) has described the process of negotiating the 1981 national agreement. Again, his is a primarily descriptive account, in which the role of the Oil and Chemical Plant Constructors' Association (OCPCA) is given particular emphasis. This emphasis is understandable given that

Garfit was the Director of the OCPCA during the negotiations.

There is also a small, more explicitly managerialist-prescriptive literature on the ECI. Carr and Williamson (1982), Kharbanda and Stallworthy (1983), Stallworthy and Kharbanda (1985) and the 1983 report by the Construction Industry Research and Information Association all include discussions of particular projects within the ECI.

The bulk of the extant literature on the ECI is made up of research undertaken by public bodies. As argued above, the ECI was perceived by governments throughout the 1970s as the archetypal case in which labour militancy underlay poor economic performance. Reflecting this, a number of studies were undertaken by public bodies. These were the 1969 Wilson Report, a number of NEDO studies (1970, 1976, 1986, 1988 (with NJC), and 1990), the 1972 Commission on Industrial Relations report, the 1981 report of the House of Commons Select Committee on Energy, and the 1981 report by the Monopolies and Mergers Commission. A number of these studies provide important information concerning the social relations of the industry, but all can be criticised for their lack of critical insight and their acceptance of managerial perceptions and definitions. The precise arguments and failings of a number of these studies are examined within the substantive sections of this thesis, in particular in chapters 5 and 6.

Despite its small size in terms of employment, the ECI plays a

pivotal role in the UK economy - as Lumley states, 'large industrial construction sites have an economic importance disproportionate to the manpower they employ' (1980:68). Garfit (1989:1) notes 'the total installed costs of plant built in Britain in 1986 was around £6 billion, but the numbers actually engaged in on-site erection work were only around 25,000'. The ECI involves the construction of electricity generating plants, oil and chemical process plants, and manufacturing plants. As such, important sectors of the UK economy rely upon the effective performance of the ECI. A corporation's decision to site a plant in the UK will be determined not only by running costs and efficiency, by its geographical location relative to product and supply markets, but also by the length, cost and degree of uncertainty associated with the construction of the plant itself. The importance of the economics of the construction process itself to investment decisions was manifest in the 1980s debates concerning the possible construction of Sizewell B nuclear power station. At the public enquiry into the issue a central line adopted by those opposed to the construction of the plant was that the projected length and cost of construction would in all likelihood be overrun, and that therefore the economic case for the station was seriously undermined. Further, the 1970 NEDO report quoted a report on investment by the Chemical Industries' Association which concluded that 'average building time for new plants erected in North West Europe has been shorter than for similar plants in the UK. More important, however, is the great variation that has taken place in the UK. This has made completion dates difficult to predict with confidence. The bad

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cases have presented a generally unfavourable prospect to international observers' (p.12).

The importance of the ECI to the UK manufacturing economy demands that its social relations and the determinants of its economic performance be understood, but the academic literature on these very issues is weak. This study serves to correct this situation.

3.3. Features of the Engineering Construction Industry

Definition

Garfit gives the following definition :-

'[the ECI] is the generic title given to the total process of designing, ordering materials for and constructing manufacturing plants such as power stations, oil refineries, and chemical works' (1989:1).

The ECI effectively constitutes a third sector of the construction industry - along with building and civil engineering. At the margin it is perhaps difficult to differentiate the ECI from civil engineering, 'but there is a clear difference between infrastructure work which is civil engineering and the building of manufacturing plants, which is engineering construction' (Garfit, 1989:1).

Whilst some institutions associated with the industry were in existence between the wars (e.g. in 1924 the Constructional Engineering Union separated from the Iron and Steel Trades Confederation), the major expansion of the industry came in the post-war period when the size and complexity of power and process plants grew considerably - Garfit notes 'the large petrochemical construction sites which were being developed in the post-war period' (1989:2), and the 1970 NEDO report states that 'projects undertaken in the 1960s and the late 1950s are larger than ever before. In a period of fifteen years power stations have increased ten-fold in size' (p.9).

Between 1978 and 1988 it is estimated that the numbers employed on ECI sites ranged from 12,753 (in 1987) to 22,181 (in 1978) (Clifford, 1990:27).

Structure of the ECI

The structure of the capital of the industry can be examined by considering three levels of actors - clients, contractors, and managing contractors. Clients are the large firms or state bodies which request and pay for particular plants to be built. They are the owners and the operators of the plant once it is built. They employ contractors to undertake the construction of the plant. Contractors are often hired through the tender system in which the client invites bids to undertake a specified piece of work. Sometimes the clients will hire managing contractors

to oversee and manage the construction of the plants. On a project with a managing contractor the contractor has a direct contractual relationship with the managing contractor and not with the client. The differing forms of managing contractor, and of contract are specified in the glossary of contractual terms.

There are a number of identifiable stages to the construction of a plant. The 1982 NEDO booklet, Guidelines for the Management of Major Projects in the Process Industries identifies design, civil and structural, equipment, piping, instruments, electrical lagging/painting, start-up. The specialisms of contracting firms broadly follow these contours, e.g. specialist contracting firms seek solely to undertake the lagging of a plant, although some contractors offer to undertake work covering a number of stages of construction.

The manual labour on ECI sites can be divided into a number of occupational groups. Clifford of the Engineering Industry Training Board identifies nine such groups. Table 3.1. lists those occupational groups and gives the percentage of the group within the total employees on ECI sites in 1989.

Table 3.1. Employment on ECI Sites by Occupation in 1989

Occupation	Percentage of employees
Welders	11.6
Platers	4.0
Scaffolders	0.8
Riggers/Erectors	9.8
Pipe Fitters	15.0
Electricians	3.5
Instrument Fitters	1.6
Mechanical Fitters	8.5
Other Manuals	23.4
Total Manual Occs	78.2
Managers	2.1
Supervisors	10.5
Draughtsmen	0.2
Other Non-manuals	9.0
Total	100.0

Source: Clifford (1990:18), based on EITB statutory returns.

Industrial Relations Characteristics

Employers

There are 5 employers' associations representing contractors in the ECI. The Oil and Chemical Plant Constructors' Association (OCPCA) represents companies designing and managing the erection of process plants, i.e. managing contractors. It has approximately 60 major members (full and affiliate status). It was formed in 1967 from contractors previously in membership of

the Federation of Civil Engineering Contractors. The 300 or so members of the National Engineering Construction Employers' Association (NECEA) cover the whole spectrum of engineering construction work and employ approximately 75% of employees in scope of the National Agreement (NEDO/NJC, 1988). NECEA was formed in 1982 from contractors who were previously members of the Engineering Employers' Federation's construction site section. The Thermal Insulation Contractors' Association (TICA) formed in 1957 and has 175 members. It represents thermal insulation contractors. Electrical contractors are represented by the Electrical Contractors' Association (ECA) and the Electrical Contractors' Association of Scotland.

Trade Unions

Seven trade unions signed the 1981 National Agreement. The Amalgamated Engineering Union - Construction Section (AEU-CS) (previously the Constructional Engineering Union) mainly represented riggers/erectors, crane drivers, scaffolders, and some welders. The Amalgamated Engineering Union - Engineering Section (AEU-ES) mainly represented mechanical fitters. The Electrical, Electronic, Telecommunications and Plumbing Union (EETPU) mainly represented electricians, cable-pullers, and pipe fitters. The Amalgamated Society of Boilermakers, Shipwrights, Blacksmiths and Structural Workers (ASBSBSW) represented welders and platers. The National Union of Sheet Metal Workers, Coppersmiths and Heating and Domestic Engineers (NUSMCHDE) mainly

represented sheet metal workers and platers. The Transport and General Workers Union (TGWU) represented ladders, semi-skilled, and unskilled workers. The General and Municipal Workers Union (GMWU) represented the same constituency. The National Engineering Construction Committee (NECC) is a joint body comprising the unions in the ECI. Precise figures on union density in the industry are not available. The 1972 Commission on Industrial Relations report noted that for the Alcan site in Northumberland 'we found that union membership among the craftsmen was very high' (p.14). The interviews in 1991 with site participants at 4 sites in 1991 painted a similar picture. Further, the archive research covering the period 1960-1990 provided no evidence that unions have been concerned at falling membership on large sites.

Collective Bargaining Agreements

In the 1960s and 1970s there were a number of agreements under which workers on ECI sites could be working. There were agreements at national level, site level, and firm level. Relevant national agreements were the Mechanical Construction Engineering Agreement between the EEF and unions, and the Thermal Insulation National Agreement between TICA and the TGWU and GMWU. Both of these agreements gave a great deal of scope for variation by firms at site. Relevant site agreements were the BP site agreements at Grangemouth, Baglan Bay, Hull and Llandarcy, and the Shell site agreement at Stanlow. These agreements attempted

to impose uniform conditions of employment throughout particular sites. Relevant firm-level agreements were the ones made by Redpath-Dorman-Long with the CEU in the late 1960s.

In 1981 a comprehensive national agreement was signed. The national agreement superseded these previous agreements on ECI sites.

out-come of contract?

3.4. Research Methods

From the Abstract to the Concrete

The first section of this chapter put forward reasons why a case study of the ECI was a useful concretisation of the more abstract aim of studying the links between industrial relations and economic performance. The precise focus of this study, however, is upon industrial relations and economic performance on large sites, 1960-90, in the ECI. Further justification is required for these additional elements defining the field of study.

The concentration is solely upon the large site sector of the ECI because adequate data pertaining to economic performance only exists for that sector. Moreover, documentary records concerning industrial relations in small sites and for repair and maintenance in the ECI are much less common than records concerning industrial relations on large sites. Further, it is the characteristics of the large site sector in particular which

allow the study to address the British worker thesis and to address issues concerning the ECI as a prototypical organisation of production.

Why?

The time period, 1960-90, has been chosen because this allows the study to embrace a dynamic focus, and because it is these years in which issues concerning the British worker question are most prevalent.

Sources

The first stage in examining the role of industrial relations in the changearound in economic performance in the ECI was to address the quality of the data on economic performance. This process is spelled out in detail in chapter 4 and appendix 1. Once this was complete it was necessary to examine why the turnaround occurred. Two main research methods concerning primary evidence were used - interview and observation, and archive work.

1. Interview and Observation

Interviewing took place at two levels - with national actors and with site-level actors.

a. National Actors

Semi-structured interviews took place with 2 national trade union officials, 5 national employer association officials, a former Minister of State, a NEDO official, and a corporate-level client management official. These interviews were carried out primarily for the purposes of examining the political and economic origins of the 1981 national agreement.

b. Site-Level Actors

A total of 32 working days was spent at 4 large ECI sites in spring/summer, 1991. Site-based research was undertaken because it was considered that whilst the available documentary evidence was useful in examining issues of collective bargaining there were a number of issues which it could not address. Most important here are the client-contractor and inter-contractor relationships. These issues are addressed in a number of the published materials referred to earlier in the chapter, but at best only receive a parenthetical mention in the primary documentary evidence available. It is not accidental that documentary evidence concerning capital relations is difficult to obtain. These relations are fraught with conflict, with frequent claims and counter-claims concerning terms of contracts, their specification, and their fulfilment. A key characteristic of this conflict is that it is often covert. Little original documentation concerning such conflicts is available to the researcher. Given that an understanding of capital relations is essential to the thesis, this situation necessitated a site-based research strategy. Clearly, in addition, such a strategy allowed

a more subtle and fuller picture of contractor-worker relations to be formed.

4 sites were chosen because the aim was not to undertake an in-depth study of one site, but rather to obtain an overall understanding of the nature of capital relations, and industrial relations on large ECI sites in 1991. The relevant characteristics of the 4 sites are given in table 3.2.

Table 3.2. Characteristics of the Sites Studied

Site	Plant Type	Contracting Form
A	Process Plants	Mixed (1)
B	Process Plant	Direct with Client
C	Nuclear Power St.	Direct with Client
D	Process Plant	Managing Contractor

Note 1. There were a number of different sub-projects at Site A. The main plant was constructed with the contractors in a direct contractual relationship with the clients, whilst the other plants used a managing contracting system.

Interviews were undertaken with client officials, managing contractor officials, contractor officials, union FTOs and shop stewards. Interviewing was semi-structured and concentrated on gaining information concerning material practices rather than attitudes. Preliminary site visits and preliminary examination of documents relating to the site held at the offices of the

National Joint Council for the industry would often suggest a particular incident or area of interest. Questions were then asked of interviewees concerning their roles in these areas. On several occasions specific interviewees were also asked about specific incidents relating to projects in the 1970s and 1980s. These individuals were located by their name appearing both in historical archive material as well as in documents relating to the current projects.

The brief description above of the conflictual capital relations in the industry will suggest to the reader that interviews with management officials may have been problematic in terms of eliciting reliable information concerning practices in the commercial arena. Indeed, this was the case. A substantial amount of time in interviews with management officials was spent convincing the interviewee of my neutrality, and reassuring the interviewee of the conditions of anonymity and confidentiality. My 'credibility' in this respect was enhanced in having previously secured the acceptance of the National Joint Council for my research. I was satisfied that the interviewees talked freely and frankly. However, in two instances management officials refused to discuss any details of current contractual disputes.

In addition, as the opportunity arose, observation was made of meetings. These were :- at site C, a client-contractor meeting; at site A, a Project Joint Council (PJC); at site B, a PJC training sub-committee meeting, a multi-contractor meeting, and

an internal client meeting; at site D, a workplace induction session.

2. Archive Work

The primary archive material consulted can be divided into 3 main sources.

a. Modern Records Centre, University of Warwick

The following files were consulted :

- OCPCA files (filed under Refractory Users' Federation).

These are an extensive set of files relating to 1968-81 national and site level bargaining at Grangemouth, Baglan Bay, Seal Sands and Sullom Voe.

- EEF files. Minutes of stage 4 (national) meetings concerning the ECI from 1966 to 1975 were examined.

- AEU(CS) files. Minutes of biennial and special national conferences, and minutes of executive committee meetings, 1963-83, were consulted.

b. National Joint Council For the Engineering Construction Industry

Comprehensive files are held concerning both national and site level industrial relations issues since 1981. The national-level files were extensively examined, and site-level files relating

to seven projects were examined.

c. Miscellaneous

The following miscellaneous sources of documentary material were also consulted :

- AEU(CS) executive and conference minutes, 1985-91.
- EETPU files of a national official relating to the ECI, 1974-85.
- NEDO, miscellaneous files and minutes of meetings, 1972-85.
- OCPCA 1967 study of the causes of low productivity.
- EEF files relating to the negotiation of the 1981 agreement.
- CEGB evidence to the Sizewell 'B' Nuclear Power Station Public Inquiry, held at the Public Records Office, Kew, Surrey.

3.5. Conclusion

This chapter has put forward the case that the ECI is a useful site for a case study because it can be seen as a crucial case for the study of the thesis that labour militancy lay at the root of poor economic performance in the UK economy. Further, it is a useful site because the form of capital relations and the organisation of production can be seen as prototypical for the wider manufacturing economy. It is also important to study the ECI because it is strategically important to UK economy yet remains largely unstudied by the academic community. Finally,

the choice of the ECI also provides a crucial case in which to examine the transaction costs approach to economic organisation.

With these points made, the rest of the chapter laid out the relevant features of the ECI and the methods of the research that underlie the argument of this thesis. Here it was noted that the methods of examining the quality of the data on economic performance would be outlined in chapter 4. It is to this chapter and its wider discussion of the data on economic performance in the ECI to which we now turn.

CHAPTER FOUR

ECONOMIC PERFORMANCE DATA

4.1. Introduction

In this study, economic performance data have two roles. Firstly, they are used as indicators of potentially useful areas of research, i.e. the thesis aimed to study an industry in which changes in industrial relations were ostensibly linked to changes in economic performance. This role effectively lies prior to the substantive research. Secondly, they are used as an outcome measure which must be understood in terms of its expression of social relationships. There are two levels on which the concept of economic performance data as an expression of a social relationship can be understood - one more abstract and one more concrete. The abstract level refers to the level at which the social meaning of economic performance data can be discussed. Section 2 of this chapter engage with issues at this level. The second more concrete level refers to an understanding of the process of the creation of the data as a social and political process.

Section 3 of the chapter deals with issues concerning the source and quality of the data. Section 4 outlines the additional screening undertaken for the data on the 1980s. Section 5

presents the methods and the results of a statistical analysis of the relationship between economic performance and time.

4.2. Construction Schedule as a Measure of Economic Performance

Because the ECI does not have its own industry classification for the purposes of governmental statistics there are limitations to the type of data available relating exclusively to the industry (as opposed to relating to the whole construction sector). The only type of economic performance data available for the ECI is that relating to construction project performance on large sites against schedule, measured in units of time, usually months. From two measures, schedule and actual construction period, a third statistic, schedule delay, can be calculated by expressing the overrun (or underrun) of actual construction period against schedule as a percentage of the schedule.

A discussion of the social meaning of construction schedule delay should embrace an understanding both of what it does not express as well as what it does express. Firstly, it should not be regarded as a proxy for labour productivity. It is quite possible for labour productivity (output per personhour) to increase whilst performance against schedule deteriorates - for instance because of a ban on shiftworking which would be necessary to catch up a delay previously caused by a late material delivery.

Secondly, performance against schedule is not a measure of efficiency where efficiency is technically defined as increasing if a given output is produced with fewer inputs. Performance against schedule is an extensive measure of economic performance. It conveys nothing about the amount of inputs taken to complete a construction project in a certain time, e.g. a project built in 24 rather than 30 months can use up more inputs, perhaps through use of an additional shift. Therefore, in the same way an improvement in labour productivity need not imply an increase in production efficiency (in that an increase in labour intensity, an increase in input, may have caused the improvement), so an improvement in performance against schedule need not imply an increase in production efficiency. This distinction between an improvement in performance against schedule and an increase in productive efficiency is an important one to bear in mind for the arguments of the thesis.

Thirdly, performance against schedule is not a measure of economic performance of central concern to contractors. Clients' and contractors' interests differ such that a project may be built over schedule and over budget to the client's dissatisfaction, whilst the contractors can still generate substantial profits (the changing mechanisms of this are discussed in detail in chapters 5 and 6).

Performance against schedule is, however, a measure of economic performance utilised by clients in judging project performance. This statement is based on interview-based and document-based

research. In interviews with senior client management at the four sites visited, the unanimous response to an open-ended question on the subject was that performance against original schedule was the key criterion for clients of economic performance of projects. Documentary support comes from an internal B.P. document concerning the costs of implementing their key 1968 site agreement at Grangemouth in Scotland. This document stresses the importance of projects hitting schedule and lays out in detail the considerable costs associated with schedule delay. Such costs include not only extra interest charges on the capital released for the project, but often more crucially the opportunity cost of lost revenues from unrealised sales (of chemical products in this case) for the period of the delay. The 1970 NEDO report also puts forward similar concerns (p.12) :- 'the costs of delays in other sectors are harder to obtain but there is no doubt they are considerable. Thus the loss of gross profit resulting from a (not uncommon) eight month delay in the completion of a £15 million refinery project might amount to about £2.5 million. The delays in a chemical plant's completion is recorded as costing £7 million in terms of the additional imports required'. Further, the 1970 NEDO report quoted a report on investment by the Chemical Industries' Association which stated that the uncertainty in relation to construction to schedule was a vital factor in deterring client investment :- 'more important.... is the great variation that has taken place in the UK. This has made completion dates difficult to predict with confidence'(p.12). As such, the meaning of schedule delay has significance beyond Morris and Hough's

characterisation (1987:14) :- 'overruns are at minimum at least indicative of problems'. That other observers recognise the value of overrun measures is demonstrated by the fact that Morris and Hough can list 33 other studies which use the criteria of time and budget overruns as key measures of economic performance.

A strength of utilising performance against schedule as a measure of economic performance is that this measure relates to non-price competition. In chapter 2 it was argued that an important gap in the extant literature was that the measures of performance which were utilised ignored the increasing salience of non-price competitive factors, such as quality and performance against project schedules (with production increasingly organised on quasi-project bases), in capitalist development.

In addition schedule delay can be usefully characterised as being indicative of the relations of production. It is essentially a measure of how successful the client is in making the contractors build in a given period of time, which is itself partly a function of how successful the contractors are in securing the productivity of labour. As such, to adequately grasp the full meaning of schedule delay data a study of those very relations are necessary. Implicit in this approach is an examination of how sustainable are the improvements in economic performance for the future.

A consideration of economic performance data in the ECI cannot be complete without asking why only data relating to schedule

delay are available. Here it should be recalled that schedule is a measure utilised by clients, not contractors, and pertains to client, not contractor, criteria. The point is that there are no data which relate directly to the economic performance of contractors and their workforces. The lack of such data is both a weakness and a strength for this thesis. It is a weakness in that such data could have proven highly instructive in comparing and contrasting movements in measures of economic performance relevant to both clients and contractors. It is a strength in that it offers a considerable insight into the nature of client-contractor and inter-contractor relations, and in that it highlights the status of data on economic outcome not as objective truth but as the outcome of a political process. These points warrant amplification.

Contractors have sought to withhold data on productivity from clients. The first example of contractors refusing to divulge productivity information to clients came in 1978 at the BP site in Grangemouth. The client, aware that the site agreement was often being ignored by contractors, instigated an audit system, part of which entailed contractors detailing weekly productivity targets and outcomes. The contractors refused to supply such figures. This was echoed at the national level in the 1980s. Since 1983, as part of the national agreement, contractors on nominated sites are obliged to return certain information to a project auditor, an outside firm independent of contractors and clients. The auditor collates the information, reports to the Project Joint Council, and this report is then forwarded to the

NJC in London. The information returned by contractors to the auditors covers items such as workforce numbers, grades, payments, hours, time lost for disputes. A sub-committee of the NJC proposed that additional information should be returned concerning productivity, specifically relating to target time (in person-hours) for a piece of work against the actual time. The advocates of this were primarily the trade union officials and the NJC full-time staff. This proposal was blocked by the resistance of contractors. This resistance was justified in terms of the commercial sensitivity of such information. In effect the contractors were unprepared to divulge information which could be obtained by clients in a dispute over contract terms. This indicates the continued existence of conflictual, low trust relations between clients and contractors, and shows the limited forms of direct control that clients have over contractors.

It was the intention of the union officials and NJC staff that such data could have been collated and analysed at national level, and used as a benchmark against which to measure the economic performance of the industry, with the aim being to improve that performance. Therefore, the contractors can be said to have frustrated both the process of the creation of the data concerning economic efficiency and attempts to improve efficiency. This a prescient observation which will develop into a recurring motif throughout this thesis. Within the current structure of relationships, not only do contractor interests counter those of economic efficiency, but, importantly,

contractors are in a position in which they are able to act on those interests.

4.3. Source and Quality of the Data

Data for construction performance against schedule comes from three main sources :- the 1970 and 1976 NEDO reports, and the 1988 joint NEDO/NJC report, The Project Record. It is the aim of this section to examine the quality of this data, with particular emphasis on examining for bias which may have the effect of overstating the improvement in performance in the 1980s.

Within this aim it is useful to conceptualise data creation as comprising four stages in each of which bias can exist - internal recording by clients, clients reporting to an agency, agency recording, and agency reporting. With this categorisation in mind a number of questions will be addressed.

The first question is whether any systematic bias exists in the internal recording/measuring process by clients. The argument here is that if schedule delays, as measured internally by clients, were high in the 1970s and low in the 1980s this may be a function of the client coming to anticipate schedule delays and precluding such delays by lengthening the original schedule. Given that very few projects are identical replicas of previous projects it is difficult to give a definitive answer to this.

The balance of the evidence suggests that this has not occurred. The one clear instance in which a schedule for a similar project has been lengthened is Heysham 2 nuclear power station built for the CEGB. Here, Morris and Hough note that '50% more programme time was allowed for Heysham 2 than for Hinkley Point B, resulting in a 78 months programme for the first unit' (1987:123). However, further evidence and analysis suggests that this is not true for the rest of the industry. In interviews (see note 1), senior client management argued strongly against any such increasing occurrence of contingency being built into schedules within their own corporations. Indeed, on site A it was stated (and documents confirmed) that the proposed construction schedule had been unilaterally cut by two months by the Board member responsible for construction. Documentation at the NJC offices provided evidence of a wider scope than that covered by the four clients whose sites were visited. This showed that according to pre-project discussions between the client and the NJC 3 projects had been set to be shorter than previous similar projects in the UK. None of the discussions showed a lengthening of schedules.

Moreover, analytically, the argument that clients would tend to lengthen their schedules to anticipate delays can be shown to be ill-founded. The point here is that, after the North Sea-related boom of engineering construction in the 1970s capital investment decisions for the clients in the 1980s became increasingly marginal, both in terms of whether it was built at all, and in terms of whether it was to be built in the UK (rather than

elsewhere in Europe). If these decisions were increasingly marginal it is implausible that clients would react by lengthening schedules in anticipation of delay, rather they would not build at all, or they would build elsewhere in Europe. Indeed, this far stronger argument implies that any bias would likely to be in the opposite direction.

The second question concerns potential bias in the stages of agency (i.e. NEDO) recording and reporting. To assess relevant issues here, a member of the statistical working party for the 1970 report, and the NEDO official who was the central author of the 1976 and 1988 reports were interviewed, and the documentation concerning the data recording and reporting for the 1988 report was examined. Documentation pertaining to the compilation of the earlier reports could not be located.

This research indicates that while the framing of the questions and reporting of the answers in the 1970 and 1976 reports appeared to be free from systematic bias, clear evidence exists of bias in these areas for the 1988 report. Importantly, this differentiation in bias was openly stated by the NEDO official. He stated that the 1976 study was 'objective' and that 'it would have been difficult to portray the situation worse than it actually was'. He also stated that the 1988 report was 'basically a PR exercise', seeking to attract new investment by casting a picture of success for the industry. By contrast, the findings of the 1976 report were deemed to be so damning that NEDO had decided not to publish the report, and were ultimately

prompted into publishing it only by a leak of some of its findings to the press. The decision not to publish hardly conforms with a pre-set agenda of deliberately creating data reflecting poor performance. The lack of such a pre-set agenda is also indicated by the fact of the two UK power stations chosen for case study, one was chosen as a relatively poor performer, whilst one was chosen as a relatively good performer.

The bias in the framing of the questions in the 1988 report is evident in the following extracts taken from letters to clients requesting information :- 'it is appropriate to state that clients for whom projects have been completed in this period are satisfied with the contribution made by the NJC towards improvements in industrial relations', [NEDO and the NJC are] 'now concerned with developing promotional material about projects which have been successfully completed under the NAECI'.

Bias in the reporting stage also existed for the 1988 report. Whilst the report purports to outline performance against schedule of all nominated projects since 1981, for a number of projects the phrase 'to client's satisfaction' appears in the performance column. The phrase was used when it was not easy to elicit information from clients. Bias existed in that the authors of the report did not pursue the issue if they believed schedule delay existed in the particular case.

The third question concerns potential bias in the reporting by the client. The issue here is whether the motivation to report

accurately their project's performance differed systematically between the NEDO reports. There are a number of possible arguments here. Firstly, it could be argued that clients were motivated to over-state the extent of schedule delays in the 1970 and 1976 reports by a desire to create a climate in which pressure for the negotiation of a national agreement could be achieved. This already tenuous argument is undermined by the observation, outlined in chapter 8, that any motivation amongst clients to achieve a national agreement was not strong at the time. Secondly, it could be argued that motivation to respond accurately varied between reports because of differing conditions of anonymity - anonymity existed for project and client in the 1970 and 1976 reports, but not in the 1988 report. As such, it can be plausibly argued that clients were motivated to over-state the success of their projects in the 1988 report compared to previous reports. This argument concerning bias clearly works in the same direction as the bias that was said to be created through the recording and reporting of the agency, i.e. it would overstate the improvements in performance.

The final question on the quality of the data to be addressed concerns issues of representativeness for the period and for the industrial sector. For the period from the mid-60s until the introduction in 1981 of the national agreement, the 1970 and 1976 reports give data for 58 projects. Two issues must be discussed here - the significance that these projects do not constitute the whole population of large projects for the period from the mid-60s to 1976, and the significance of the gap for 1976-81 for

which no data exist.

Whilst the sample contained in the 1970 and 1976 reports cannot be said to be random, nonetheless there are no reasons to believe that it is systematically biased in a manner which would strengthen the expected relationship.

It is possible to judge the 1970 NEDO statistics on power station delays against statistics contained in the 1969 Report of the Committee of Enquiry into Delays in Commissioning CEGB Power Stations (Wilson Report). The Wilson Report supplies data on power station delays in the 1960s in a different form from that in the NEDO reports, putting the number of power station units subject to 0-6 month delay, 7-12 month delay, and over 12 month delay. Table 4.1. shows the 1969 Wilson report data on the 70 units released for construction by the CEGB between 1959 and 1967. The Wilson Report provides data for the total population of power stations in this period.

TABLE 4.1. Wilson Report - Power Station Delay Data

		Delays in Months		
		0-6	7-12	Over 12
No. of units	Definite	10	8	10
	Forecast	16	6	20
	Total	26	14	30

The 1970 NEDO data on power station delays, covering 48 units, can be similarly broken down into these categories and a

comparison can be made. This is shown in table 4.2..

TABLE 4.2. Comparison of Wilson Report and 1970 NEDO Data on Power Station Delay

		Delays in Months		
		0-6	7-12	Over 12
Percentage of units	Wilson	37.1%	20.0%	42.9%
	NEDO	45.8%	16.7%	37.5%

The close comparison of percentages in each category indicates that the 1970 NEDO data appears not to be an unrepresentative indication of power station project performance in the 1960s. It should also be noted that the 1970 data show a slightly superior performance than that in the Wilson report. This will serve to attenuate rather than strengthen the expected relationship between time and performance.

Moreover, it can be legitimately argued that the manner of sampling from non-power station large sites for data for the 1970 report contained a bias likely to weaken the expected relationship. This is because the data for the 1970 report is 'based on information submitted by most of the major clients in the industry' (1970:125) (emphasis added). The point here is that it was the major (i.e. regular) clients who contributed information. It is very likely that project performance for major clients would be superior to that for occasional clients. This is because occasional clients are more likely to neglect pre-planning and organisation, in favour of the incentive of bonus payments. This point is elaborated in subsequent chapters.

The argument that the 1976 report is free from systematic bias is supported by evidence at the Sizewell B public inquiry. When a CEGB witness at the Sizewell B enquiry attempted to discredit the 1976 NEDO report by arguing that it sought to deliberately show an inferior UK performance in the case studies chosen he ultimately had to concede that the postal survey section of the report largely undermined criticisms of selectivity bias :-

'Q: you made the point about selection and bias in relation to the selection of the projects, and when I was looking at page 8, you made the point about the selection of the project....Of course NEDO did endeavour to check that, didn't they, and we see on page 23, that they carried out certain postal surveys, because they were well aware of the bias of selectivity.... they were perfectly well aware of the set of reservations you had in mind?....

A: I accept that sir.' (Sizewell:day 80, page 38).

The complete gap for 1976-81 is a considerable weakness in the available data but not seriously damaging in terms of its use in the thesis' overall argument. If (as is indeed the case) the data show a clear improvement in performance after 1981 compared to the 1960s and 1970s it could be argued that this improvement started to occur in the 1976-81 period for reasons unrelated to the 1981 national agreement. Two points can be made in reply to this. Firstly, there are no indications that such an improvement occurred in this period - indeed a minute from a NEDO meeting in

1980 states that 'no major project has come in anywhere near schedule recently'. Also, the 1979 Price Commission report noted the continuing delays in power station construction :- 'many large capital construction projects, power stations in particular, have experienced delays in completion in recent years. CEGB conventional coal and oil-fired stations which have been ordered for commissioning in the last 15 years have suffered delays ranging from 4 months to 4 years on a completion time of 6 years' (1979:21). Further, the Monopolies and Mergers Commission report on the CEGB, published in 1981 and therefore also relevant to the missing period, states that 'the 5 conventional stations currently under construction are expected to be delayed on average by 2.3 years'. Secondly, there are no adequate explanations of why such an improvement should occur in the period. There are competing explanations of the turnaround in economic performance which are discussed throughout this thesis, but the important point is that they all construct an argument from occurrences in the 1980s.

There are fewer issues of concern relating to the representativeness of the sample for the 1980s. The 1988 NEDO/NJC report lists all the nominated projects under the NAECI, plus three non-nominated projects. This approximates very closely to the whole population of large projects in the ECI. Nomination is effectively defined to encompass all large ECI projects. The inclusion in the 1988 report of the data on 5 non-nominated projects can be seen to be a function of the systematic bias in the NEDO/NJC reporting process in that they were all

completed successfully against schedule. Therefore, these 5 projects have been excluded from the analysis undertaken in this thesis.

Summing up this discussion of the quality of the data, some bias may exist in the internal client measurement process, and more seriously in the reporting/recording and response stages. The client measurement bias will serve to mollify a correlation between an improvement in economic performance and the 1980s, whilst the other form of bias would serve to strengthen the relationship. Given that the existence of this relationship is an important starting point of this thesis the sources of bias identified in the 1988 study were addressed by undertaking an in-depth screening of the data for the 1980s.

The screening process sought to obtain data for project performance against schedule which corresponded as closely as possible to the clients' internal measurement. Firstly, a survey was circulated direct to clients asking for information on performance against schedule. Although this questionnaire was extremely short and guaranteed confidentiality and anonymity only one client replied. Secondly, a systematic check on files relating to all projects held in the NJC offices was undertaken. The minutes of Project Joint Council meetings for nominated projects include reports by the client or the managing contractor of progress against schedule in percentage terms, e.g. it is reported that the project is 25% complete against a target of 28%. If these reports consistently indicated that the project

was on or ahead of schedule, and if this corresponded with the information in the files on the 1988 report, this was taken to be sufficient evidence concerning project success. If there was no explicit information on the length of schedules the length of the project was taken to be the time in months between the first and the last PJC meeting. Whilst this will not correspond exactly with the project lengths there are no reasons to believe that it is not an adequate proxy.

However, if the PJC progress reports did not consistently indicate that the project was on or ahead of schedule, it was decided to rely on more than these reports. This was because of a project runs behind schedule there is a tendency among managing contractors to redefine the schedule, i.e. lengthen it, thereby putting the project back on schedule. Because this redefinition is often part of a process of renegotiating terms of the contract the PJC reports often do not carry details of this redefinition. Note that the process of lengthening the schedule during the project is a distinctly different one from that of lengthening it prior to the project. The latter process was discussed earlier in relation to potential bias. Given that a lengthening of the schedule during construction must be interpreted as a constituting a de facto overrun, further investigation was required. To ascertain the original schedule length and the actual schedule overrun other documents, including the minutes of the pre-project client-NJC meeting, and post-project correspondence between the client and the NJC were examined. In this way the systematic bias in the data for the 1980s was

satisfactorily reduced such that the data can now be said to correspond closely to the clients' internal measurement.

4.4. Methods and Results

To test for a relationship between economic performance and time the following were undertaken :-

a. Mean construction delay statistics (i.e. overrun divided by original construction schedule, expressed as a percentage) were calculated for a number of time periods (the 1960s, the 1970s, the 1960s and 1970s combined, and the 1980s) and compared.

b. A statistic for the percentage of projects subject to construction schedule delay was calculated for each of the above periods and compared.

c. The above calculations were undertaken for all projects, all projects excluding power stations, where possible, and for power stations alone, where possible (see appendix 1). This was done in order to test for the possibility that power station projects' performance may differ systematically from that of other projects. If there is such a difference an over-representation of power stations on one of the time periods may invalidate any attempt to generalise for the whole of the large-site sector.

The results are given in tables 4.3. and 4.4..

Table 4.3. shows the mean schedule delay and the percentage of

projects subject to delay for the 1960s, 1970s, and 1980s separately.

TABLE 4.3. Schedule Delay and Projects Subject to Delay - 1960s, 1970s, and 1980s

Period	No. of Projects	Mean Schedule Delay (%)	Projects Subject to Delay (%)
1960s	35	20.6%	82.9% (2)
1970s	23	39.0%	- (1)
1980s	26	7.4%	15.4% (2)

Notes. 1. It was not possible to calculate this statistic from the 1976 NEDO report.

2. This is a cumulative figure based on subtracting the projects which underran from those which overran.

Table 4.4. shows the mean schedule delay and percentage of projects subject to delay for the 1960s and 1970s combined and the 1980s.

TABLE 4.4. Schedule Delay and Projects Subject to Delay - 1960s and 1970s Combined, and the 1980s

Period	No. of Projects	Mean Schedule Delay (%)	Projects Subject to Delay (%)
1960s/70s	58	27.9%	- (1)
1980s	26	7.4%	15.4%

Notes. 1. It was not possible to calculate this statistic from the 1976 NEDO report.

The above tables refer to all projects without separating out power stations. Table 4.5. gives the same statistics, this time separating out power stations for the 1960s.

TABLE 4.5. Schedule Delay and Projects Subject to Delay - 1960s
for Power Stations and Others

Project Type	No. of Projects	Mean Schedule Delay (%)	Projects Subject to Delay (%)
Power Stations	13	17.0%	100.0%
Others	22	22.7%	72.7%
All	35	20.6%	82.9%

Table 4.6. gives the same statistics, this time separating out power stations for the 1980s.

TABLE 4.6. Schedule Delay and Projects Subject to Delay - 1980s
for Power Stations and Others

Project Type	No. of Projects	Mean Schedule Delay (%)	Projets Subject to Delay (%)
Power Stations	2	- (1)	- (1)
Others	24	8.0%	20.8%
All	26	7.4%	15.4%

Notes. 1. It was not considered useful to calculate statistics for the 2 power station projects.

It was not possible to separate out power station projects from other projects in the 1976 NEDO report data.

4.5. Analysis of Results on Economic Performance

A clear, strong relationship between economic performance and time exists given that the mean construction schedule figures fell considerably both between the 1970s and the 1980s (from 39.0% to 7.4%) and between the 1960s and 1970s together and the 1980s (from 27.9% to 7.4%). There was also a large fall in the percentage of schedules subject to delay. In the 1960s 82.9% of projects were subject to construction schedule delay, whilst in the 1980s 15.4% were. Another important finding is that despite the relative improvement a not insubstantial proportion of projects continued to overrun construction schedule in the 1980s. y wk.

From the statistics available for the 1960s, power stations, rather than performing significantly worse than other projects, performed slightly better than other projects in terms of mean schedule delay (17.0% against 22.7%). This serves to allay fears that an over-representation of power stations in one of the periods could endanger any attempt to generalise for the whole of the large site sector.

Given the finding of a strong relationship between schedule delay and time, what conclusions can be drawn? A simple causal relationship between time and economic performance is not being suggested. Such a causal link was suggested by one management official who argued that the ECI could be defined as a young industry which was naturally learning and improving over time. Such a view is inadequate, however. It proposes no concrete link

between the two variables, and it is profoundly asocial and apolitical. Even if the metaphor of learning is taken as useful it must be recognised that learning itself is a social, political, and not automatic, process - as Deutsch argued, power is 'the ability to afford not to learn' (1963:111).

Rather than indicating a simple causal relationship between the two variables the statistical relationship leads the observer to ask what occurred in the 1980s to cause such an improvement in construction performance against schedule. The statistical relationship in effect begs the questions which this thesis seeks to address as part of the wider aim of analysing the links between industrial relations and economic performance. The question also remains concerning the persistent and not insignificant schedule delays in the 1980s.

4.6. Conclusion

This chapter has discussed the meaning and nature of economic performance data in the ECI with particular stress on its social meaning and on its quality. Results have been presented which show a clear relationship between economic performance and time, with a substantial improvement occurring in the 1980s. The causes of this improvement cannot be simply deduced from the data but must be addressed by examining the changing social relations of production. Within this general aim the following chapter will focus on the relationship between capital and economic

performance in the 1960s and 1970s.

Notes

1. In interviews with senior client management the issue was not probed through a blatant questioning of whether they had lengthened the schedule in anticipation of delays, because such a form of question would very likely elicit an automatic, defensive, negative reaction. Rather, the matter was raised in a deliberately more subtle, almost parenthetical, manner by, in asking about schedule lengths, enquiring whether any buffer time period existed in the schedule.

CHAPTER FIVECAPITAL AND ECONOMIC PERFORMANCE IN THE 1960s AND 1970s5.1. Introduction

'Ensuring continuity of attendance and consistency of performance by subcontractors now poses as great a constraint over management planning of production as any union influence over output and work organisation' (Evans, 1990:248).

'The primacy of the merchanting role is an inevitable outcome of the historical development of the contracting system in Britain. One result is a weakening of the coercive pressures of accumulation in revolutionising the productive methods of the industry and forcing producers towards the known limits of productive efficiency' (Ball, 1988:96).

Both Evans and Ball, in their respective pieces, argue that the structure of capital and the relations between units of capital are key determinants of economic performance in the wider construction industry, such that peculiarities of the contracting system, as it has developed in the UK, serve to hinder longer term gains in economic efficiency. The thrust of the analysis

of the ECI in this thesis concurs with this approach.

However, two important extensions within my approach as compared with that of Evans and Ball must be highlighted. The first point is that this chapter will attempt a far deeper integration of empirical evidence with analysis than achieved by either of the above authors. Although Evans writes that his article is based upon 'some 150 interviews with managers, sub-contractors, employers' organisation and trade union representatives, workers, and public authority clients at sector, firm and site level involving fifteen sites in two major local labour market areas' (p.249) the reader is left unsure in what way, and how far, evidence informs analysis. Evans makes important suggestions :- 'under the contracting system difficulties predicting tender prices generate pressures to realise profits by maximizing extra claims against clients. Improving efficiency is subordinated to the aim of avoiding risk and maintaining flexibility of financial assets for investment wherever is most profitable, inside or outside construction' (p.245). However, empirical evidence to substantiate these points is not provided.

The second important extension is that this thesis will attempt to extend their analysis of the structure and relations of capital and the impact of these on economic performance. This is clearly related to the first point in that it is only possible to move beyond the level of the generality with the aid of analysis grounded in empirical evidence.

The following two chapters seek to integrate evidence and analysis in a nuanced account of changing capital structure and relations and their impact on economic performance, primarily measured in terms of performance against construction schedule. The two chapters will address two separate but logically connected questions :

-what caused the delays in the 1960s and 1970s?

-why has there been an improvement in the 1980s?

This chapter deals with the role of capital in relation to the first question, and chapter 6 examines this in relation to the second question.

The chapter addresses the issues by, firstly, examining evidence relating to attitudes, and, secondly, examining evidence relating to practices. Much of the evidence relating to practices is derived from original on-site research. An additional section of the chapter considers how far it is legitimate to infer from this evidence across time.

5.2. Capital in the ECI - an Introduction

It is useful to break down the concept of capital into a number of sub-categories along two dimensions. Firstly, capital structure should be differentiated from capital relations. Capital structure refers primarily to the size, the number, and the specialisation of firms engaged in the industry. The concept of capital relations refers to the manner in which these firms

interact. The two are not unrelated but can be seen to be conceptually distinct, and it is important to have an understanding of both elements in order to formulate an adequate analysis.

The second dimension relates to the different structural positions of sectors of capital in the ECI - namely the differentiation between client capital and contractor capital.

An important element here is the precise form of the contractual relationship that exists between the client and the contractor. Such contractual relationships can take a number of forms, ranging from a fixed-fee construction-only contract to a fully reimbursable design-and-build contract (see glossary for a list and brief explanation of different contractual forms). It will be noted that the issue of design has been included in the analysis. This requires some explanation in that this thesis is primarily concerned with economic performance in the construction phase of the project schedule whilst design is essentially a pre-construction phase. There are, however, strong analytical reasons and empirical evidence to suggest that economic performance in the construction phase is intimately linked to the issue of design.

A discussion of client-contractor relations must do more than simply examine the precise forms of contractual relationships, important as these are - rather the nature of their relationships must be understood, with relationships here having a wider

meaning than the narrow one implied by the term 'contractual relationship'. Relevant concepts in delineating the nature of this relationship are those of power, of control, of conflict, of co-operation, and of trust.

Inter-contractor relations will also receive attention within this chapter. The point made above concerning the need to examine both the technical form of the contractual relationship, as well as the nature of the relationship is also relevant here. An important element which should be covered in a discussion of contractor relations is the issue of late delivery of plant and materials to the site. Whilst in a narrow sense this can be regarded as a pre-construction phase the argument for including it in this analysis is just as compelling as the arguments made above concerning the inclusion of design issues. The 1970 NEDO report deliberately omitted consideration of delivery problems :- 'to have pursued delivery problems to their source - through suppliers to their suppliers to the availability of raw materials - would have involved following a trail through a large segment of the economy, and grappling with general commercial and fiscal questions for which we were not specially equipped' (p.14). This approach stresses the technical nature of the problems. A more adequate approach is to examine delivery of materials and plant to the site as a political and economic process intimately linked to issues of inter-contractor relations.

5.3. Evidence on Attitudes

Evidence on attitudes of contractors themselves and public bodies concerning the relationship between capital and economic performance in the 1960s and 1970s can be found in a number of sources - the 1970 NEDO report, the 1967 unpublished internal report by the Oil and Chemical Plant Constructors' Association, the 1969 Wilson Report, and the 1981 Monopolies and Mergers Commission report. Each of these will be examined in turn.

The strongest, most direct, and most illuminating evidence is contained in the 1970 NEDO report. The NEDO group undertook a survey of contractors in which 86 head office questionnaires and 260 site questionnaires were returned. Specific consideration is warranted of the contractors' replies to the question which asked them to choose the most important reasons for delays from a list of possible reasons. The results are reproduced in table 5.1..

Table 5.1. 1970 NEDO Survey - Causes of Delay

<u>Reason for Delay</u>	<u>Percentage of Companies Ranking as First</u>
Late Design Changes	27%
Late Delivery of Plant/Materials	21%
Unexpectedly Low Labour Productivity	10%
Other Contractors' Performance	8%
Labour Disputes	8%
Delays in Subcontractors	8%
Access*	7%
Skilled Labour Shortages	5%
Clients' Performance*	1%
Faulty Materials	1%
Management Problems More Difficult than Anticipated	1%
Faulty Workmanship	1%
Total	98% (note 2)

Notes 1. Contractors were asked to indicate from a pre-set list of possible reasons, the ones they regarded as most important. A space was also provided for respondents to write in non-specified reasons. Those categories marked with an asterisk were created from written-in replies.

2. The report does not specify why the percentages do not add up to 100%. The 2% shortfall could, therefore, arise

from rounding-off and/or the existence of small unspecified categories.

In examining this table it is useful to group the individual reasons for delays under the broader, more analytically based headings:- 1) Labour-related, 2) Pertaining to capital relations. Table 5.2. gives a breakdown of table 1 into the two categories, by first choice.

Table 5.2. - Categorisation of 1970 Survey

See also

<u>Reason for Delay</u>	<u>Companies Ranking as First</u>
Labour-related	24%
Pertaining to Capital Relations	74%
Total	98% (note 2)

Notes 1. 'Labour-related' category comprises 'low labour productivity', 'labour disputes', 'skilled labour shortages', 'faulty workmanship'. 'Pertaining to capital relations' comprises all other categories.

2. See note 2 for table 5.1. above.

An analysis of the survey results must start from an understanding of the basic question - what information is being reported? The simple answer is that managerial staff of contractors in the ECI replied to a NEDO group survey question concerning the causes of delay in the construction of large

sites. There are a number of implications of this. One is that it is a subjective assessment. The tables contain information concerning attitudes about practices rather than about the practices themselves. That the question on the survey refers to the general phenomenon of delays on large construction sites rather than focusing on the reasons for delays in particular instances serves to militate against the results as an effective proxy for practices. Against this is the fact that the respondents are the very people who have experienced delays, and who have witnessed the practices that cause delays.

Whether the attitudes reported can be taken as an effective proxy for actual practices will also depend upon the possibility of bias existing. Bias can exist in a number of areas. The size of the survey is relevant - can 86 head office level replies and 260 site level replies be assumed to be a representative sample of contractor management attitudes? The NEDO report states that 'data were received on 43 of the NEDO list of large sites' (p.71). This NEDO list of large sites is given on page 11 of the report, and contains 51 projects under construction. Therefore, 43 out of 51 projects have been covered by the survey. This wide coverage of the survey suggests that unless there are compelling reasons to the contrary the results should be taken as strongly indicative of contractors' attitudes. No such compelling reasons exist.

The next question to consider is whether contractors' reported subjective attitudes towards practices will differ systematically

from the actual practices. Bias is likely to exist because they reported their attitudes for publication to a NEDO group. The NEDO group had been set up under the terms of reference "to inquire into the problems of organisation of large industrial construction sites with particular reference to labour relations, to investigate their causes and their effects on the cost of commissioning and operating plants, and to make recommendations'. The NEDO group was established, therefore, with clear public policy implications with particular reference to labour problems. Given this, contractors can be seen to be less likely to blame themselves (as a group as well as individually). Moreover, it is clear from the form of question asked by the NEDO group to the contractors (and indeed by the general tenor of the survey itself) that the NEDO group, following its terms of reference, particularly focused on labour-related issues. This is evident in that of the ten pre-selected possible causes for delay in the question five pertained to labour-related issues. An opportunity was given for contractors to choose non-pre-selected reasons. All of the categories created from this related to capital rather than labour - 'access', and 'client performance'.

In sum, the findings reported in table 5.2. are biased to the extent that contractors are more likely to blame labour for delays, and that problems exist in that the table reports attitudes rather than practices, with the former a not wholly adequate proxy for the latter.

Despite the bias, the total score for labour-related items is

only 24%, whilst the percentage for the combined categories pertaining to capital is 74%. These are extraordinary statistics. In a questionnaire whose structure is likely to produce responses biased against labour, contractors, a section of capital in the industry, apportioned three times as much blame to issues connected with capital relations than to issues connected with labour. These findings indicate that issues within capital relations may well be the key determinants of the record of poor project performance against schedule in the 1960s and 1970s.

The second piece of evidence on attitudes concerns a report by a committee of the Oil and Chemical Plant Constructors' Association appointed to 'enquire into the whole aspect of low productivity on the mechanical construction side and to make recommendations on how productivity can be improved. The terms of reference were to study ways and means of achieving greater productivity in oil refinery and chemical plant construction work and to make recommendations in a report to the panel'. This committee was comprised solely of management staff of the individual member companies. Its report remains an unpublished internal document. Not untypically the report indulges in the troublemaker theory of labour causing delays ('troublemakers form a very small proportion of the total labour force, generally less than 2%. Although their proportion is small it is estimated that they cause at least 80% of all work stoppages. Their motives are either political, social crusades, career forwarding agitation or psychological'). In this context of an anti-labour slant the

report ends with a striking conclusion :- 'the most important item which causes disruption of site operatives is the late arrival on site of materials or delivery in an incorrect sequence'. Therefore, an internal management contractor appraisal of economic inefficiency in the 1960s chose an issue which can be legitimately subsumed under the category of capital relations as the prime reason for low productivity.

Whilst the above two sources represent the most direct evidence on attitudes, public body examinations of the industry should also be examined. Two such studies of the industry focus exclusively on the power station sector - the 1969 Wilson Report and the 1981 Monopolies and Mergers Commission (MMC) Report. The Wilson committee comprised contractor management, civil servants and trade union officials. Their level of analysis is indicated by their own description of their approach :- 'to start off on the assumption that the CEGB and the contractors had by now evolved reasonably satisfactory remedial measures, and for us to try to see whether these measures were in fact being applied, and to form an opinion on the extent of their success' (p.1). The report which is ambiguous and inconsistent begins by arguing that the main overt cause of delays had been 1) adverse site conditions, 2) manufacturing difficulties, 3) an unusually high incidence of design faults, and 4) labour disputes on sites and the low productivity of site labour. It ends by saying 'the primary cause of the difficulties in constructing power stations efficiently has been a failure in long-term planning' (p.35).

The MMC in its 1981 report on the whole operations of the CEGB included a chapter on the construction of power stations. Once again the admission of their own approach leads the reader to wonder how illuminating the study will be :- 'in view of the extensive work carried out by previous inquiries, we have restricted our investigation of the construction of power stations to an examination of the way in which the CEGB is implementing its new policies' (p.250). As such, for the conventional power stations the report merely accepts the findings of previous public body reports into the industry. In relation to nuclear power stations the commission undertook additional research and analysis and argued that the origins of delays lay in design and technical problems, in construction starting before design was complete, and in the organisation of the contractor consortia.

5.4. Evidence on Practices - Primary Sources

Having examined the evidence on attitudes and briefly noted the findings of public body studies it is now necessary to examine evidence directly relating to practices. This form of evidence is to be preferred to evidence on attitudes but it is not without its own problems. In particular, such evidence will pertain to individual projects, and thus questions concerning the ability to generalise need to be addressed. Nevertheless, it is hoped that evidence from four nominated projects which is integrated into an overall analysis of the relationship between capital and

economic performance which itself corresponds with the picture from other forms of evidence will adequately deal with such problems.

The following section considers evidence from secondary sources whilst in this section evidence is examined which is derived from original research interviewing contractors and clients at site and national level. Given that this research focused on practices in the late 1980s/early 1990s whilst the focus of this chapter is on the 1960s/1970s some explanation is required.

There are two relevant points in justifying the inclusion of evidence derived from original research conducted recently rather than at the time. Firstly, existing evidence relating to practices in the 1960s and 1970s has important inadequacies. There are a number of important issues which such evidence failed to address. In particular, whilst such evidence acknowledged the potential existence of diverging interests between contractor and client, it failed to provide the reader with an understanding of the nature of the relationship between contractor and client. Correspondingly, it also failed to provide an understanding of the precise mechanisms through which the diverging interests of the client and contractor are played out in such a way as to impair performance against schedule. Lazonick's (1990) historical research on the cotton industry has shown how an understanding of such precise mechanisms can be crucial to an understanding of the relationship between the social relations of production and economic performance. Therefore, an important

gap exists in the extant evidence. The second point is that the inclusion of contemporary evidence fills this gap and is able to be generalised analytically. By presenting evidence on contemporary relationships inference can be drawn to apply to such relationships in the 1960s and 1970s. In the process of applying this inference it will be necessary to take into account any relevant changes in the environment surrounding and interacting with these relationships. As such the inference of such evidence across time must be supported by an additional argument. This additional argument will be spelled out after the presentation of the evidence.

Before the presentation of the evidence three methodological points should be made.

Most of the evidence is based upon accounts provided by individual respondents and unsubstantiated by other respondents. This raises the question of the reliability of such evidence. Given that a recurring overall picture of material practices emerges, and given that there exists no systematic motivation for interviewees to mislead in terms of over-stating the existence of practices outlined below, it can be argued that the problem of reliability has been adequately addressed. Moreover, the evidence is not based on interviews with one group of people alone, but upon interviews with contractor, managing contractor, and client, staff. This allows for the detection of possible serious divergences between these groups in the general thrust of their evidence, if not necessarily in the particularities of

the evidence.

Next, as mentioned in the chapter 3, gaining insights into contractor practices which can harm economic performance is not an unproblematic process. Given that revealing such practices does not place the interviewee in a favourable light, the interviewee's ability to communicate freely was largely conditional upon how convinced they were of assurances of confidentiality, independence, and anonymity. In that such conviction varied, the precise form of questioning in which I attempted to elicit information also varied. As such, the reader should bear in mind that the evidence below is not based on replies to uniform questions.

The final point concerning methodology is that if it became apparent in the interview that the respondent would not talk freely concerning the current project it was often profitable to direct questioning towards practices on the (named) project on which they had recently worked. Here it was particularly important to direct the interviewees to give specific information on actual practices rather than allowing them to make broad general statements.

Considering the very real problems of contractors' reluctance to divulge information and of gaining contractors' confidence, it is striking that seventeen of the twenty three contractor management staff gave information on concrete material practices which serve to further the contractors' interests of short-term

profit whilst harming the clients' interests of schedule completion on time. Of the six interviews in which no such evidence was forthcoming the following observations are relevant. Two interviewees were in the middle of the process of substantial claims and counterclaims with the client, an antagonistic process in which information is at a premium. These interviewees refused point blank to talk about tactics to make profit or the nature of their relationship with the client. One interviewee was an industrial relations officer who stated that he deliberately remained ignorant of contractual matters and he was unable (rather than unwilling) to provide relevant evidence. Three interviewees stated that their company did not undertake the practices outlined below. The sum of these observations is that of the twenty three contractors interviewed, seventeen gave direct evidence relating to practices outlined below, whilst only three stated that their firms did not undertake such practices. In addition, all the client managerial staff who were interviewed gave direct evidence.

Rather than presenting what each client and contractor said, one by one, it is more useful to look at the evidence in the context of examining the meaning and implications of certain important terms :- 'extras/on day rates', 'sitting on the job', 'underbidding', 'commercial scenario/withholding information' - terms which have common currency in the industry.

'Extras/On day rates'

These two terms, often although not necessarily, are used in tandem. The neo-classical theory of efficiency through competition as applied to the ECI suggests that at the stage when a contract for a piece of work is put out to tender the competitive process between the contractors should lead to increasing efficiency in the performance of contracts over time. The most efficient firms will be able to bid for a piece of work at a lower price and in a shorter time period than less efficient firms. These latter firms must be able to lower their bids through increasing the efficiency of the organisation of production or else they will be forced out of business. Underbidding may occur occasionally but ultimately those firms able to generate a profit will be able to survive. Here there is no consideration of the possible effects of diverging interests of the contractor and the client which could be damaging to economic performance.

The whole premise of this argument rests upon the assumption that the profit base for the contractor exists within the terms of the contract. This central assumption does not hold for large sites in the ECI. The site manager of contractor C.a. (see Note 1) put it succinctly :- 'the name of the game is going for all the extras you can get, that's what it's all about'. A manager of contractor C.i. said that 'getting extras is a key part of our strategy. We are always looking for changes [to the contract]'. The site industrial relations officer of contractor A.d. put it less bluntly :- 'on this contract there have been lots of modifications on day work rates which we're not unhappy with'.

The assistant site manager of contractor A.e. noted that the contract was on a 'very tight budget', and that they were 'relying on extras and claims to turn in a profit'. The manager at contractor B.a. said 'you always try to get extras and this contract is no exception'. The manager at contractor B.c. commented that the productivity estimates underlying the bid were 'deliberately optimistic', because they knew that 'there will be changes, and we'll have claims'.

Here is strong evidence that the basic assumption underlying the neo-classical approach is inaccurate; contractors tend to regard the terms of the contract established at the stage of their tender bid being accepted as 'the bottom line', as the client industrial relations officer at project B put it. There are a number of ways in which contractors can receive payment in addition ('extras') to this bottom line. This will occur if there is a simple change in the amount of work ('a scope change'), e.g. whilst the tender may specify installing 2,000 metres of pipes, the client may subsequently change this to 2,500 metres, and the payment will increase pro-rata by 25%. This is likely to lead to an increase in profits to the contractor in that if the contractor does not increase the overheads at site the average cost per metre of piping should fall.

As such, simple changes to scope will be welcome to contractors, but a more lucrative source of extra payment is work 'on day rates', where payment is not changed pro-rata with the amount of work. As a manager from contractor A.f. stated :- 'about 20% of

our site man-hours has been on work orders, which we're delighted with'. Rather, the contractor is able to charge the client a higher rate, i.e. day rate, in which all the additional labour and materials used by the contractor, plus a mark-up percentage of the order of 12.5 - 15%, is paid by the client. Whether the work is done on day rates depends on the implications and the timing of the changes requested by the client. If the work needs re-working of already completed work (perhaps because of a design fault, or because of poor work in the geographical area by another contractor, e.g. if the steel frames to carry piping are faulty in some respect) then this work will be on day rates. Similarly, if the work needed requires work where there is limited access because another contractor's workforce are in that area or because the work is in a confined, awkward space, the day rates will also apply.

Crucially, the contractor has an influence on whether extra work is paid pro rata or at day rates. It is important to note again the elements that determine if a job is paid at day rates - the implication and the timing of the changes. Whilst a contracting firm is undertaking a piece of work its staff will be aware of any inadequacies in the existing design or in the preceding work of any contractor but it will be in their interest to complete this badly designed work, wait for a client inspection, and then be instructed to undertake re-work, to be paid at day rates. Here the contractor is paid for the original work at the rate set in the tender bid, and then receives additional payment at day rates for the additional work. This explains the action of

contractor C.a. (as described by the site manager) in their contract to line a structure with thick plating. The staff were aware that the lining of an adjacent structure completed by another contractor was inadequate. A correction immediately upon this discovery would not have been costly in terms of money or time to the client. However, the contractor staff did not inform the client of this fault immediately. As work around the area continued a correction no longer constituted a simple matter which the client could expect to reimburse pro rata. At the stage where re-work would inevitably attract day rates, and when re-work was both time-consuming and likely to cause delays in access to other contractors, the contractor notified the client of the problem and offered to undertake the re-work at a 'times and materials rate plus 12.5%'. The client had little option but to accept. To attempt to force the original contractor to re-do the work would have been problematic, with the process of apportioning blame being time-consuming, and with the client lacking the ability to tolerate further delays in the area.

The same process was at play in the example given by the manager at contractor C.i.. In the process of completing work on their general mechanical engineering contract the contractor staff became aware that a significant element in the design was inadequate. Rather than informing the client of the problem, the approach was that it was 'best to leave things go without questioning'; there was a deliberate decision :- 'we'll let it run and get the changes when necessary'. At the point of the interview taking place the contractor had not yet informed the

client of the problem in the design, and so the outcome of the process was unknown, but the contractor believed that the re-work would be undertaken on day rates. A similar process was outlined by the industrial relations officer of contractor A.d.. He stated that of the work undertaken on site, which was nearly complete, approximately 15% had been done on day rates. Upon being asked whether the firm had in effect helped to create some of this work for itself, the interviewee replied 'let's put it this way, a lot of it might not have existed if we'd been completely honest'.

A clear conclusion from this is that the diverging interests of client and contractor manifest themselves in practices which directly serve to delay construction, and which therefore directly serve to harm performance against construction schedule.

Therefore, in stark contrast to the neo-classical theory of efficiency through competition, it is apparent that it is those contractors who are most adept at exploiting the opportunities for extras, rather than those who are most efficient in their production organisation, who will reap the highest profits. This is the context in which the boast of contractor C.i. that 'our backroom boys are exploiting every avenue' acquires real meaning and relevance. Moreover, often a client will be unaware that a contractor has deliberately contributed to the creation of extras. This will mean that the tactics of creating extras at day rates will not necessarily impair the contractor's chance of

being re-hired by the client on a later project. At this level it can be seen that under the appropriate circumstances a systematic reproduction of inefficient practices will occur, leading directly to chronic problems concerning performance against schedule.

'Underbidding'

Underbidding occurs when the contractor quotes a price for a piece of work put out to tender which is lower than one which would cover its costs. The rationale is that the firm is desperate for work and is willing to gamble on the opportunity that once the job is won there will be possibilities to increase the payments from the client.

A rare piece of primary, documentary evidence concerns underbidding. The Director of a major contractor wrote to the NJC Director in 1988 concerning the 1981 national agreement's effect on economic performance. The letter argues that the 1981 national agreement could only have a limited impact because it cannot directly affect capital relations which are the key determinants of performance :-

'On many large projects the nature of the contract between client and contractor creates problems which are insoluble in terms of the agreement, e.g. lump sum contracts which are entered into at cost or below cost with the managing contractor happy to recoup losses by means of extras, this demands unrealistic bids by

subcontractors who quite understandably are not prepared to consider any course of action unless it is specifically spelled out in the contract. This in turn leads to low productivity on site which becomes the norm.... this leads quite naturally to overrun on the project' (emphasis added).

Although evidence on underbidding from original research is more limited than for evidence concerning extras it is nonetheless informative. A senior management official for the client at project A stated that on one of the parts of the site where the client did not use a managing contractor, and hired contractors directly, it became obvious that one of the contractors had underbid. This firm sought to delay their work as long as possible in their attempt to look for avenues through which to extract more money from the client. In this instance the client added client staff as supervisors to the contractor's staff, seeking to impose more direct control. A delay was expected on the completion of the contract. The site manager of contractor C.g. reported that on the previous (named) project on which he had been working, the firm had underbid, and had been unable to exploit any avenue for significant additional payments. The firm ultimately went 'cap in hand' to the client seeking an increase in payment. The client conceded 'a small increase'. It is appropriate to place contractor B.c. in a discussion of underbidding. The site manager commented that the productivity levels on their tender had been 'deliberately optimistic' in the belief that 'we'll have claims'. This belief, however, had yet

to be justified. The contract was a fixed price one for fabricate and construct. Severe problems had arisen with delivery of materials from the contractor's manufacturing base. The blame for the delay in construction work could not be apportioned to another party, and the contractor felt compelled to substantially increase the labour force to increase the construction pace even though the marginal productivity of additional work was low due to an inadequate supply of materials to provide a continuous flow of work. The manager stated that if the materials problem had not been so clearly the fault of his firm he would have 'sat on the job' and waited for a direct instruction from the client to accelerate. A more indirect piece of evidence on underbidding was the comment by the client project manager at project C that the cancellation of future orders for similar plants 'made hitting the project schedule more difficult' because a number of contractors had put in very low bids in the hope of securing work for future projects.

This evidence indicates important consequences of the practice of underbidding, all of which harm performance against schedule. The contractor who underbids will be firmly committed to gain extra payments from the client in some manner. The various methods of achieving extras were outlined earlier and were shown to impair economic performance. Alternatively, the underbidding contractor could seek to gain additional payments by forcing the client to issue 'instructions to accelerate' through 'sitting on the job'. The meaning of these terms and their wider relevance will be outlined below, suffice to say here that they harm

economic performance. The other potential option for the underbidding contractor is to go 'cap in hand', i.e. to ask directly for an increase in payment. In this last option the contractor is in the weakest position, and because of this it is likely that the contractor will attempt the other two options before resorting to the third. The third is still a viable option often to contractors because they are aware that it would be extremely costly and time-consuming for the client to attempt to bring in another contractor to replace the original one. Whilst this last option does not directly impact on economic performance it should be seen as occurring at the end of a process which does have potentially significant negative implications for project performance.

Another implication of underbidding concerns its likely impact on the resourcing and structure of the contractor site management team. The point was made above that there is a clear incentive for contractors to structure their site management team in terms of favouring the jobs which seek to exploit the opportunities for extras, rather than those concerning planning and increasing the efficient organisation of production. For the contractor who has underbid this argument becomes much stronger - such a management structure is no longer determined by incentive, but rather by necessity.

A discussion of underbidding and its consequences needs to be informed by an understanding of whether it should be seen as an occasional aberration, or whether it should be seen as

systematically recurring. It is necessary to consider the environment which prompts the contractor to consider the option of underbidding. Underbidding becomes an option when nationally the firm is short of work or has a cashflow problem. If the structure of capital in the industry is such that there is a relatively high turnover of competing firms then it can be seen that underbidding becomes endemic to the industry. There will be a high turnover of firms where there is a low threshold of capital for entry into the industry, i.e. where the industry is characterised by a large number of small firms. The ECI is just such an industry. Supporting evidence for this assertion on the structure of the industry will be given in the following chapter.

It is also necessary to consider the environment which relates to the likelihood of success of this strategy of underbidding. Success depends on the client accepting the bid and the contractors being able to extract sufficient additional payments from the client to make a profit on the job. Relevant considerations here are whether the client has a long term projection of investment in the country; whether the client has developed long term relationships with contractors; and issues concerning the level of control the client has over the contractor.

This discussion has highlighted the negative impact of underbidding on project performance and has argued that under certain circumstances underbidding can become a significant and chronic characteristic of capital relations in the industry.

'Sitting on the job'

The practice of 'sitting on the job' was referred to in the above discussion of the consequences of underbidding, but it has a wider relevance than that. The term refers to the practice of a contractor deliberately working more slowly than the client wishes. The point of this is to force the client or managing contractor to issue explicit instructions to accelerate the work programme, instructions which will subsequently form the basis of claims for extra payments.

Contractor A.b. was a managing contractor on one of the sub-projects on the site. The contract with the client was to design and construct a plant, with payment by a fixed price - a turnkey contract. At the time of the interview the project was 'considerably behind schedule'. The industrial relations officer of the managing contractor stated that the delay was 'largely due to problems with design of the plant'. In particular, he argued that the root of the problem was the poor definition of the process of the plant by the client. The managing contractor argued with the client that the contract should have been turned into a reimbursable one, but so far the client 'has stood his ground'. This same managing contractor had two sub-contractors who were 'sitting on the job'. The sub-contractors had bid fixed price on the basis of only limited design information. With the delay caused in the design stage, the managing contractor required an acceleration in the construction phase to compensate

for this. However, the sub-contractors had no incentive to accelerate their work programme without additional payments, and were therefore refusing to commit extra resources, in terms of management, labour and plant, to the site without a guarantee of extra payment. The problems, however, were such that the managing contractor could not afford to offer to make such payments. The interviewee characterised this situation as 'problems compounding themselves' with the original delay which lay at the design stage being compounded by the sub-contractors sitting on the job. Although the outcome of the situation had not yet become clear the interviewee indicated that the sub-contractors' tactics were likely to be at least partially successful when he stated that whether a profit was to be made on the project depended on 'our claim with (client A) and on how much we have to pay the sub-contractors for acceleration'.

Contractor C.h. had a fixed price contract with the client. Their access to the work site had been delayed due to the late working of previous contractors, but the client had stated that the contractor was still expected to be finished by the original date in the contract. The site manager at contractor C.h. stated that he had considered adopting the tactic of 'sitting on the job' in order to force a specific instruction from the client to accelerate, an instruction which would be the basis of a claim against the client. Ultimately, the site manager stated that he rejected this option because there were likely to be a large number of opportunities to claim extras on the contract through the processes described above under 'extras/on day rates'.

The industrial relations officer of client B gave relevant evidence concerning a (named) contractor on a recent (named) project. He stated that if a contractor bids for job X but ultimately is asked to perform job Y then in the process of this the contractor is likely to become a 'problematic contractor'. He gave a specific example to substantiate this. He stated that the particular contractor had inadequately understood the complexities of the job for which they had bid, and found themselves unable to make adequate headway with the work with their existing site resources. There were some late design changes which affected the precise definition of their allocated work in a 'not particularly significant' manner. The contractor seized this opportunity to attempt to extract extra payments and sought to pressurise the client by 'basically sitting on the problem for three months'. Ultimately, the client was forced to concede some extra payments and the delay contributed materially to the overall project overrun.

The experience of contractor B.c. was outlined in the discussion of underbidding. The contract was experiencing considerable delay because of problems with supply of materials. The site manager stated that had the problems not been so clearly the fault of his own firm he would have 'sat on the job', and waited for a direct instruction to accelerate. As it was, he had been obliged to bring in extra labour to attempt to compensate for the delays.

The project manager of a scaffolding firm (no code given for

reasons of confidentiality) stated that the contract on the project was a 'very tight' fixed price one. In the likelihood that the profit return would not be adequate based on the existing terms he anticipated deliberately 'slowing down the work'. He stated that it was unusual for scaffolding to be undertaken on a fixed price contract, and that this placed the risk on the subcontractor. However, for this to work smoothly it required excellent advance planning by the client/managing contractor, such that if the contractor was to be able to maintain an adequate and stable workforce he required four weeks advance notice of the workload required. At the time of the interview the project was at an early stage but the manager believed that such a level of planning was unlikely to be achieved. The contractor would then be in a position of deliberately 'slowing down the work', being able to blame this on inadequate planning from the client/managing contractor, and then being issued with an instruction to accelerate, which would constitute the basis of a claim for additional payments.

Clearly, the practice of sitting on the job has a direct negative impact on performance against schedule. Here it should also be borne in mind that it takes time before the client realises that the contractor is deliberately sitting on the job - indeed contractors will never freely admit to a client that they are deliberately delaying a job. The true nature of the situation only becomes apparent after a period of time, during which progress is held up. Even once the situation has been diagnosed by the client or managing contractor further time will elapse

before the work is accelerated.

It is necessary to address the question of how far sitting on the job can be regarded as endemic and structural, or as an aberration. Given that the practice is often associated with underbidding, and given that underbidding was seen as being systematically reproduced under the appropriate circumstances, it is logical to argue that sitting on the job should be regarded in the same way.

'Commercial Bias scenario/Withholding Information'

These two practices often go together, but it will be seen that withholding information has a wider applicability. The term 'commercial bias scenario' mainly applies to situations involving managing contractors. The precise meaning of the terms is best understood through examining the interview evidence.

The site manager of contractor C.e. gave relevant evidence concerning the firm's experience on a recent (named) project. He stated that it was important to differentiate a project under a client (i.e. project C) from one under a managing contractor. At the recent project the managing contractor was experiencing problems at the design and procurement stages. The managing contractor did not inform the client that problems had occurred, problems which were the fault of the managing contractor. Rather, the managing contractor sought to mitigate the effects

of delays at earlier stages on the overall project schedule by seeking an acceleration of the construction phase. The interviewee stated that with the managing contractor not highlighting the true source of the problem to the client, the job developed a 'commercial bias', with relationships becoming 'very contractual in nature'. The managing contractor, working within a fixed price contract, sought to 'minimise on the subcontractors'. The managing contractor sought to 'pressurise' the interviewee's firm and others into building up the labour force in order to accelerate the construction programme. At first this pressure was applied informally, but was later manifest by the managing contractor claiming that the precise form of words within the contractual document which the subcontractor had signed obliged the firm to accede to demands to accelerate the programme. The interviewee's firm contested the managing contractor's interpretation of the words in the contract. This is what is meant by a relationship becoming more 'contractual in nature'. The interviewee further said that whilst this 'contractual squabbling' was going on the managing contractor was able to go to the client and argue that any problems that were occurring were due to uncooperative contractors - a claim which could form the basis for a subsequent request for additional payments from the client to the managing contractor. Crucially, the terms of the contractual relationship between the client and the managing contractor were such that the client was unable to directly communicate with the subcontractors, and therefore the client remained ignorant of the true cause of the initial delays. The outcome of the

'contractual squabbling' between the managing contractor and the interviewee's firm was that the firm agreed to a 'partial acceleration', with a 'slight re-negotiation of terms'. The interviewee was unaware if the managing contractor was able to extract any additional payment from the client.

The industrial relations officer at contractor A.a. stated that on the present job the development of a 'commercial bias scenario' had only been narrowly avoided. The firm A.a was a main contractor to a managing contractor on the site who had a turnkey contract with the client. There were severe delays in the design stage of the project, and the managing contractor sought to hide their own problems by pressuring the contractor to accelerate. The contractor initially responded by putting forward their interpretation of the contract such that additional payments would be required if extra resourcing took place. These were the preliminary stages of a commercial bias entering into the relationship. The full scenario was avoided by a national directorial-level meeting between the firms in which it was decided to 'split the dividends'. This was possible because the contract was 'very lucrative'. The project overran by three months but the managing contractor and the main contractor still reaped a profit.

The situation of managing contractor A.b., which was outlined in the discussion of sitting on the job, can be legitimately conceptualised as involving a commercial bias scenario, although the interviewee did not use the precise term. The managing

contractor had a turnkey contract with the client. The contract was subject to considerable delay due to problems in the design stage (the managing contractor was arguing that the problem lay in the stage of process definition, the client's responsibility). Because of this the managing contractor required an acceleration of the construction phase, but had so far been met by two contractors sitting on the job. At the time of the interview the managing contractor was involved in the process of arguing with the obdurate contractors that they were contractually obligated to accelerate.

The project manager of the client at project A stated that real drawbacks existed in the use of managing contractors, and that the decision to use them on some sub-projects had been necessitated by the very high peak load of construction which the client did not have sufficient design and management resources to cover. The drawbacks which the projects manager had experienced were the problems of 'managing contractors not divulging information, and trying to hide their mistakes'. He stated that this had occurred with two (named) managing contractors - managing contractor A.b. and the managing contractor of contractor A.a, both of whom have been referred to above.

The industrial relations officer of the client at site B gave relevant evidence concerning his experience at a recent (named) project. He stated that at the project the managing contractor had been awarded a turnkey contract. There had been severe

problems and delays in the design stage, but the managing contractor had attempted to shift the blame for the problems onto the subcontractors. The client was unable to directly communicate with the subcontractors, and the managing contractor used this situation to attempt to draw money from the client. The key focus of the managing contractor was on seeking to extract additional payments rather than on attempting to solve the severe design problems. The interviewee stated that 'the last thing the managing contractor will say is the truth - that we are the cause of the problem'.

In all of the above the practice of withholding information occurs in the context of a commercial bias scenario, but it has a wider relevance than this. The site manager of contractor B.c. stated the firm had a fixed price fabricate and construct contract with the client. The contractor was experiencing 'horrendous problems' of delivery of items from another manufacturing division within the firm. The site manager had sought to hide the problems from the client, but the problems had become so manifest and were so obviously the fault of the firm that upon persistent questioning by the client the contractor admitted the nature of the problem. In connection with this, the industrial relations officer of the client at project B stated that contractor B.c.'s job had been subject to delay, and that 'we got them to admit' that the problem lay in the supply of fabricated items from their manufacturing base. Upon further enquiry into the form of this problem the client concluded that there was unlikely to be a significant improvement in the

delivery of items in the near future, and the client therefore forced contractor B.c. to give part of the fabrication element of their contract to another firm.

So far the evidence presented on the commercial bias scenario might suggest that it only applies in situations involving managing contractors. However, similar, though less extreme, processes of withholding information and attempting to pass on blame can exist in the context of client/main contractor/subcontractor relations, where the main contractor could attempt to shift the blame for its own mistakes on to the subcontractors. The interview with the manager at contractor A.c. provided evidence of a contractor withholding information from the client. The official stated that 'we are running about six weeks late because of modifications and design changes, and also because of some poor working by us'. On being asked how he explained the delay to the client, he stated 'I say it's completely down to their incompetent design'. Also relevant is a rare case of historical documents providing direct information on the practices of contractors. The minutes of a meeting in 1971 at the BP site, Baglan Bay, between BP Chemicals staff and a contractor committee set up (at the behest of BP) to examine low productivity state that 'BP Chemicals say contractors are far too optimistic when giving dates for plant availability and only at the last hour will admit failure'. This 'optimism' can be legitimately interpreted as a deliberate withholding of information concerning directly attributable problems created by contractors.

It is necessary to clarify why the client is constrained from communicating with the subcontractor. In a turnkey contract with a managing contractor the client is aware that interference of any kind whatsoever within the area specified in the contract to be the sole responsibility of the managing contractor will constitute a 'legitimate' basis for a claim against the client by the managing contractor. As such, the terms of the contract between client and managing contractor can be seen to constitute a boundary over which the client is not allowed to step without penalty. The very strict and defined nature of this boundary is manifest in that the mere occurrence of direct communication between the client and the contractor in order to exchange information would constitute a breach. Where there is no managing contractor the nature of the boundary separating the client from a main contractor's subcontractor is less defined.

From the above discussion it is clear that the practices related to the commercial bias scenario and to the withholding of information have a negative impact on performance against schedule. There are a number of differing mechanisms through which this impact is transmitted. Firstly, the process of a commercial scenario creates an environment in which the likelihood of contractors sitting on the job becomes greater. The development of relationships which are 'contractual in nature' leads to a delay in all decision-making in that discussions become increasingly based on quasi-legalistic interpretations of forms of words. This feeds into another aspect of the negative impact on performance - namely that the

priority of the management of the managing contractor and the contractor becomes not making the organisation of production more efficient, even of aiming to complete their work by the agreed date, but rather the practices of attempting to assign blame to another party, and of seeking interpretations of particular terms in documents and contracts which are favourable to them. In considering all of these mechanisms it should also be borne in mind that the playing out of these tactical practices all takes time. The systematic manipulation and withholding of information is an intrinsic element in this whole process, and so because the process can be said to be furtively created time necessarily elapses before the parties are aware of what is occurring, and before a possible solution can be reached.

The question now arises how far practices related to the commercial bias scenario and to the withholding of information can be seen as systematically recurring. The practice associated with the commercial bias scenario occur primarily in situations involving a managing contractor. Therefore, any attempt to argue that it systematically recurred in a particular time period must take into account how widespread managing contractors were. In periods where there are managing contractors it is clear that the process will keep playing itself out on projects where major problems occur in the design stage. Furthermore, in relation to the withholding of information it is clear that there are structural incentives for contractors to attempt to pass on the blame to other parties. Here, the words of the client interviewee at site B bear repeating :-'the last thing the

managing contractor will say is the truth - that we are the cause of the problem'. This point has a wider applicability than to just managing contractors.

Evaluation of primary data

The above sub-sections presented evidence based on contemporary original research on a number of common practices which are important to understand in examining capital relations and their impact on performance against schedule. In each of the individual discussions of extras/on day rates, underbidding, sitting on the job, and commercial bias scenario/withholding information, it was noted that there was convincing evidence that such widespread practices had a negative impact on performance against schedule. It was also noted that in each case there were strong reasons for rejecting the idea that such practices could be regarded as aberrant. Rather it was argued that these practices could be seen as recurring systematically. In a number of instances the important qualifying clause 'in the appropriate circumstances' was an integral part of this argument.

While each of the individual discussions provides valuable evidence linking capital relations and economic performance, taken together to form a whole the discussions constitute a strong body of systematic evidence on the nature of client-contractor, and inter-contractor relations, and on the negative impact of these relations on performance against schedule. The

evidence on the nature of these relations and the practices to which they give birth paints a very clear picture of clients and contractors meshed in a system of conflictual, short-term, low trust relations, a system in which the focus of profit-making becomes the ability to exploit opportunities to generate extra payments rather than the ability to organise production more efficiently.

5.5. Inference Across Time?

As noted earlier, the use of research on contemporary events in analysing the 1960s and 1970s needs to be justified. In the analysis of contemporary evidence it was argued that the practices could be seen as systematically recurring in the appropriate circumstances. It is logical, therefore, to argue that if the relevant environmental factors in the 1960s and 1970s correspond to these 'appropriate circumstances' then the case for inference across time has been made.

As such, the focus of this section is upon these environmental factors. Because much that is relevant here pre-figures the following chapter's discussion of the role of capital relations in the improvement in project performance in the 1980s this section will serve only to present outline rather than detailed points, leaving greater detail for the following chapter.

In relation to extras and day rates it was argued that there

would be a systematic reproduction of these inefficient practices. However, these practices will also vary according to the timing and quality of design in particular, in that it is often faults in the design which are deliberately ignored by the contractor, or late changes in the design, which allow contractors the opportunity to claim extras on day rates, thus perpetuating the system of profit-making which is not dependent on the efficient organisation of production. The important point here is that there has been a significant improvement in the control of the timing and quality of design in the 1980s. This improvement has taken place largely due to the growth of managing contracting and its success in better controlling the discipline of design, and due to the development of Computer Aided Design technology. What is relevant for this discussion is that the fact that the timing and quality of design were significantly worse in the 1960s and 1970s serves to strengthen the argument that it is appropriate to generalise from contemporary evidence to the 1960s and 1970s without fear of overstating the existence of contractor behaviour harmful to economic performance.

In relation to underbidding it was argued that this practice would systematically recur where there was likelihood of extras, where there was a large number of small firms, where there were short term relationships between client and contractor, and where the level of control over the contractor was low. The above paragraph argued that the likelihood of extras was higher in the 1960s and the 1970s. In terms of the structure of capital in the industry, it largely remained in the 1980s what it was in the

1960s and the 1970s - namely, an industry of a large number of small firms, and a small number of large firms. In relation to short term relationships between contractors and clients this has been a chronic feature of the industry throughout the thirty years covered by this thesis. This is manifest in the manner in which the NEDO (1991) report on partnering in the USA points out what a radical departure this form of long term relationship would be for the UK industry. In relation to the last factor, the level of control by the client over the contractor has increased markedly in the 1980s compared to the 1960s and 1970s. A good proxy for this shift is the move from reimbursable contracts in the 1960s and 1970s to fixed price contracts in the 1980s. The prevalence of reimbursable contracts in the 1970s and their significance in terms of control is highlighted by the evidence given by John Baldwin, General Secretary of the AEU-CS, to the 1981 House of Commons Select Committee on Energy :-

'I see the reimbursable contract being the main thing in this country.... there is evidence that some of the major contractors in the United Kingdom now would not be interested in bidding for a large contract unless it was on a reimbursable basis.... I do not really see.... any real evidence that we have control of the purse strings so far as reimbursable contracts are concerned' (para 1924).

In sum, consideration of the environmental factors support the thesis that it is appropriate to infer across time.

The earlier discussion of sitting on the job indicated that the

factors determining how far it could be said to systematically recur were essentially similar to those factors discussed in relation to underbidding. As such, the conclusion of the above paragraph holds true for sitting on the job as well.

The discussion of commercial bias scenario and withholding information argued that the widespread existence of managing contracting would be a sufficient condition for their recurrence. Managing contracting began in the early 1970s and became widespread in the non-power station sectors by the mid/late-1970s. The incentive for contractors to withhold information as part of a system of passing on blame to other parties can be seen to be present throughout the 30 year period being studied. Therefore, with the minor proviso that managing contracting did not exist in the 1960s, it is once again appropriate to argue that inference can be legitimately made across time.

In each of the individual discussions it has been found that it is legitimate to infer from evidence on contemporary relations and practices of capital to relations and practices in the 1960s and 1970s. More generally, given that the contemporary evidence painted a vivid picture of clients and contractors meshed in a system of conflictual, short term, low trust relations, any other evidence which points to such a nature of relations will serve to strengthen the argument that it is appropriate to infer across time. Such secondary evidence that pertains directly to the 1960s and 1970s is considered in the following section.

5.6. Evidence on Practices - Secondary Sources

In considering evidence from secondary sources it is important to be aware of the underlying model of political economy being put forward by the authors. In particular, given that it has been argued that an understanding of the diverging interests of the client and the contractor is a fundamental building block for an analysis of capital relations and economic performance it is clear that those accounts of practices which do not portray this understanding will be of limited value. The secondary sources examined are Kharbanda and Stallworthy (1983), an internal unpublished NEDO report, a 1986 NEDO report on the BP Sullom Voe project, and the 1976 NEDO report.

The title of Kharbanda and Stallworthy's (1983) book, How To Learn From Project Disasters, informs the reader immediately that the authors approach the issue entirely from a managerial concern to improve project management. Chapter 6 of their book concerns the building of an oil refinery, the Conoco refinery, in Humberside in 1967-70, a project which was subject to substantial schedule and cost overruns. The chapter includes valuable information concerning the relationship between the client and the managing contractor. Conoco, an American client with no experience of the UK ECI, insisted that the refinery be built by a managing contractor on a design and build basis, to a fixed-price contract. Under the tendering system Davy were appointed managing contractors. The authors argue that Davy deliberately underbid in order to be able to expand their operations into the

construction of oil refineries. They explain the occurrence of the schedule and cost overruns in terms of two key factors - the lack of discipline in not having a frozen design, and the labour situation in which there were no established procedures for paying for work against effort. They argue that problems multiplied through the client demanding numerous design changes, and through Davy failing to reveal to the client the escalating nature of the problems.

The point to note is once again the central importance ascribed to capital relations. Here is concrete and specific evidence connecting capital relations and project overrun. Although the chapter adopts a descriptive rather than analytical approach there is enough information to give indications of the mechanisms through which this connection occurs - evidence of underbidding, of the lack of discipline on design, and of the deliberate withholding of information by the contractor are all present.

The next piece of evidence on practices to be considered is an internal unpublished NEDO report on a named project. The NEDO group comprised a trade union official, two client officials, and a NEDO staff member. The project was an oil refinery built between 1978 and 1982; it had a planned construction schedule of 28 months, and an actual one of 53 months. The project design and build contract was let by the USA client to a managing contractor on a reimbursable basis. After providing a detailed descriptive account of capital relations and labour relations of

the project, the report concludes that there were three key reasons for the massive overrun. Firstly, it was considered that the original schedule was grossly unrealistic, This meant that the whole basis of planning was flawed, contractors were forced to start up too early on site, and the inevitable re-negotiation of contracts served to sour relations. Although the report does not explicitly state that the managing contractor underbid this does not appear unlikely given that it was the managing contractor's first major project in the UK, and given that their tender bid quoted a project length a full 6 months shorter than their nearest competitor's. Secondly, the management performance by the client was seen as being 'inappropriate', particularly in relation to choosing the lowest and shortest bid, and in relation to not committing enough resources to monitor and improve the work of the managing contractor. Lastly, the report blames the managing contractor's inexperience of the UK ECI :- 'much advice was ignored about the management of sub-contractors in the U.K., about the need to support their planning, about the risks of poor supervision, about the sort of field co-ordination the managing contractor should provide, about likely supply problems'; the managing contractor was 'unaware of the chronic tendency of contractors to 'buy the job' and therefore accepted unreasonably low bids. The inevitable consequence was that the sub-contractors were looking for opportunities to re-negotiate and in the meantime were minimising their own risk'. This analysis clearly supports of the arguments developed in the discussion of the primary evidence.

Given the report's unequivocal analysis that the form of capital relations lay at the heart of the reason for the large overrun it is hardly surprising that it remained an internal document, and was not considered for publication. It is, however, the most penetrating and insightful of the various NEDO studies, being uniquely characterised by an approach which does not in effect pre-judge the issue by focusing primarily on labour issues, and which also critically examines managerial interpretations and definitions.

The published 1986 NEDO study of the BP oil storage and refinery facilities project at Sullom Voe, however, cannot be ~~exonerated~~ from the latter criticism in that it relies heavily on a paper written by Carr and Williamson (1982) who were both part of the client management team for the project. The project which was built between 1975 and 1982 was subject to a construction schedule delay of 25 months. Whilst political problems involving planning permission from the council caused significant delays, both the NEDO report and Carr and Williamson's paper stress that an incomplete design lay at the heart of the delay, in particular in that it necessitated the placing of reimbursable, rather than fixed price, contracts - 'an attempt was made to provide an incentive element to these contracts by the award of a fee for satisfactory performance against work norms. However, BP have stated that this was not successful in inducing greater productivity. They believe that better productivity was achieved on the fully measured contracts' (NEDO, 1986:18). Further, the early problems 'lead to the usual sequence of hiccups, late

design leading to late ordering and deliveries, inappropriate start to construction etc. which had become a familiar feature in the management of large capital projects' (NEDO, 1986:31). Here once again a study of an individual project subject to substantial delays reveals that issues which can be conceptualised as pertaining to the relations of capital are seen as the central determinants of construction schedule overrun.

The final piece of secondary evidence on practices to be considered is the 1976 NEDO report. The NEDO group consisted of 2 national union officials, 3 client officials, 4 contractor officials and was chaired by the chairman of ACAS. This report was quoted by the press at the time, and by subsequent public bodies to the effect that the key cause of delays in projects was the state of industrial relations. However, it is clear that the importance of industrial relations' problems is inferred rather than demonstrated within the report. This stress on industrial relations can be related to the fact that within the working group who authored the report there were a number of individuals who were persistent advocates of reform of the collective bargaining arrangements.

Despite the lumping of problems in the residual category of industrial relations, the report does contain relevant evidence pertaining to capital relations. The report examines 7 UK projects, 5 of which overran their schedule substantially. Severe design problems are mentioned in relation to 3 of these projects. Also, the report notes that design and construction

problems may be 'inter-related' (p.64), but there is no attempt to understand the nature of this inter-relation, and whether it is systematic in nature. This is inevitable given that the report lacks the conceptual tools to develop an analytical understanding.

The evidence on the persistence design problems is very relevant in that design problems allow contractors opportunities to claim extra payments. At this point it is also possible to begin to understand the persistence of the problems in the 1960s and 1970s concerning the late delivery of materials and plant to site as emphasised in the 1970 NEDO survey of contractors as well as in the 1976 report. Such problems can be seen not only as a consequence of late design information,, but also as a consequence of the emphasis of contractors upon generating additional payments rather than increasing the efficiency of production. This point becomes clear if the situation of a contractor with a fabricate and construct contract is considered. Given that the construction site management know that there is a strong likelihood of being able to generate additional payments from the client beyond the original tender price, they will be less likely to seek to exert pressure on the manufacturing division of their firm to ensure correct and timely delivery of materials. In the context of spiralling and reinforcing problems on large construction sites in the 1960s and 1970s opportunities would always exist for the contractor to be able to deflect blame for delays on to another party. Similarly, given that the senior corporate management of the firm are aware that the construction

site management can be relied upon to generate profit through reaping additional payments beyond the original tender price, they will be less likely to grant priority to manufacturing and delivery items to the construction site team.

Two additional relevant pieces of information are contained in the 1976 report. The first is that in the 1970s reimbursable contracts were in widespread use. On the ethylene plant the client would have preferred a fixed price form of contract but 'under the circumstances it was not realistic to consider anything other than reimbursable contracts. A few subcontractors who were employed on a schedule of rate basis found themselves governed by the slow tempo of the job and their position untenable. As a result these contracts were subsequently replaced by reimbursable contracts' (p.34). On the distillers plant the form of contract for the construction contractors was 'total cost plus percentage for field labour', which is in effect a variant on the reimbursable contract theme. On the first refinery plant the construction contracts were reimbursable, although 'the client would have preferred a wholly lump sum contract but could not find a contractor who was prepared to bid on that basis' (p.59). The second refinery plant's main contract was wholly reimbursable, while the main contractor subcontracted sitework on a lump sum basis. On the methanol plant the contracts were let 'on a schedule of rates basis' (p.67). The report fails to give any information concerning the form of contract on the two power stations, but from the Monopolies and Mergers Commission report (1981) and the House of Commons Select Committee report

(1981) it is clear that from 1970 to 1978 the CEGB had a policy of letting contracts on a reimbursable basis.

The point here is that the existence of reimbursable contracts in this period further strengthened the nature of the system in which the focus of profit-making for contractors was not the efficient organisation of production. The report notes that the client of the ethylene plant 'claimed that the subcontractors on reimbursable arrangements lacked incentive to achieve good performance' (p.34). In addition, the report notes that the client of the first refinery would have preferred a lump sum contract. Also relevant here is the comment in the 1986 NEDO report concerning the 1975-82 Sullom Voe project :- 'BP have stated that this [reimbursable contracts] was not successful in inducing greater productivity. They believe that better productivity was achieved on the fully measured contracts' (p.18). The Monopolies and Mergers Commission noted in relation to the CEGB sites that due to reimbursable contracts 'self-discipline of contractors in matters of efficiency tended to be undermined' (p.264). This can be seen as supportive of the thrust of the argument of this section.

Therefore, there is logical clarity and strong evidence to support the argument that in the 1970s in the context of a system of low trust, conflictual, short term capital relations the existence of reimbursable contracts served to strengthen the mechanisms through which capital relations served to negatively impact on performance against schedule.

The final relevant piece of information in the 1976 report is the observation that delays on projects were rarely made up, and in fact tended to compound themselves (p.10). This was only true for the UK projects. The report offers no explanation for this. However, the primary evidence gathered in on-site interviews makes an understanding of this possible. It will be recalled that a common practice of contractors to generate additional payments is to sit on the job in order to force an explicit instruction to accelerate, an instruction which will form the basis of a claim for extra payments. To be undertaken successfully, sitting on the job requires that the contractor is able to justify their failure to meet the construction schedule on the actions of another party. In a situation of already existing delays, due to design problems and/or the actions of other contractors, the condition for the successful execution of sitting on the job is effectively satisfied. Clearly, in this context it is likely that a situation will arise in which one delay begets another as contractors seize the opportunities to generate additional payments though sitting on the job. So the cycle of compounding delays is created. This lies at the heart of an explanation of the 1976 report observation that delays were rarely made up on UK projects and tended to compound themselves on UK projects (see also chapter 7's discussion of shiftwork).

5.7. Conclusion

The introduction to this chapter stated that the aim was to

integrate evidence and analysis in addressing the question of the role of capital relations and structure in the poor performance against schedule of the 1960s and 1970s. It has done this by firstly examining attitude-based evidence. This was taken from both published and unpublished sources, and it strongly suggested that capital relations and structure played a key role in poor performance against schedule. Next, the chapter examined the evidence concerning the material practices, arguing that this form of evidence should be preferred. Firstly, primary data were considered, and this provided strong evidence directly linking contractors' practices with poor project performance through a discussion of extras/on day rates, sitting on the job, underbidding, and commercial bias scenario/withholding information. It was argued that it could be inferred that in the environment of the 1960s and 1970s a system existed in which the focus of profit-making for contractors was not the efficient organisation of production but the ability to exploit the opportunities to generate extra payments. This system reproduced poor performance against schedule.

Next, evidence on practices from secondary sources was considered. Published and unpublished sources were examined, and it was argued that the sources which acknowledged the diverging interests of client and contractor should be preferred. A consideration of these secondary sources in light of the insights gained from the primary data served to strengthen the emerging picture of clients and contractors meshed in a system of low trust, conflictual, short term relations.

The reader will note that many of the practices of contractors outlined in this chapter accord with the expectations raised by Williamson's concepts of 'opportunism' in situations of 'information impactedness' where a post-tender situation of 'bilateral monopoly' exists. A fuller discussion of the relevance of Williamson's approach is, however, postponed until the following chapter.

With the central role of capital relations in the creation of poor project performance in the 1960s and 1970s established, it is the task of the following chapter to address the question of the role of capital in the improvement in project performance in the 1980s.

Notes

1. To preserve anonymity the contracting firms are not identified by their trading names. Rather, they are identified by a code comprising of two letters. The first (capital) letter refers to one of the four projects, whilst the second (lower case) refers to a particular firm on that project.

CHAPTER SIXCAPITAL AND ECONOMIC PERFORMANCE IN THE 1980s6.1. Introduction

Chapter 4 presented evidence on performance which showed a significant relative improvement from the 1970s to the 1980s but that in a number of projects in the 1980s actual construction continued to overrrun construction schedule. This chapter therefore seeks to address the role of capital-capital relations in this considerably improved, but not unproblematic, performance against schedule in the 1980s.

The primary evidence, used in the previous chapter, taken from contemporary on-site interviews, clearly established that capital-capital relations in the ECI can continue to be legitimately characterised as low trust and conflictual. As such, the basic nature of capital relations from the 1960s to the 1980s remains unchanged.

The key argument of this chapter is that although these low trust, conflictual relations persist, the opportunistic practices, outlined in chapter 5, which directly harm performance against schedule have been less widespread because of the rise of managing contractors and their successful reduction of

contractors' opportunistic practices through a strategy of passing on risk.

The improvement in economic performance has not come about because of any shift in the fundamental nature of capital relations.

Sections two to four of this chapter address the growth of managing contracting and explanations for this growth. Sections five to eight examine the implications of this growth for economic performance by examining the practice of passing on risk, the relationship between design and construction, the rise in subcontracting, and the changing form of contract. Section nine examines the facilitating contexts for the implementation of the managing contractors' approach. Section ten concerns the change in capital relations in the power station sector. The eleventh section addresses the question of whether there has been any significant increase in efficiency in the organisation of production in the 1980s.

Both primary and secondary data are used in this chapter.

6.2. The Growth of Managing Contractors

The Construction Industry Research and Information Association (CIRIA) defines management contracting as follows :-

'the term 'management contracting' covers the various

systems of project administration in which the common feature is that a client for a construction project enters into a contract with an external management organisation which then operates as the project's Management Contractor with responsibility for the management and co-ordination of the design and construction phases of a project' (1983:6).

Common to the number of differing forms of managing contracting is the organisational form which puts managing contractors in a position of monitoring the performance of contractors.

The key change in the structure and relations of capital in the 1980s compared to the 1960s has been the dramatic rise of managing contracting. Even in the late 1960s it barely existed in the UK - its exceptional status is clearly shown by the 1970 NEDO report in its discussion of the desirable numbers of direct contractors :- 'we believe that there is a case for the employment of the specialist 'engineer-constructor', i.e. the single managing contractor, on large sites. The employment of this type of contractor is common on nuclear and conventional power station construction abroad as well as on oil refinery and chemical projects' (p.20). The only managing contracting at the time were the consortia of large contractors which had been formed for nuclear power station construction.

The growth of managing contracting began in earnest in the 1970s. An indication of this growth is that of the five non-power

station projects examined in the 1976 NEDO report three involved a managing contractor. Further, Carr and Williamson (management staff of the client, BP), discussing the 1975-1982 Sullom Voe project, state (1982:245) :- 'we opted for what in 1975 was the fairly conventional approach of using one or more main contractors for design, procurement and construction management phases' (emphasis added). By the 1980s the rise of managing contractors was complete with only the electricity utilities and another major client building any major projects without the involvement of management contracting.

Further supporting evidence of the rise of managing contractors can be found in Ball's discussion of the wider construction industry in which it is argued that smaller firms seem to have changed their role within the industry, from being independent medium and small main contractors to being sub-contractors on projects run by large firms, and that 'to summarise the shift in the role of the building contractor, it is perhaps best to see the change as one of [large] contractors no longer being concerned with production management, which in its direct form is now often the prerogative of the sub-contractor, instead they are increasingly project managers' (1988:211).

6.3. Explanations for the Growth of Managing Contractors

Three potential reasons can be advanced for the initial growth of managing contractors in the 1970s - the general contracting-

out by corporations (i.e. clients) of their non-core activities; clients seeking to improve project performance by improving industrial relations; clients seeking to improve project performance by improving control of contractors. Evidence suggests that a combination of the latter two reasons provides the most plausible account.

Research involving both primary and secondary data provides no support for the first thesis. Indeed, there is evidence that serves to undermine it. In particular, Carr and Williamson (1982) in their discussion of the Sullom Voe project detail how BP hired two managing contractors, and yet still manned the project with the full complement of client managerial staff. Moreover, given that the recent contracting-out strategy of British capital did not become manifest until the 1980s (see Felstead, 1991:217), it is difficult to sustain, even at a logical level, the argument that clients in the mid-1970s sought to hire managing contractors in order to concentrate on their core activities.

The situation in the early and mid 1970s was that clients managing their own projects found that they were increasingly unable to complete projects to time or to budget. Around this time multinational contractors began to enter the British market offering managing contractor services. A large element of the growth of OCPCA membership in this period came through USA managing contractors establishing a base in the UK. The unpublished internal NEDO report on an oil refinery project begun

in 1977/78 notes that the managing contractor involved was European-based and that the project was its first job in the UK. Further support comes from Kharbanda and Stallworthy's (1983) account of the Conoco refinery in the late-1960s in which the British managing contractor involved deliberately underbid in order to expand its operations into the world market of oil refinery construction.

These multinational contractors offered clients the possibility of improving project performance by both better monitoring of contractors and improved industrial relations management. Indeed, these two methods were intimately linked. As chapters 7 and 8 spell out in detail, an adequate control of contractors implied the need for control of industrial relations in that shopfloor militancy was used by contractors as part of their strategy of evading client control and forcing additional payments from clients.

An integral part of the package which managing contractors offered clients was a claim to be able to improve industrial relations. The Director of the OCPCA, in interview, stated that the industrial relations expertise of managing contractors was a 'key selling point' for them. Indeed, the continued existence of two separate employers' organisations in the industry can be partly explained by this. The last serious merger attempt between the OCPCA and NECEA foundered upon the constituent members of the OCPCA (i.e. managing contractors) refusing to accept the NECEA condition that members should not meet with

union officials without an official of NECEA being present. Managing contractors objected to this condition because they saw it as undermining their individual expertise in large site industrial relations, an expertise which they regarded as one of their key selling points. Further, the intimacy of the link between the better monitoring of contractors and the improved industrial relations is the only way to understand the apparent contradiction of an employers' association (the OCPCA) negotiating terms and conditions of employment for workers none of whom they employ. Managing contractors in the 1980s do not, as a rule, directly employ labour.

The rise of managing contractors cannot be interpreted as a direct reaction to labour militancy. If schedule delays had been primarily caused by militancy and if the key reason that clients hired managing contractors had been to improve industrial relations, then, and only then, could the rise of managing contractors be seen as a reaction to militancy. However, neither of these conditions held. Labour did not push capital into the changes which were attendant with the rise of managing contractors, i.e. a curbing of opportunism.

The transaction costs approach appears to offer a framework to explain the rise of managing contractors. As noted in chapter 3 the central point of the approach is that economic organisations of capitalism can be understood as a process in which actors 'economise on bounded rationality while simultaneously safeguarding transactions against hazards of

opportunism' (Williamson, 1985:xiii). This means that more efficient modes of contracting emerge over time. Within this framework, the rise of managing contractors can be seen as explicable in terms of their role in minimising transaction costs by monitoring and curbing the opportunism of contractors which was described in chapter 5. At this level the Williamson framework is clearly applicable.

However, serious problems with the Williamson framework emerge once the question arises of analysing the form of managing contracting that emerged in the 1980s. It will be argued that managing contractors and clients faced alternative routes to improve performance. These are termed the low and high trust routes. In the UK the low trust route was followed. It will also be argued that improvements in economic performance in the 1980s have necessarily been limited because of this adoption of the low trust route.

The point at which Williamson comes closest to directly addressing issues of trust is in his discussion of 'atmosphere' (1975:37-9, Ch.4). It will be argued that the concept of atmosphere lies in contradiction to other assumptions in his framework. Next, it will be argued that, disabused of the concept of atmosphere, the Williamson framework in principle allows for the creation of high trust relations between firms but that the assumption of innate opportunism impedes analysis.

Williamson (1975:37) introduces the concept of 'atmosphere'

through a discussion of the study by Titmuss (1971) of blood donors. Titmuss compared the British system which relied entirely on voluntary donors, with the American system, a mixed voluntary-commercial effort, and concluded that the commercialisation of blood had had debilitating consequences. Williamson defends the Titmuss study against criticism :- 'an answer to the effect that the standard economists' model is correct and that altruism is unaffected by the creation of markets is glib and inaccurate' (emphasis added) (1975:38). This leads Williamson to argue that concern for atmosphere is important because 'supplying a satisfying exchange relation is.... part of the economic problem, broadly construed' (p.38). Note that in the development of the concept of atmosphere Williamson is implicitly accepting the existence of altruism and its importance in understanding behaviour. Altruism is defined in the Oxford English Dictionary as 'devotion to the welfare of others, regard for others, as a principle of action; opposed to egoism or selfishness' (emphasis added). Yet within the Williamson framework it is an assumption that opportunism is a fundamental trait of human behaviour; opportunism is defined as 'self-interest seeking with guile' (Williamson, Wachter and Harris, 1975:258). There is a clear contradiction. Opportunism, as a fundamental trait of human behaviour, and altruism cannot co-exist.

Whilst the concept of atmosphere is 'theoretically poorly articulated' (Willman, 1983:123), it is apparent that the concept of atmosphere allows for the possibility of altruism although it

does not necessarily denote its existence :- 'preferences for atmosphere may induce individuals to forego material gains for nonpecuniary satisfactions' (1975:39). 'Nonpecuniary satisfaction' can embrace altruism and therefore by extension the concept of atmosphere lies in contradiction to the assumption of opportunism. Reference to the 'nonpecuniary satisfaction' of individuals is a clear attempt to move away from assumptions of the economic human, and yet the assumption of opportunism posits the existence of the hyper-economic human.

Atmosphere is an artificial and contradictory addition to the Williamson framework. Disabused of this confusing notion it nevertheless remains possible in principle for actors defined by Williamson assumptions to create high trust relations. However, the weight of his assumptions make the creation of high trust relations almost impossible. Consider the case of the repeated Prisoners' Dilemma in which participation is voluntary. The learning process means that the participants' behaviour will be modified in light of the falling participation rate. The revision in behaviour of an individual is dependent on the realisation that cheating lowers participation, and on the belief that the individual's own behaviour materially affects the level of cheating and hence the level of participation. This is feasible. However, once the assumption is made that not only is the individual self-interested, but self-interested with guile, then the process of the modification of behaviour becomes more problematic. In particular an opportunistic actor will tend to want to be the last actor to modify his/her behaviour. If all

actors are opportunistic the learning process is drawn out.

The fragility of, and barriers against, high trust relations under the Williamson assumptions are highlighted by Casson's argument that :-

'this kind of trust is no more than enlightened self-interest.... The costs of engineering the right incentive structure can be very high. The incentives have to be foolproof, in the sense that no loopholes must be left which the self-interested individual can exploit.... To be sure that another self-interested individual can be trusted a large amount of information is needed, and a sophisticated model is required to predict that individual's most expedient strategy' (1991:16).

Further, there is evidence that high trust relations between firms do exist (e.g. see Sabel (1992), Zeitlin (1992)). This indicates that the Williamson assumption of innate opportunism is misplaced.

There are parallels between this criticism of Williamson and the criticism developed by Lazonick (1991). Lazonick argues that Williamson's is a theory of an 'adaptive' rather than an 'innovative' organisation (p.197), where the 'innovative strategy represents an attempt to confront economic uncertainty, the adaptive strategy an attempt to avoid it' (p.199). There are clear parallels between Lazonick's criticism that Williamson's

framework cannot address innovative organisation and the criticism developed here that the framework hinders analysis of trust relations. Williamson's framework can explain actors avoiding economic uncertainty, or in the specific case of the ECI, actors 'passing on risk', but it cannot address the possibility of confronting economic uncertainty, or in the specific case of the ECI, of sharing risk through the sharing of information and costs and the integration of design and construction.

Therefore, it is necessary to make clear that when the term 'opportunism' is used in this thesis to describe the practices of contractors outlined in chapter 5 it is not being used in Williamson's sense of opportunism as a fundamental behavioural characteristic.

6.4. Managing Contractors - Two Routes to Improved Performance

There are two basic ways in which managing contractors can improve performance against schedule on large construction sites. Firstly, they can undertake no direct production themselves, monitoring the contractual performance of other contractors, seeking to reduce opportunism and passing on risk. Secondly, they can undertake direct production themselves, seeking to make overall efficiency gains by integrating design and construction, and they can seek to enter into cooperative, higher trust relations with other specialist contractors.

These two routes to improved performance are alternatives. They imply a fundamentally different treatment of design, and a fundamentally different relationship between firms. In the first route the essential characteristic of design is that it must be fixed, because a fixed design will reduce the space for the opportunistic practices outlined in chapter 5. The relationship between firms is essentially low trust - firms expect each other to act opportunistically and the strategic emphasis is upon preventing the position where contractors bear the costs of other firms' opportunism, and upon fostering a position where their own firm's opportunism can benefit them. In the second route, the design can be fluid, and have 'constructability' (see Tatum et al., 1984) issues central to it, i.e. issues of how to build more efficiently. Further, there is an exchange of information between construction and design in which solutions to problems in design are dependent on information which can only be gained in the construction process. This concept of the symbiotic fluidity of design and construction has been remarked on by a number of authors (Abernathy et al, 1983; Streeck, 1991) as applying to other sectors of the economy. The common characteristic of these sectors is that they are product innovative. Competition is as much in terms of product innovation as price. Of course, ECI large site work can be similarly characterised as product innovative; indeed, many plants are unique. Here in this second route the nature of information exchange and the belief that material benefits will be shared implies the need for high trust, cooperative relationships between firms.

Whilst these two routes can both improve economic performance they have differing implications for longer term economic development. The first, fixed design, passing-on-risk, route implies a short-term, 'step' gain through the reduction of opportunism. The second, fluid design, high trust, route implies the potential for longer term gains in performance. It will be shown that managing contractors in the UK in the 1980s have followed the first, fixed design, passing-on risk, route.

Indeed UK contractors remain so firmly meshed in this approach that an attempt by a client to foster longer term, higher trust relationships at a project was undermined. This information is based on an interview with a management official of contractor A.a., and does not relate to project A. The managing contractor had recently been chosen by a client as a long term 'partner', with a guarantee of work which arises for a number of years in order to facilitate cooperative relations between client and managing contractor. On the first project, which was concurrent with project A, the interviewee stated that the client 'raised an eyebrow in surprise' at the decision of the managing contractor to subcontract out the civil engineering work, and 'raised another in dismay' when the decision was taken to subcontract out a large section of the mechanical engineering work. Such a strategy of passing on risk, of not undertaking direct production, was central to how this managing contractor was used to operating in the UK, and indeed is central to how all managing contractors operate in the UK.

Further evidence is required to substantiate these assertions that managing contractors have improved performance against schedule through the first, fixed design, passing-on-risk route. This evidence is offered in the following sections which examine the practice of passing on risk in a context of low trust relations, the treatment of design, the rise in subcontractors, and the changing form of contract. These sections will also address the precise mechanisms by which managing contractors improved performance against schedule.

6.5. The Low Trust Route - Passing on Risk

The central point to note is that managing contractors have not altered the short-term, conflictual, low trust relations which characterised the industry in the 1960s and 1970s. Rather, their role has primarily been in terms of limiting the opportunities for contractors to undertake the opportunistic practices outlined in chapter 5.

The contemporary site-based research reported in the previous chapter put into sharp relief the underlying relations between units of capital in the industry. Given that two of the four sites at which interviews were undertaken had managing contractors present it should be seen that managing contractors were an integral part of evidence concerning these relations. In particular, managing contractors played a central role in the discussion of commercial scenario/withholding information.

Further evidence that managing contracting has not fundamentally altered the low trust relations of the industry is provided by the fact that the OCPCA members of the National Joint Council (NJC) were as opposed as the NECEA members to the proposal that contractors be required to reveal productivity information to the NJC. This opposition was discussed in chapter 4. This withholding of information must be interpreted as an expression of low trust relations. Importantly, managing contractors played a full role in this.

Important indicative evidence of the mechanisms by which managing contractors have improved project performance is present in the comment made by a management official at contractor B.d. that 'under a managing contractor there are more commercial battles. I'd rather work under a client any day'. The manager interviewed at contractor C.e. stated that 'we are much more likely to get squeezed [under a managing contractor]. It's always easier money when you deal direct with the client'. Similarly, the project manager at the managing contractor at site D stated that 'contractors used to be able to get money from clients like turning on a tap. Managing contractors have changed that'.

Contractors prefer working for clients rather than managing contractors because under the latter there is greater pressure to work according to the terms of the contract, and less likelihood of being granted extra payments. Contractors feel 'squeezed' by managing contractors because an integral element of managing contracting as it has developed in the UK ECI has

been the practice of 'passing on risk'.

In their early years of competing in the UK large project market, some managing contractors employed labour directly (e.g. this was the case in the two refinery case studies reported by the 1976 NEDO report, and in one of the two projects covered by the unpublished internal 1982 NEDO report). However, increasingly the norm became to subcontract out all construction work, thus employing no direct labour. Indeed, only one major project since 1985 has been undertaken by a managing contractor who hired labour direct.

Essentially, managing contractors compete by offering management services rather than by offering to improve the efficiency of production directly. This was obviously manifest on a sub-project at site A. The client put a plant out to tender to be built by a managing contractor on a turnkey basis. Contractor A.a. bid for the package on this basis. The management official of this contractor who was interviewed stated that if their bid had been successful they would have subcontracted out all construction work, employing no direct labour. However, their bid had not been successful. Another managing contractor had won the contract. This managing contractor had put out the construction work to tender and the contractor A.a. bid successfully for part of this, and was therefore employing labour directly, and was hired to undertake construction work. The strategic decision to subcontract out all construction work if their original bid had been successful was justified in terms of

'it's all about passing on the risk'. It is also relevant to note that the particular contract was not perceived by any of the parties to be one of high risk. Indeed, as noted in the previous chapter, it was possible to avoid a potential commercial bias scenario between the managing contractor and contractor A.a. because a directoral-level meeting decided that an amicable share of the 'lucrative' contract was possible.

As they have developed through the 1970s and 1980s, managing contractors have become institutions which offer management services and which pass on risk, but which do not directly control and seek to improve productive efficiency. This has important implications for the nature of the association between managing contractors and project performance.

To fully understand these implications the concept of passing on risk needs to be examined in more detail. The Second Edition of the Oxford English Dictionary defines risk as 'hazard, danger; exposure to mischance or peril' and 'the chance or hazard of commercial loss'. As such, an institution which passes on risk is an institution which is faced with a situation of potential loss and which is able to transfer this potential loss on to another institution. In the particular case of the ECI the potential loss exists in the inability of a contractor to undertake the work set out in the contract within the time set out in the contract and at a cost less than that set out in the contract. Passing on risk can be understood as occurring when a contractor perceives a potential overrun of time or budget on

construction work and transfers this potential overrun to another contractor.

Therefore, an institution which is characterised by passing on risk has a relationship with economic performance that is limited in nature; limited in terms that it is defined by its transferring potential overrun rather than by its gaining profit by directly seeking to improve productive efficiency by cutting construction time and costs. Passing on risk implies a relationship with economic performance in terms of preventing overruns rather than in terms of improving productive efficiency.

This discussion throws up two more relevant questions - how exactly does the passing on of risk by managing contractors tend to prevent overruns?; even though managing contractors are not directly concerned with improving productive efficiency, does an indirect link in a long term framework, perhaps through the competitive tendering process, exist? These will be addressed in turn.

The mechanism by which the practice of managing contractors passing on risk tends to prevent overruns can be conceptualised as follows. At the top of the hierarchy the managing contractor bids for a complete project package from the client on a fixed sum basis. Let us call the accepted tender bid X pounds. The managing contractor then divides the project into a number of packages of work and puts out these individual packages to tender for a total of Y pounds. These main contractors will undertake

part of the construction package directly themselves, at a cost of Z1 pounds, and will also subcontract elements of the packages for Z2 pounds. The contractors further up the hierarchy ensure that $X \text{ pounds} > Y \text{ pounds} > Z1 + Z2 \text{ pounds}$. The key point to note is that whilst the tender price is falling as a piece of work is transferred down the hierarchy there is no necessary corresponding reduction in the time taken to do the work, and as such, no necessary increase in productive efficiency as defined in non-monetary terms.

This system inherently implies a hierarchy amongst the contracting firms. Two integral elements here are, firstly, that large firms are able to find smaller firms who will accept the work at a lower price than the one at which the larger firm secured the work, and secondly, that the larger firm is able to resist claims for extra payments against it from the smaller contractor. This is an analysis of the structural conditions underlying the feeling among contractors that they are being 'squeezed' by managing contractors or by main contractors.

The issue remains of whether there may be an indirect link between managing contractors' practice of passing on risk and the improvement of productive efficiency. The most obvious mechanism for such a link is the neo-classical notion of increasing efficiency over the longer term through the competitive tendering process. As noted in chapter 5.4., this argument rests upon the assumption that the profit base for the contractor exists within the terms of the contract. Although

managing contractors have made the opportunities for extras less frequent the situation still exists in which contractors regard their tender bid as the 'bottom line', in the words of the client industrial relations officer at project B (also cited in chapter 5.4.). This means that the process remains a flawed mechanism for the longer term improvement of productive efficiency.

Although in the above stylised account of passing on risk down a hierarchy of firms it was implied that the tender price is a relatively fixed, immutable figure, this was essentially to aid clarity of exposition. The original research reported in chapter 5 highlighted the fact that to a large extent tender price exists for contractors as a 'bottom line'. This argument is equally true for managing contractors. Thus, in Kharbanda and Stallworthy's (1983) account of the Conoco refinery it is stated that the managing contractor deliberately underbid with the aim of both breaking into that section of the world market and of generating extra payments from the client.

Supporting evidence of this was also obtained in site level research. The managing contractor A.b. was hired under the terms of a fixed sum turnkey contract, but at the time of the research was deeply involved in prolonged negotiations seeking to turn the contract into a reimbursable one on the basis that the client had given inadequate design information. The client industrial relations officer at project B stated that on a (named) previous project with which he was involved the managing contractor had been hired on a fixed sum basis but had sought to

generate extra payments from the client by 'playing off design against construction'.

Given, therefore, that the competitive tendering process is at best a flawed mechanism for improving productive efficiency it is clear that the managing contractors' practice of passing on risk is associated with improved project performance centrally in the sense of cutting overruns.

6.6. The Low Trust Route - Design and Construction

Managing contractors play a pivotal role in the relationship between design and construction, a relationship which, as was argued in chapter 5, is central to the link between capital and economic performance.

A number of authors have advanced arguments to the effect that managing contractors, as institutions which unite the previously separate functions of design and construction, should constitute a major force for innovation, to the long term benefit of the economic efficiency of the industry. That the separation of design and construction is a block on sources of innovation has been put forward on a number of occasions. Winch (1984:3.44) states that the distinctive feature of the UK contracting system which has been most important in inhibiting innovation is that those responsible for design let the production work to a

completely separate organisation.

Similarly, Ball (1988:96) argues that 'the fragmentation of the building process between different enterprises involved in design, surveying, contracting, plant-hire and materials creates a minefield of dispute, delay, avoided responsibilities and missed opportunities for innovation'. In this context there is a potential breakthrough in the growth of managing contractors - this is recognised by Massoud (1988:78) when he argues that managing contractors should be seen as providing the opportunity to undertake complete work packages and to introduce suitable new techniques.

The existing evidence suggests that the full benefits envisaged by Massoud and implied by Ball and Winch have yet to be reaped. Also, given the relative lack of evidence on the issue, a more searching analysis suggests a cogent explanation for this lack of fulfillment.

The problem with the Massoud argument is that it concentrates on the technical aspects of the issue while ignoring~~x~~ considerations of the political economy of the industry. Massoud perceives design and construction coming together for the first time in a physical sense in one institution. From this he concludes that it must lead to innovations in the process of undertaking projects through the integration of design and construction. This, however, ignores considerations of the origins and nature of this institution, the managing contractor - considerations

which have been at the heart of much of this chapter so far.

The concept of innovation and increased productive efficiency through the integration of design and construction implies a symbiotic fluidity in which solutions to problems in design are dependent on information which can only be gained in the construction process, and in which a faster construction process is dependent on a design concept in which the aim for faster construction is a central defining characteristic.

This form of integration of design and construction implies a very different nature of capital relations than exists or has existed in the ECI. For the concept to be fully realised managing contractors would have to directly undertake construction activity, and if subcontractors were needed there would have to be trust-based co-operative relations between the firms. These forms of relations would be necessary to allow the free exchange of information, and transfer of costs that are inherent in the concept of integrated design and construction. As has been pointed out throughout chapters 5 and 6, capital relations in the industry are low trust, and conflictual in nature. Managing contractors have not reformed these relations but have grown from them. They have limited opportunistic practices, but must ultimately be seen as being part of these relations. Moreover, managing contractors do not directly undertake construction work.

This suggests that the key concern of managing contractors in

relation to design should be to ensure that it is fixed, not subject to late changes, and accurate. These questions will be of prime concern to the managing contractor because, as noted earlier, they will allow less scope for the construction contractors to claim extra payments from them, and therefore will allow the managing contractor to successfully pursue a strategy of passing on risk.

Evidence suggests that managing contractors have been pursuing a strategy concentrating on securing a fixed design, rather than concentrating on reaping the benefits of an integration of design and construction.

The management official from management contractor A.h. stated that 'ten years ago extras from design changes were common', but now 'managing contractors ensured that design was much tighter'. Similarly, the industrial relations officer of the managing contractor on site D noted that in the 1970s extras from design changes were the key source of profits for contractors but that 'they are not so common now'. The project manager of contractor B.d. noted that 'life's harder these days.... you can't expect as many major changes'. Further supporting evidence came from the official of a managing contractor who was interviewed at national level. He stated that the key reason for the success of managing contractors was their 'better control of design' (emphasis added- control implying the existence of a hierarchy rather than a fluidity of exchange).

The non-integration of design and construction by managing contractors was also manifest from the interviews given by the industrial relations officer and a senior corporate level management official for the client at project B. On a recent (named) project on which they had been involved, the managing contractor was hired with responsibility for both design and construction. The design, which was undertaken largely in-house, was of an inadequate technical standard. However, rather than seeking to ameliorate this core problem the managing contractor undertook to shift the blame for lack of progress on to the construction contractors. The client was unable to directly communicate with the construction contractors and the managing contractor used this situation to draw money from the client. As the industrial relations officer stated :- 'the last thing the managing contractor will say is the truth - that we are the cause of the problem.' (also cited in chapter 5.4.). It can thus be seen that a lack of integration of design and construction can suit managing contractors and their strategy of passing on risk, in that it allows for the possibility of shifting blame on to another party for problems created in-house.

The importance to managing contractors of ensuring a fixed design was shown in the experience of managing contractor A.b.. The management official of this firm stated that there were serious delays on the project largely due to severe design problems (the client blamed the managing contractor, whilst the managing contractor blamed the client for inadequate process definition). Because of these design problems the managing contractor required

the construction contractors to compensate for the delay by accelerating their work. However, the inadequate design information gave the contractors the opportunity to sit on the job, blaming the delays on design problems, whilst in fact deliberately compounding the delays by tactically slowing the work. The contractors were awaiting an explicit instruction to accelerate which would form the basis of a claim for additional payments.

Project A gave a stark example of the potential benefits of integrating design and construction, and the failure of managing contractors in the UK to become institutions which seek to innovate in this area. It will be recalled that on this project there were a number of sub-projects. On the major sub-project the client was in a direct relationship with the construction contractors, but on others managing contractors had been hired, because the client had insufficient in-house management resources to deal with the peak project workload. On these sub-projects where there were no managing contractors and where the client was undertaking the design work there was a deliberate policy of designing the plants with 'constructability', i.e. with considerations of efficient construction inherent in the design process (see Tatum et al., 1986). This was manifested in the layout of the piping which was deliberately organised to facilitate the efficient use of orbital welding equipment. An orbital welding machine replaces the labour of the welder in welding piping joints, undertaking this process more quickly and more accurately (requiring considerably less re-welds) on a stand-

alone basis. The optimum use of an orbital welding machine is where it can be set up on a position of easy access on a long run of similar welds. Its use is more efficient here because its set-up time is reduced. The plants were designed to facilitate just such a use, and the client bought a number of orbital welding machines and offered these on hire to the contractors. Therefore, orbital welding machines were in widespread use in the sub-project in which contractors were in a direct relationship with the client.

Such an integration of design and construction did not exist on those sub-projects in which contractors were hired by a managing contractor. Indeed, the management official of contractor A.a. stated that although the company owned its own orbital welding machine it had been 'of little benefit because of the lack of design and field planning to get clear runs'. Interviewees of two other managing contractors on the site stated that their company had not considered the option of encouraging the use of orbital welding equipment either by designing with its use in mind, or by purchasing these machines and offering them for hire to contractors on an easy access basis.

The point now should be obvious - why seek to innovate to make the construction process more efficient when your strategy is to pass on risk? It is also noteworthy that the client management officials who were interviewed at no point argued that managing contractors had been appointed with the explicit purpose of facilitating the integration of design of construction.

It is thus not surprising that the Construction Industry Research and Information Association in a document seeking to increase the use of managing contracting felt obliged to concede that 'from the case studies and possibly as a reaction to some of the more extravagant claims and generalisations made for the benefits of managing contracting, there are some doubts about its merits' (1983:7). The failure of managing contracting to innovate in the integration of design and construction is also made manifest by a NEDO Construction Industry Sector Group report on the possible introduction of 'partnering', i.e. long term trust-based relations, in the UK which argues (1991:20) that a major advantage of partnering would be to improve 'buildability' - thereby implicitly conceding that current relations and structures militate against this.

The lack of an integration of design and construction by managing contractors must be set beside the fact that technological innovations have made such an integration increasingly feasible in a technical sense. Just as the growth of integrated Computer Aided Design/Computer Aided Manufacture (CAD/CAM) systems in manufacture in the 1980s have allowed for an increasing integration of design and production with a blurring of previously distinct functions, so the availability of CAD and Project Planning Systems (PPS) technology in construction has made such an integration increasingly technically feasible. However, the nature of managing contractors in the UK has meant that the technology rather than being used for an integration of design and construction has been used to rigidify the

distinction. CAD is used by managing contractors to make design more precise and more intricately specified. There has been no attempt to utilise the information feedback loops (Winch, 1991) which an integrated technology would allow. This flows from managing contractors following the low trust route to improve performance. Winch reports evidence that this non-utilisation of the integrating technology is also true for the wider construction industry. He states :-

'there have been very few attempts to link design and draughting systems with either quantity surveying or project management software to form a fully fledged CAD/CAM type system. Day et al. (1986) found no cases of data exchange amongst the case studies' (1991:156).

Therefore, analysis and evidence suggest that the growth of managing contracting has had an impact on design not through an integration of design and construction but rather through an emphasis on ensuring the design be fixed and accurate. Whilst this implies managing contractors have yet to lay the basis for longer term dynamic gains in economic efficiency, they have had an important short term effect in cutting project overruns by imposing a discipline or rigidity in the design process.

This discipline was lacking in the 1960s and 1970s before the growth of managing contractors. The survey of contractors on the 1970 NEDO report shows that 27% of companies ranked late design changes as the key reason for project overruns, by far the largest percentage for any category of explanation. The

importance of the lack of discipline in the design process is spelled out by the 1976 NEDO report (p.14) :- 'where the client retains considerable control, and particularly where, as in reimbursable contracts, the financial incentive to the contractor to complete the project within a pre-set contract price is absent, the discipline on the client's design changes (and the effectiveness of planning and monitoring procedures) has to be to that much stronger if the project is to be completed on time'. The report also showed that in two of the five case study projects subject to delay the lack of client discipline on design was a central reason for overrun. The extent of client lack of discipline is further underlined by the statement of the client project manager at site C that 'the control of the design technocrats is absolutely fundamental' to cutting overruns. Evidence presented earlier in the chapter that contractors now are less able to rely upon late design changes as a source of profit adds further to the case.

It is here that it is possible to understand the improved but not unproblematic performance of projects against schedule in the 1980s. The point is that if managing contractors' control on the fixedness of design occasionally fails then this greater opportunity for opportunistic practices will lead to problems compounding themselves and the delay growing. A PJC minute from a 1980s nominated project subject to delay is relevant here :- 'the trade unions were concerned at the possibility that high modifications manhours may delay the contract completion and yet again, they said, the men would be blamed for lack of production

and/or competence. Initially, they suggested that an independent survey be made to investigate the reasons for high modifications'. The union side here is clearly aware of the inevitability (in the context of the existing capital relations) of problems in design leading to contractors' opportunism and their shifting of blame for poor performance, often onto labour.

6.7. The Low Trust Route - Increasing Subcontracting

If passing on risk is as pervasive a characteristic of the industry as has been argued then an increase in subcontracting should have occurred. This is because the practice of pushing down the hierarchy of firms the responsibility for as much of the actual process of construction as possible should necessarily lead to an increase in specialist subcontracting.

In assessing any trend from the 1960s and 1970s to the 1980s it is necessary to be aware that subcontracting was already a widespread phenomenon in the late 1960s. The 1970 NEDO report conducted a survey of contractors, and had 260 questionnaires returned by site based firms, covering 16,563 manual employees - an average of only 64 manual employees per contractor per site. In the same survey 82 companies at head office level reported that on average 28% of their total contract value was to be subcontracted. Indeed, much of the report is premised on the assumption of the widespread nature of subcontracting, a premise which has the status within the report as being self-evidently

correct. For instance a report by the Department of Employment and Productivity, which constitutes appendix 3, states that the 'multiplicity of contractors and subcontractors is a major source of managerial and industrial relations problems' (1970:98).

From this already high level of subcontracting there are indications that it has grown still further. In the 1960s and 1970s scaffolding work was predominantly undertaken directly by main contractors, but in the late 1980s this would be extremely rare - scaffolding now being undertaken almost exclusively by specialist subcontractors. Similarly, in the late 1960s the pulling of electric cable was predominantly undertaken directly by the main electrical engineering contractor, but in the late 1980s this would be undertaken by a specialist subcontractor. These points were confirmed in interviews with management officials from specialist subcontractors, main contractors and clients.

6.8. The Low Trust Route - The Changing Form of Contract

Given the preceding arguments that managing contractors are concerned with passing on risk down a hierarchy of firms in a context of low trust conflictual relations, and have concentrated on the fixedness and accuracy of design, it should be the case that the frequency of fixed price contracts will have risen. It will be recalled that passing on risk relies upon the firm higher

up the hierarchy being able to control the costs claimed by the sub-contractor - this will be facilitated by the use of the lump sum contract.

The evidence strongly shows that there has been just such a shift from reimbursable to lump sum contracts from the 1970s to the 1980s.

Chapter 5 has already provided evidence that reimbursable contracts were widespread in the 1970s. That contracts in the 1980s changed to become predominantly fixed price becomes clear from examination of the field research. Excluding managing contractors from the analysis, of the 21 contractors whose management staff were interviewed, 13 had a fixed price contract, 6 had a fixed price bill of quantities contract with fixed pro rata increases, and 2 were on a reimbursable contract. These last contractors were both scaffolding contractors who were hired directly by the clients, with the clients providing scaffolding as a common-user service to other contractors. Similarly, the 1990 NEDO report on the 1989 Kodak plant noted that 'contracts between the managing contractor and the sub-contractor were of a 'lump sum' or schedule of rates type' (p.15).

The important role of the lump sum contract in helping to impose a greater degree of control down the hierarchy of firms than is possible with a reimbursable contract was evident in the experience of managing contractor A.b.. The managing contractor had been awarded a fixed price turnkey contract to construct a

plant. The schedule had been subject to considerable slippage, which the managing contractor blamed on inadequate design information from the client. The managing contractor had attempted to use this argument to persuade the client to change the contract to a reimbursable one, but at the time of the interview 'the client has stood his ground'. Contractors prefer reimbursable contracts, because this means that they cannot be 'squeezed'.

Whilst, theoretically, reimbursable contracts could imply a more trust based, cooperative relationship between firms, in the context of the ECI in which low trust, conflictual relations, and profit through generating extras and passing on risk are the defining motifs, a reimbursable contract is more a manifestation of a disrupted hierarchy. That there has been a dramatic switch from the 1970s and reimbursable contracts to the 1980s and lump sum contracts is testimony to the assertion of hierarchical relations in the 1980s.

6.9. The Context of the Changes

There were two important contextual changes which facilitated success in the implementation of the managing contractors' strategy of passing on risk. The two changes were the fall in demand in the industry in the 1980s, and the fall in labour militancy in the 1980s (although also note that the fall in militancy was partly caused by managing contractors). These will

be addressed in turn.

A fall in demand will aid the strategy of passing on risk because passing on risk is predicated on a hierarchy of firms in which the firms higher up the chain are able to exert control over those lower down, and are able to resist attempts by those firms to claim extra payments. This form of hierarchical relationship will be at its most effective when there is a fall in demand in the industry - with the smaller, more vulnerable, firms prepared 'to be squeezed' so long as their survival is ensured. Stallworthy and Kharbanda, using slightly different terminology, note the importance of this :- 'there is yet another practice, described by the term 'bid shopping', where the main contractor presses for ever lower bids in order to increase his own profit margin. Sadly, many of the smaller subcontractors, fearful of losing work, are prone to retreat under pressure, and reduce their prices' (emphasis added) (1985:107). The clear implication is that in a slump in demand smaller subcontractors will be more 'fearful of losing work', and therefore more susceptible to be squeezed.

Evidence suggests that a slump in demand occurred from the early 1980s. The most reliable evidence on shifts in demand over the period is provided by the Review of the Engineering Construction Industry (1990), written by Clifford of the Engineering Industry Training Board (EITB). Figure 6.1. reproduces a graph from this report which shows the total expenditure on process plant, i.e. in the ECI, at constant (1986) prices. The table is based on

forecasts and measures of investment in process plant compiled annually by NEDO. The table indicates a rise in investment from the mid-1970s to a peak in 1978-79, with a slump from then until 1983. Investment remained at this level until 1987 at which point the graph indicates a rise.

Figure 6.1. Total Process Industries Expenditure on Process Plant at Constant (1986) Prices

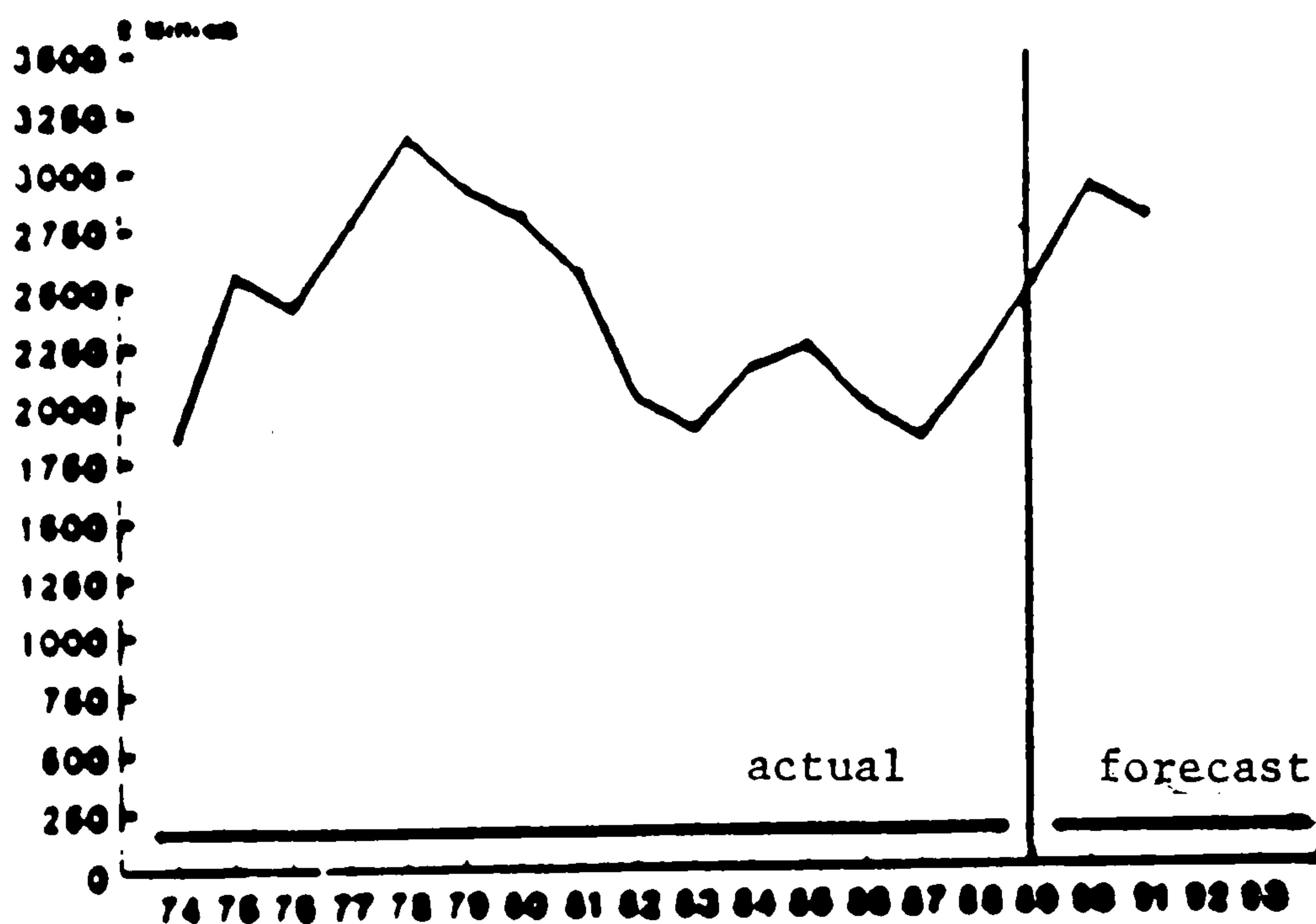


Table 6.1. shows the estimated number of employees, both manual and non-manual, on on-shore ECI sites from April 1978 to 1989, based upon EITB statutory returns. Overall, there was a 46% drop in on-shore labour from 1981 to 1989, with the sharpest fall occurring between 1985 and 1987. The report notes that 'the decline in employment is spread across all major types of on-shore projects' (p.9) and the the 'workforce.... tends to be concentrated in a small number of very large operations' (p.1).

Table 6.1. Estimated Number of Employees on On-Shore ECI Sites
1978-1989

Date	Employees on ECI Sites
1978	22,181
1979	21,845
1980	21,613
1981	21,883
1982	17,551
1983	16,251
1984	16,319
1985	16,822
1986	14,330
1987	9,936
1988	11,818
1989	11,854

Source: Clifford (1990:table A2 - source: EITB statutory returns)

Whilst there are certain inconsistencies between sources about the precise nature and timing of the fall in demand, taken as a

whole the evidence shows that there was a fall in demand near the beginning of the 1980s with a potential recovery becoming evident towards the end of the decade.

The other important 'contextual' change was the fall in labour militancy in the 1980s. This is included as a contextual change for simplicity of exposition. The drop in militancy was caused by a number of factors, amongst which the rise of managing contractors is included. Further details are given in chapter 8. A fall in labour militancy is an important contextual change in that labour militancy in the 1960s and 1970s was used by contractors to avoid tighter control by clients and managing contractors and was used by contractors as part of their strategy of profit creation through extras. The details of these uses of labour militancy will be spelled out in chapter 7. A fall in labour militancy will allow tighter control by managing contractors and facilitate a strategy of passing on risk.

6.10. The Power Station Sector in the 1980s

It was noted in the discussion of the growth of managing contractors that in the power station sector no managing contractors were employed in the 1980s, except for small sub-sections of nuclear power stations, because it was believed that there were no managing contractors in the UK capable of undertaking a project as large as a power station. The power station sector was therefore excluded from the discussion of the

implications of the growth of managing contractors, and the subsequent discussions of increasing sub-contracting/passing on risk, and the changing form of contracts.

Although managing contractors are absent in this sector, the story of changing capital relations and their impact on economic performance in the 1980s mirrors the story of the other sectors, with the difference being that contractors have been 'squeezed' directly by the client, rather than by managing contractors. Improvement in performance against schedule in the power station sector has come about through an assertion of hierarchy and control amidst the unchanging milieu of low trust conflictual relations.

The Monopolies and Mergers Commission (1981), the House of Commons Select Committee on Energy (1981) and the Wilson Report (1969) all provide a clear picture of a context in the 1960s and 1970s in which contractors enjoyed 'easy money' in the words of the project manager of contractor C.a.. Given an understanding of the focus of contractors in generating extra payments, the environment of substantial design changes, and reimbursable contracts in the 1970s, as described by these reports, can clearly be expected to lead to precisely the substantial overruns that were witnessed at the end of the decade.

In the 1970s the CEGB adopted a strategy of letting reimbursable contracts and cutting back on the number of direct contractors and indirect sub-contractors. This decision was partly

influenced by the suggestions put forward by the 1970 NEDO report and partly by the ability of contractors to resist lump sum contracts (see House of Commons Select Committee, 1981:para 2176). Whilst the 1970 NEDO report had envisaged a relationship of mutuality between client and contractors to underlie a reimbursable contractual relationship, what in effect occurred was that the contractors took advantage of the conditions which 'allowed us to increase our profit as we increased the amount of hourly labour', in the words of the project manager of contractor C.d. who was also a management official for the same firm at Littlebrook power station in the late 1970s.

At the end of the decade, however, the CEGB undertook a number of measures which strongly echoed the developments in the other sectors of the industry. For the Drax coal-fired power station and the Heysham 2 nuclear plant which both began at the start of the 1980s, 'it is now the CEGB's policy generally to avoid the use of reimbursable contracts and to place lump sum contracts coupled with incentives and a 'key-date' procedure.... The essence of the key date procedure is that at the beginning of a contract, targets are set for the amount of work to be completed in each 6-month period. If any part of the work is not finished by the agreed time, the contract payment due at that date can be withheld until the delayed part is complete' (Monopolies and Mergers Commission, 1981:260).

Similarly, the CEGB policy emphasised the necessity of the fixedness of design, rather than seeking to integrate design and

construction. This is amply demonstrated in the following passage from the MMC report :-

'In order to overcome the delays caused by design changes during construction, the CEGB's policy is now to have all substantial design work completed by contractors before manufacturing of hardware begins.... This policy has been implemented for the advanced gas cooled reactor (AGR) at Heysham 2 for which a separate design contract has been let, rather than as often in the past, a combined design and build contract' (1981:259) (emphasis added).

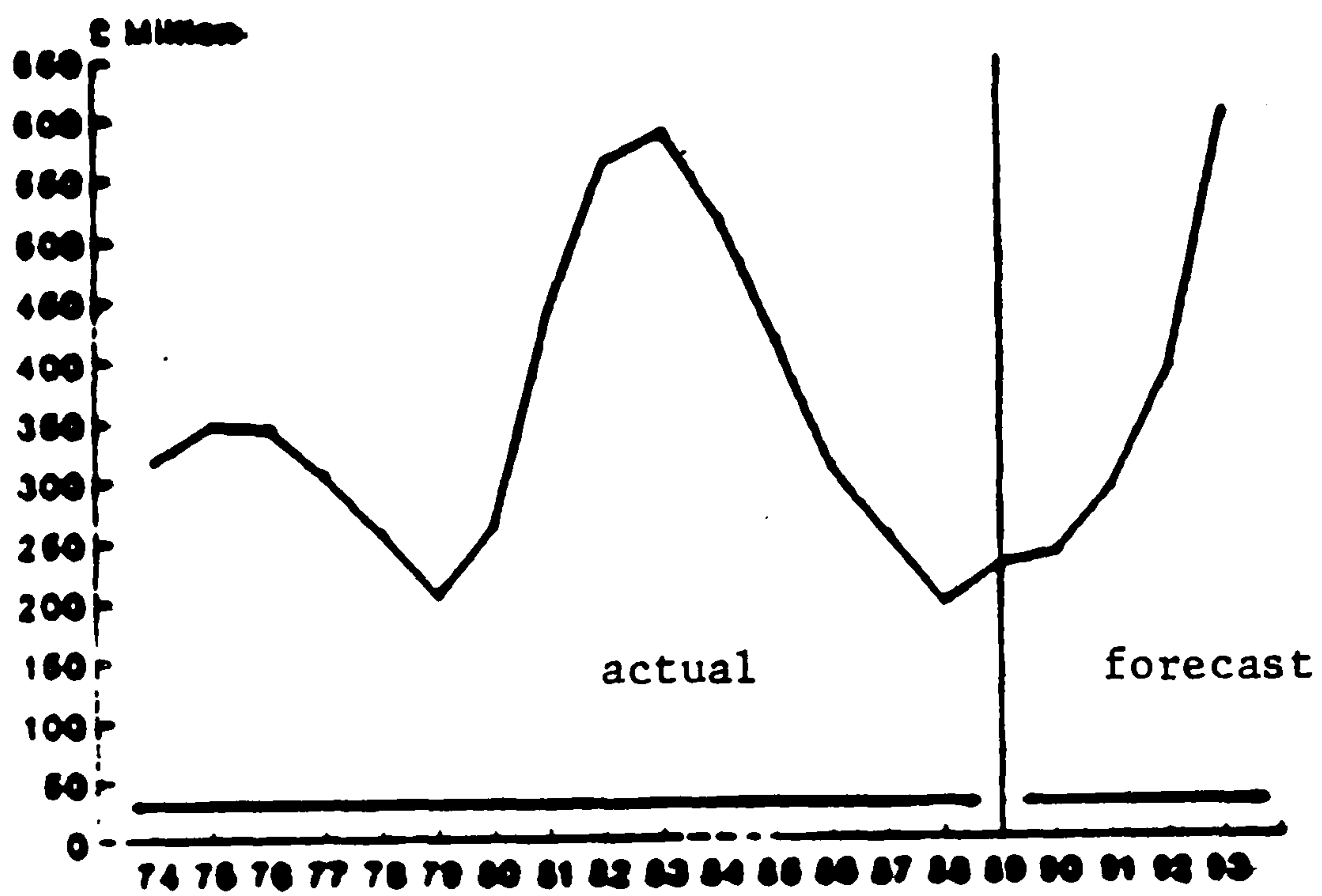
The client project manager at site C reiterated this policy when he stated that 'the control of the design technocrats is absolutely fundamental' to the successful completion of a project (also cited in section 6). Further, the Chief Engineer of a power station client's construction division wrote to NEDO concerning the publicity attempts on improvement in performance in the following terms :- 'a major factor has been that we are building an established rather than a prototype design as was the case for all previous UK nuclear power stations. The importance of the design being sufficiently complete before site construction starts is of course well known but it is so important that it cannot be given enough emphasis'.

The assertion of hierarchical relations, its consequent squeeze on contractors, and their consequent reaction of passing on risk, is eloquently demonstrated in the words of the project manager of contractor C.b. :- 'since Drax the CEGB has been very keen on

controlling costs....major changes used to be common, but not now....we are using a cable-pulling subcontractor, it's better for someone else to shoulder the blame, and we get a mark-up'.

Assisting this assertion of control based on hierarchical relations has been a severe cutback in orders for power stations, i.e. a slump in demand in the sector. Figure 6.2. (from Clifford, 1990:7) shows the level of investment in electricity industry process plants at constant (1986) prices. This shows a peak demand in the early 1980s, with a sharp fall from around 1983. An assertion of control and hierarchical relations by the CEGB in the early 1980s occurring simultaneously with a peak demand appears somewhat contradictory. This can be explained by noting that the peak investment of the early 1980s was due, not to substantial new orders but to the completion of a number of severely delayed projects. As such, the CEGB's actions took place in a period of low orders - only five new power stations were ordered in the 1980s (Drax, Heysham 2, Torness, Kilroot, and Sizewell B), whilst at the time of its publication in May 1981 the MMC report could note that eight stations were under construction.

Figure 6.2. Electricity Industry: Expenditure on Process Plant
at Constant (1986) Prices



6.11. The 1980s - Stagnancy in the Efficiency of Construction

The preceding sections of this chapter have argued that an assertion of hierarchical relations, the practice of passing on risk, and increasing rigidity in design have led directly to the fall in project overruns witnessed in the 1980s. A corollary of this argument, and a sub-theme throughout this chapter, has been that whilst these changes in capital relations have impacted directly on performance against project schedule, their impact on the efficient organisation of production has been much less significant. This section seeks to put forward more evidence pertaining to this corollary argument.

Two types of evidence will be examined - indirect evidence which is analytically supportive of the overall argument, and direct evidence on the continued existence of widespread inefficiency in the industry. The direct evidence will be examined first of all.

In the on-site research, of the twenty one contractor management officials (excluding managing contractors) interviewed, ten stated that they had knowledge of productivity assumptions underlying their firms' estimates over the previous decade. Three stated that there had been a 'slight' increase over the decade, whilst seven stated that there had been 'no change' in productivity assumptions over the decade. No contractor official

stated that there had been a 'substantial' increase over the decade. Such findings suggest support for the corollary argument, especially bearing in mind that contractor officials could be expected to over-report productivity increases, rather than under-report.

Another indicative piece of direct evidence was provided by activity samples that had recently been undertaken at site A and site C. These activity samples were organised by the client, and consisted of taking a large number of observations of people in their working environment; their activity is recorded and classified into pre-defined categories of construction work, movement, miscellaneous, and not on plot. Reasons of confidentiality prevent me from reproducing these figures. However, the key point is that they produced figures within the range of figures provided by activity samples of 6 UK sites for the 1976 NEDO report,. On the 6 sites there was an average of 26% of the paid period spent on construction activity.

The 1976 NEDO report interpreted their findings as demonstrating a highly inefficient organisation of production. Given that the two activity samples from 1991 gave comparable results, this indicates that this high level of inefficiency may well have remained largely unchanged. Furthermore, it is noteworthy that it was the clients, rather than the individual contractors, who undertook the activity sampling.

The next indicative piece of direct evidence is based on

interviews with the client industrial relations official on project B. On the previous (named) project on which he had worked he had initiated a productivity improvement pilot scheme in which supervisors of a number of selected contractors filled in daily reports of length of periods of inactivity and their reasons. This scheme found that substantial periods of inactivity occurred, with the primary reason being lack of materials and lack of planning. Documents, including supervisor returns, pertaining to this scheme were examined, and confirmed the points made in the interview. The official had suggested that this scheme be widened to cover all of the contractors on the project, but the project manager had vetoed this, arguing 'I don't want to be told how bloody inefficient my contractors are, I already know'.

The final piece of direct evidence suggests that contractors continue to put little emphasis on productive efficiency. In this case it is manifest through an example of a contractor not measuring the work undertaken. An internal NEDO note from 1989 details a joint client/NEDO exercise to measure productivity on a particular site. Part of the exercise entailed a 'weekly comparison of work completed and man-hours expended against the NEDO norms. For this it was necessary to be provided with accurate measurements by the contractor of work completed on specific items of work, e.g. individual pipelines etc. in each week and the actual man-hour allocation to this work'. However, this turned out not to be possible :- 'despite promises, regarding the information that could be made available.... the

contractors were not measuring work completed in any accurate sense'. The contractor involved was a major contractor.

Issues concerning the quality of supervisors in the industry provide analytically supportive evidence of the thesis of stagnant construction efficiency in the 1980s. Given the necessary dislocation on large sites between the place of production, the work face, and the place of material storage, the supervisor plays a key role on planning the materials' requirement to ensure a steady flow of work. Further, the supervisor must play an important role in planning for potential access problems. In short, the quality of supervisors will clearly impact decisively on production efficiency. The 1970 (p.29) and 1976 (p.6) NEDO reports and the 1981 House of Commons Select Committee report suggested that the ECI was plagued by the poor quality of supervision.

In a memo to the House of Commons Select Committee, Babcocks, a leading contractor, stated that the quality of supervision was poor and ascribed this to the shortage of able candidates. The joint trade union body, the National Engineering Construction Confederation, in their evidence also stressed the poor quality of supervision and management (1981:644). Rather than accept Babcock's bland explanation of the poor quality of supervision, the reader should be able to see that poor supervision connects very directly with the analysis of capital relations that was put forward in chapter 5. Given that contractors sought to gain profit through generating extra payments rather than improving the efficiency of production, it follows that improving the

quality of supervisors who are only tangential to the practice of claiming extras will not play a central role in contractors' strategy.

If the analysis of capital relations presented in this chapter is correct and if the corollary argument of stagnating efficiency is correct it can be expected that the poor quality of supervision will have remained a chronic problem. This appears to be the case given that the Engineering Construction Industry Training Board and the NJC in 1989 began discussions in attempting to instigate a supervision training scheme. In these discussions emphasis was laid on the continuing low quality of supervision staff.

6.12. Conclusion

This chapter has examined the role of capital relations in the turnaround in performance against schedule in the 1980s. It pinpointed the growth of managing contractors as the key reason for the turnaround. Managing contractors, by monitoring, passing on risk, and emphasising the fixedness of design, served to limit, but not eliminate, the opportunities for construction contractors to undertake practices which harm performance against schedule. A fall in demand and a fall in labour militancy aided this process by facilitating an assertion of hierarchical relations by managing contractors.

This approach by managing contractors was characterised as the low trust route to improved performance against schedule, and the consequent improvement in performance was seen essentially as a step rather than the establishment of a basis for longer term improvements in performance. Evidence of the stagnating production efficiency was presented in the final section.

Why managing contractors in the UK have undertaken the low trust route rather than the high trust route is an important question. Questions concerning the use and establishment of trust are difficult to address at the best of times (see Sabel, 1992), but in situations where research does not involve a comparison of a high trust situation with a low trust situation it becomes impenetrable. Some useful points can be made, however. It is clear that with the sustained fall in labour militancy in the 1980s the uncertainties concerning labour could no longer be considered a constraint preventing the establishment of trusting relations between firms. In a situation of high labour militancy there would be a disincentive for firms to enter into trusting relations in that firms would be unsure of both themselves and other firms performing as per the agreement. In a situation of no strong labour militancy no such disincentive exists.

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A potential constraint on managing contractors adopting the high trust route in the UK could be the managerial quality amongst both themselves and their subcontractors. For the high trust route to be successful, especially in the area of the integration of design and construction, there is a requirement for a high

level of managerial skill in the organisation of production and in the processing and communicating of relevant production information. However, given the legacy of contractors' management emphasis in creating profit outwith the production process, such skills connected with the production process are likely to be rare. Contractors' management staff may be highly skilled in their opportunism and contractual knowledge but not in their knowledge of production. Relevant here is the observation in the unpublished 1982 NEDO report which notes that the (foreign) managing contractor at one of the projects expressed criticism 'at the lack of good managers, planning and scheduling staff within UK subcontractors'. Another potential constraint concerns the nature of the client-managing contractor relationship. If clients were unprepared to enter into longer term high trust relations with a managing contractor this clearly will impinge on the managing contractor's ability to attempt to undertake the high trust route.

Finally, managing contractors may have been constrained by the subcontractors' continued opportunism. If this is a significant constraint it may be that the industry will be locked into a system of low trust relationships for some time in that the competitive tender process may undermine any learning process which may lead to behavioural modification (as in the repeated Prisoners' Dilemma with voluntary participation). In a situation of lower demand, i.e. lower participation, increasing numbers of contractors will face the threat of bankruptcy. This threat will force them into underbidding at the tender stage which itself

begets a whole series of other opportunistic acts if the tender is accepted. The tender may be accepted because the client/managing contractor has incomplete information. The realisation that opportunistic contractors continue to win tenders may negate any behaviour modification arising from lower participation. This reflects the argument of J.S. Mill that rules of competition are set by the morally least reputable participant.

CHAPTER SEVENLABOUR RELATIONS AND ECONOMIC PERFORMANCE IN THE 1960s AND 1970s7.1. Introduction

The thrust of the argument put forward in this chapter is that a question such as 'what percentage of poor performance against schedule was due to labour?' is not appropriate. This is because the practices of labour cannot be adequately understood in terms of their impact on the economic performance of the industry if they are seen as standing separately from the commercial arena of client-contractor relations. A better way to examine the relationship between labour and economic performance is to examine the dynamics of the interaction between labour-capital relations and capital-capital relations. The interconnections between the industrial relations arena and the commercial arena are stressed throughout this chapter.

Another key argument of the chapter is that the nature of capital relations was the root cause of poor performance against schedule in the 1960s and 1970s. This statement does not contradict the argument concerning interconnections put forward in the preceding paragraph. To put forward an argument that Y caused X% of the poor performance is a distinctly different argument from one proposing that Y is a root cause of a system of interconnections

which led to schedule delay. The prior argument implicitly denies the relevance of systemic interconnections whilst the latter explicitly recognises the point and puts forward a further argument concerning the root cause of the system of interconnections. To say that there existed such a system is not to say that it is not possible to tease out these interconnections and put forward an argument concerning their root cause.

The assertion that capital relations rather than labour relations constituted the root cause of the systemic interconnections causing poor performance rests upon three premises. Firstly, the detailed evidence on particular manifestations of these interconnections point to the primary role of capital relations. This is the most useful and compelling evidence, and forms the main substance of this chapter. Secondly, the contemporary interview evidence in chapter 5 on the opportunistic practices of contractors showed that these practices continue their existence in a context quite separate from high levels of labour militancy. This therefore means that labour militancy cannot be seen as a necessary element in the causation of contractors' opportunism. Thirdly, the 1970 NEDO survey of contractors discussed in chapter 5.3. provides indicative evidence. The overwhelming emphasis of contractors in blaming overruns on issues pertaining to capital relations (74%) against issues pertaining to labour (24%) can be seen to support the argument concerning the root cause of the system leading to overruns.

In this chapter it will be shown that the material context for shopfloor militancy was set by the strategic emphasis of contractors upon the commercial arena as a key profit locus, and this militancy was used by contractors to reproduce the form of client-contractor relations which underlay the severe schedule delays of the period. Labour militancy contributed to, but were not the root cause of, the systematic reproduction of schedule delays in the 1960s and 1970s.

This chapter consistently argues against drawing a simple causal relationship from labour militancy to schedule delay. This is done by focusing on each of the major contours of labour militancy and examining its relationship with performance against schedule. Therefore, the different sections in the chapter do not add new elements to the argument, but serve to provide detailed evidence supporting the argument.

An important characteristic of the labour militancy of the period was the nature of workforce and shop steward power, and the form of their interest definition. Section 2 shows how the militant anti-employer interest definition of 'the cabin' was created in the material context of the casual nature of employment, the buoyant labour market, and the fact that labour was forced to bear the costs of both inefficiencies in the organisation of production (a corollary of the contractors' emphasis upon extras) and the deliberate practices of contractors (such as sitting on the job) which served to slow up the job.

Section 3 of the chapter maps out the main form of labour militancy in the period and argues that the importance of strikes for economic performance lay not only in their direct impact upon performance against schedule, but also in the way they were used by contractors in their commercial relationship with clients, particularly in the way they allowed contractors to pass on blame to labour. Contractors would occasionally deliberately precipitate disputes, but more generally they would seek to benefit from their occurrence by using them as opportunities to undertake opportunistic practices and avoid tighter control.

The main causes of strikes embraced both issues of 'work control' and 'economism' (Price, 1980). Therefore, the remaining sections in the chapter focus on particular issues in both of these areas. Section 4 examines bonus schemes and differentials, and argues that the contractors' strategic emphasis upon profit outweighed the production process meant that they relied upon the bonus scheme as their key labour control strategy. However, these two strategies lay in contradiction in that the opportunistic practices outlined in chapter 5 served to disrupt the flow of production necessary for at least the partial 'success' of labour control through a bonus scheme. The dynamics were such that the subsequent labour militancy was used by contractors to further loosen commercial control by clients.

Section 5 examines three issues of work control - overtime, shiftwork, and manning - which can be expected to have an important relationship with performance against schedule in that

they are the routes used to attempt to catch up an existing delay, to accelerate production against schedule. The argument that labour militancy in these issues directly prevented attempts to catch up delay is shown to offer an inadequate understanding of the social processes in that it ignores the contractors' incentive in slowing up the job, and contractors' lack of managerial skill in the efficient organisation of production. Further evidence on other work control issues is presented in appendix 2.

The evidence used in this chapter is based on both primary and secondary documentary sources. The bulk of the primary sources derive from the OCPCA, the EEF, and the AEU-CS records held at the Modern Records Centre, University of Warwick. In addition, reference is occasionally made to contemporary interviews with relevant actors from the period.

7.2. The Cabin, Shop Stewards and Union Democracy

The section seeks to establish the nature of power relations within worker organisation in the 1960s and 1970s and to establish the significance of this in terms of the interest definition of the shop stewards and workforce which informed their action. The section firstly provides evidence from the 1960s and then examines attempts in the late 1960s and in the 1970s to formalise labour relations. It then moves on to examine the material context which informed the interest definition of

the workforce and the stewards.

The 1960s

The report on labour relations at the Llanwern steelworks site 1960-62 written by the local EEF official (Berry 1963) indicates strong shop steward and cabin power (each contractor's workforce is known as 'the cabin'), with a severely curtailed role for FTOs. In a very detailed description of the site organisation of the Constructional Engineering Union (later the AEU-CS) a clear picture emerges. The author is very conscious of the distinction between FTOs and shop stewards and the cabin. It is therefore significant that he describes the 'stranglehold' over contractors as having been achieved 'by the CEU stewards and rank and file members' (emphasis added) (p.9). Further, a shop steward committee was formed, deliberately separate from the official union machinery - 'stewards formed the committee, and invited the FTO to attend its fortnightly meetings.... generally it would seem that the committee acted as pressure group operating against the full-time union official and official constitutional policies of the union, and the committee's existence tended to prevent his being able to influence the rank and file membership' (p.35). It is apparent also that the shop steward committee did not of itself constitute a strong, legitimate and separate power base within the worker organisation on the site - 'there is no evidence to suggest that the committee normally formulated positive and detailed concerted policies or plans on specific questions and instructed all stewards to follow

such policies'. It is also clear that shop stewards did not exist in a bureaucratic relationship (see Hyman, 1979) with the cabin - the author calls for shop steward training and complains that 'shop stewards are increasingly merely spokesmen for the men' (p.45).

Similar points emerge from the internal unpublished OCPCA report on productivity written in 1967. The report notes that 'operatives believe that it is their democratic right to hold meetings and stop work without penalty, at any time to discuss any and every problem they wish whether real or imaginary'. A motif of cabin autonomy and independence begins to emerge from the evidence - 'the meetings are frequently held without notice being given to management' (p.11). The OCPCA committee is so concerned at the uncontrollable nature of the worker organisation that it calls for shop stewards to be appointed by the official union machinery in order to wrest authority back from the cabin.

Attempts to Formalise

In the late 1960s a number of major oil and chemical clients established site agreements which set uniform earnings and which sought to concentrate the negotiating authority in the hands of the FTOs whilst trying to severely restrict the role of the shop stewards.

The coherent picture which emerges of the limited impact of the site agreements at Grangemouth, Baglan Bay, Llandarcy and Hull

upon the nature of the power structure within worker organisation on site is particularly relevant given that these sites can be regarded as exceptions in the sense that deliberate and consistent attempts to give authority to FTOs were undertaken at these sites, unlike at the majority of other sites. The clients who set up the site agreements had a clear policy of attempting to bolster the official union hierarchy - a letter from the secretary on the contractors' group to BP states that 'in the opinion of the Policy Committee, unwavering support of the agreed procedures and of the full-time trade union officials is our best hope of avoiding the disintegration of authority which is so evident on many large sites around the country'.

The first such agreement was established by a major client, BP, at Grangemouth in 1968, and this subsequently applied to BP sites in Hull, Llandarcy and Baglan Bay; Shell established a similar agreement at Stanlow. The agreements provided for monthly joint site multi-contractor and multi-union meetings (stage 3 meetings) which would deal with all issues not settled at individual contractor level. The site agreements aimed to curtail the issues which could be dealt with at the individual contractor level. This was aimed at mitigating shop steward power, for shop stewards were not allowed to be full members of the stage 3 meetings. At Grangemouth a concession was given such that three shop stewards were able to attend as observers, but were unable to speak at the meetings. The notes of these meetings suggest that this condition was observed. In interview the secretary of the contractors' group confirmed this impression.

The agreements explicitly outlawed the recognition of a shop steward committee. Although the notes of the stage 3 meetings make occasional mention of the existence of a shop stewards committee the non-recognition clause was adhered to by contractors. Given the argument that shop steward committees did not constitute a separate locus of power within worker organisation this was perhaps the easiest element to control through the agreement. An area shop stewards committee covering three major projects in the Grangemouth area existed in the mid-1970s. From interviews with two members of the committee it emerged that it primarily undertook actions such as coordinating donations for other labour movement causes, and for the family of workmates who died either on or off site. Indeed, it is not clear how different these functions would have been even if the contractors had granted them official recognition.

Whilst the site agreements (none of which applied to power station projects) were successful in excluding shop stewards from the official and significant negotiating forum, this is not to say that this led to a significant reversal of authority. In 1969 at Grangemouth and at Baglan Bay the contractors conceded a paid meeting of stewards with FTOs before the stage 3 meetings, thus allowing for the possibility of FTOs to be mandated at the meetings. That the locus of power continued to be located in the cabins and with the immediately accountable stewards is evidenced by occasional lapses by contractors in dealing directly with stewards - in 1970 at the stage 3 meeting at Baglan Bay the FTOs criticised the contractors for putting safety proposals direct

to shop stewards, by-passing the FTOs, and in 1977 at Grangemouth the contractors met directly with the shop stewards in order to achieve acceptance of a productivity deal. The locus of power is amply shown in the 1978 stage 3 discussion of a proposed code for wet weather working put forward by contractors with the FTOs stating that 'it would be referred to site before further discussion' and also in the 1977 negotiations at Grangemouth concerning a strike by pipefitters over the union membership of the foreman. The notes of these negotiations state that the FTO 'on arrival at site was told by two shop stewards that if the foreman was to join the EETPU the men would return to work....but at a mass meeting it transpired that the two shop stewards had not had a mandate, and the meeting voted to continue the strike' (emphasis added). The 1970 remit by the Secretary of the Baglan Bay contractors' group to the Department of Employment and Productivity concerning the operation of the site agreement argued that 'there is evidence of a gulf between the attitudes of the men and their FTOs, the latter broadly accepting the provision of the agreement but being unable to persuade their members accordingly'. This report also noted in frustration the failure to create a bureaucratic relationship between the shop stewards and the cabin :- 'it is significant that the turnover in shop stewards is unusually high, and this may reflect a difference in attitude between the stewards who have attended seminars [on the site agreement] and the rank and file who have not'.

The direct democracy of spontaneous cabin meetings was in

evidence in the early years of the site agreements. In 1970 at Grangemouth the contractors complained that the 'shop stewards and men are walking off site without approval' in order to hold meetings. In 1969 at Baglan Bay the contractors criticised the 'number of meetings employees had been holding without permission. Also in the 1971 national level negotiations the contractors, listing problems of compliance with the agreement, noted that 'trade union meetings continue to be held during working hours'. At Baglan Bay the contractors sought to formalise and control the nature of the direct democracy practised by the cabins by granting in 1971 a paid half-hour meeting of shop stewards to members in the form of a 'report back' of the stage 3 discussions. There is no evidence concerning the effect of this formalisation and redefinition of cabin meetings. In relation to this it is perhaps significant that the same contractors at Grangemouth did not follow the strategy of formalisation. Direct democracy in the form of site-wide mass meetings is also in evidence. At the time of the 1970 wage negotiations at Grangemouth for the site agreement the FTOs informed the contractors that 'meetings have been held off site at which FTOs were not present. The men had come forward with some strong points of view from these meetings'. In the 1977 wage negotiations at Grangemouth the FTOs stated that there had been a mass meeting followed by a shop steward/FTO meeting.

Both the clear attempts of the new site agreements to alter the nature of power relations within worker organisation and limited impact of these attempts explain why resistance to the site

agreements was mostly confined to speeches in official union channels and occasioned relatively little on-site action. The AEU-CS witnessed a series of motions to the Executive committee and debates at the biennial conference which featured rank and file disapproval of site agreements. For instance, a motion from South Wales argued for full discussion of site agreements at branches 'before our constitutional rights are signed away'.

Despite the antagonism expressed by delegates to pre-negotiated and signed site agreements, on-site resistance to their imposition was relatively limited. At Ince Marsh in 1969 there was a clear and direct clash between the two conceptions of the power structure of worker organisation. At an Executive meeting it was reported that 'instead of the members appreciating what had been done they had reacted violently at a Site Mass Meeting'. The Executive endorsed the Ince Marsh site agreement and instructed the local FTO to sign appendix D of the agreement which was particularly resented on site. The local FTO refused to follow these instructions. The General Secretary then visited the site and addressed a mass meeting. The meeting demanded that a vote be taken, and although the General Secretary refused to acknowledge the legitimacy of the vote the meeting rejected the appendix. The unrest on site was such that the Ministry of Labour had to summon a meeting of the involved parties in order to facilitate a settlement.

At Grangemouth it was the ASBSBSW who sought to resist the site agreements by withdrawing from the procedures in 1969. This led

to a mass dismissal of ASBSBSW members and the offer by other unions to provide welding labour. Also in 1969 at Grangemouth the national level stage 4 minutes report that 'each FTO of the 5 craft unions had received a letter from their steward giving 3 months notice to terminate the agreement'. The national officials implicitly denied the authority of the stewards to withdraw from the site agreement by telling the contractors 'they regarded the stewards' letters as serious documents'.

Other Evidence from the 1970s

The more limited evidence that exists on the (more common) sites without a site agreement indicates continued cabin power. The argument that shop steward committees did not constitute a separate and legitimate power base in the period is confirmed by the nature of the shop steward committees that were officially recognised at power stations in the 1970s.

The constitution of the Littlebrook committee indicates that the committee had only a limited role. In particular, the circumscribed nature of its authority is revealed by the clause that the 'right to strike by any work committee or union will not be interfered with'. Power remained with the cabin. Similarly, Paling's (1982) discussion of the Dungeness shop steward committee indicates the locus of power remaining firmly in the cabin - all decisions by the committee had to be endorsed by the entire union membership on site. Individual cabins would vote and exact numbers for and against counted. Notes of a stage 4

(national level) meeting between the EEF and the unions provide further support for this point. At Inverkip power station there had been a number of site-wide walk-outs prompted by bomb warnings. Contractor management were forced into a de facto recognition of the shop steward committee in order to establish an agreement on procedures in case of future bomb warnings. The shop stewards and management came to an agreed procedure but 'it appeared that the men had different ideas about the acceptability of the procedures'.

Perhaps a more typical site in this period was the Monsanto textiles and utilities projects at Seal Sands in Teeside. The FTOs of the area Confederation of Shipbuilding and Engineering Unions attempted to maintain authority within the official union structure by entering into area-wide negotiations with contractors, drawing up the 'Teeside Understanding' which sought to impose uniform conditions within the area. This strategy failed to dislocate the independent power base and action of the cabin and the immediately accountable stewards at Seal Sands in 1975-77. The circumscribed authority of the FTOs in the monthly joint union-contractor meetings is indicated by the minutes which state that although stewards would not be in attendance at these meetings they 'would be in attendance in the building' during the meeting. The frequent adjournments noted in the minutes of these meetings attest to the frequent reference back to shop stewards by the FTOs. When the minutes of the November 1977 meetings state that 'the trade unions stated that the three representatives would report back to the other shop stewards and

recommend acceptance' it is clear that the phrase 'report back' here is being used in a distinctly different manner to that utilised by the contractors at Grangemouth.

The FTOs were aware of their eroding authority - at the June 1977 meeting they complained that increases in bonus had been conceded 'without any consultation whatsoever with the FTOs.... in response to continuing shopfloor pressure'. The FTOs argued that 'the contractors had no right to undermine the authority of Trade Union Officials by conceding such sums direct to the shopfloor'. That the shop stewards' role was dependent upon the ultimate authority of the cabins on site is evidenced by the fact that in 1976 a decision to work to 'maximum safety' had only been taken after a decision of a site-wide mass meeting. The self-activity and high level of participation of the workforce is clear in the dispute in October 1976 in which a mass of workers queuing for chinstraps for their safety helmets led to the dismissal of 700 men.

This consideration of the evidence on worker organisation on site indicates that despite attempts at formalising and reversing the flow of authority it remains appropriate to characterise the period of the 1960s and 1970s as one of cabin power. A new General Secretary of the AEU-CS was therefore correct to talk at the 1977 biennial conference of a change in the locus of power which had yet to be accomplished :-

'some people in this movement may wish to destroy the authority of the Executive Committee and General

Secretary. I do not think that is what Conference wants. So what we have to do is to restore leadership and authority and negotiating ability back where it belongs and that is with the leaders of the unions'.

The importance of establishing the precise nature of worker organisation in this period becomes clear when it is realised that the interests of the cabin and the shop stewards are such that they are likely to inform practices which will impact negatively on economic performance. This is in contrast to the interests of the national union officials - an argument which will be developed in chapter 8.

Material Context and Interest Definition

Before examining the material context of cabin militancy it is necessary to first address why worker militancy took a collective, rather than an individualistic, form - 'whether work groups form, and if so how strong the norms governing behaviour are, cannot be assumed in advance' (Edwards, 1988:191). Parallels with docks are useful here. Edwards (1988) argues that the casualism in the docks did not lead to 'complete anarchy' because of two factors - the differentiation of workers by skill and type and the organisation of workers into gangs. Both of these factors are relevant to the ECI. The differentiation of workers by skill and type partly follows the contours of demarcation of units of capital, arising from the growth of

specialist subcontracting - scaffolders work for scaffolding firms, cable-pullers work for cable-pulling firms, ladders work for lagging firms. Gang/team work is a central feature of production in the ECI. In the same way as loading a cargo 'needs a team including workers on the quayside, crane operators, slingers and.... men who packed goods in the hold' (Edwards, 1988:206), so the laying of pipework in metal frames in the ECI requires riggers to load the pipework, crane operators to move it, labourers to unload it, and pipe fitters to make the preliminary joins.

The key material context which informed the interest definition of the cabin and shop stewards was the casual nature of employment in the industry. The 1970 NEDO report conducted a survey amongst contractors concerning various aspects of labour relations. Eighty six contractors took part in the survey covering 'nearly 27,000 operatives engaged in industrial construction work generally' (p.71). 'The survey asked contractors to state roughly what proportion of their site operatives employed in mechanical and electrical engineering construction were regarded as permanent for all practical purposes' (p.76). 37.1% of craftsmen were regarded as permanent employees, 30.4% of semi-skilled employees, and 16.8% of unskilled employees. The contractors were also asked to give the duration of employment of the current craftsmen within the company. 21.1% had been employed less than 6 months, 48.2% less than a year, and 82.1% less than 5 years (cumulative percentages).

The casual nature of employment meant that the quicker and the harder the cabin worked the sooner they would be without a job. Concerning the introduction of a number of completion bonus schemes in the North East in the mid-1970s, one delegate at the 1977 AEU-CS biennial conference stated that 'employers are offering completion bonuses in the North East because with the shorter contracts and the Employment Protection Act men are on notice almost as soon as they are taken on, and the employer needs to motivate them'. As such the possibility of cabin and shop steward power serving to directly benefit performance against schedule through a craft productivist ethos (see Edwards and Terry, 1988) is effectively denied by this material context. The lack of a productivist ethos is evident from the unpublished 1967 OCPCA report on productivity : - 'to the work the operative is generally indifferent. More operatives work in construction for the high financial rewards than for interest in the job. Construction work is not made attractive and involves working in the worst possible conditions, away from his family and in sub-standard lodgings, working long hours, suffering constant labour disturbances and under untrained supervision'.

The thrust of chapter 5 indicated that the key strategy for maximising profits by contractors was through an emphasis on exploiting the (many) opportunities to extract additional payments from the client rather than on increasing the efficiency of the production process. This necessarily implies that at no point in this period did the workforce experience a concerted attempt to increase the rate of exploitation. This expectation

is confirmed by the conspicuous absence in the historical sources covering the period of systematic complaints of actions most commonly associated with attempts to increase the rate of exploitation such as speed-ups, tightening of general discipline, and tightening of time discipline. Thus, it is no surprise to find that at a special 1981 AEU-CS conference the President attacked contractors for increased exploitation, not of the workforce, but of the clients - 'in a cut-throat industry where employers have exploited to the full for many years the market forces in order to bleed clients irrespective of whether they are private or public sector, it is ironic that we should stand accused by this government's Monopolies Commission of learning the lesson of employers to the benefit of our members'.

This lack of an attempt by contractors to increase the rate of exploitation should perhaps suggest that the workforce would be less likely to define their interests in opposition to managerial demands. However, this would be to ignore that labour was often in effect forced to bear the costs of either gross inefficiencies (a corollary of the contractors' emphasis on extras) or the deliberate practices of contractors (such as sitting on the job) which served to slow up the job. There are a number of pertinent examples of labour bearing the costs of inefficiencies in project organisation. At the Isle of Grain (which later witnessed a lengthy and damaging strike by ladders) ladders were hired on the client's instructions only to be 'made redundant through lack of available work' just three months later (House of Commons Select Committee, 1981:940). In 1971 the AEU-CS Executive discussed a

report from an FTO 'that due to some design problems arising a number of members were declared redundant'. This directly led to a strike. Further, the graphical representation of the manning levels on a project provided by the 1976 NEDO report shows a succession of four sharp peaks and troughs indicating an eccentric overall phasing of recruiting and redundancy by contractors. The first Director of the NJC provided a fitting illustration of the second way in which labour came to bear costs. He spoke thus at the 1983 AEU-CS biennial conference :-

'there is no point in a client letting a contract to a contractor who says he does not have to be interested in productivity by, for instance, a cost-plus type of contract where it is actually in that contractor's interest not to complete the job quickly, to overrun and to do all those other things, and then at the same time say to the contractor 'But you must put in an incentive scheme for the men'. The men will be pulling to make the job good and productive but the contractor's management will not do anything to ensure that they can be productive because that does not meet with the contractor's objectives'.

The unpublished 1967 OCPCA report on productivity recognises that the workforce tend to define their interests in opposition to management : 'to management and supervision he (the operative) is generally antagonistic. Historically and because of the present working rules and conditions of work, he is in conflict with the 'other side' who (in the operative's opinion) is always trying to recover the 'rights' his union and brothers have fought

for in the past and is constantly asking him to work in unreasonable conditions'.

Another important element of the material context of the period was the buoyant labour market, particularly in the 1970s. A buoyant labour market existed not just within the ECI itself - the AEU-CS reported its peak membership in 1979 - but also within the wider economy. A buoyant labour market will tend to facilitate militancy because it will engender a greater sense of 'confidence' on site.

These characteristics of the material context, which informed the interest definition of the cabin and the shop stewards, will tend to create a militant, anti-employer short-term definition of interests. In particular, in this context the workforce can be expected to aim for a maximisation of earnings during their short-term periods of employment (the 'quick penny' in the words of the NEDO pamphlet What's Wrong on Site?, 1971), and to undertake job controls and job protection to attempt to prolong these periods and to reproduce the job's existence on the next project. The militancy of the cabin and the stewards in this period was therefore informed by both 'economism' and issues of 'work control', to follow the terms utilised by Price in his 1980 study of the formalisation on industrial relations in the construction industry in the nineteenth century. Whilst Price writes of 'the clash between.... work control aspirations.... and economism' (p.135), in the context of the ECI in the 1960s and 1970s, Hinton's characterisation (of events in the first world

war) is more apt :- the 'development of local collective bargaining occurred not at the expense of workshop organisation and bargaining, but in symbiotic relationship with it' (1973:79). Given that contractors' strategic emphasis lay outside the sphere of the production process the cabin and the shop stewards were aware that they could formally agree to specific work controls being bought out for a 'quick penny', secure in the knowledge that their self-activity together with the contractors' consistent lack of emphasis on the production process and inability to efficiently organise the production process would ensure that in reality on site these work controls would remain secure. Thus, in 1977 at Grangemouth the shop stewards with reference back to a mass meeting agreed to a twelve point productivity package in return for a substantial productivity payment. Constituent clauses pertaining to welders grinding and cleaning their own welds, and to craftsmen undertaking slinging and lifting were still far from universally applied even in 1991.

The power of the cabin and the material context informing their interest definition were such that the direct effect of the practices of the cabin and the shop stewards was harmful to performance against schedule, but the question remains concerning its indirect effect. Did the cabin militancy push contractors into altering the form of their profit strategy, ultimately leading to a beneficial effect on performance? Whilst theoretically possible, in the context of the client-contractor relations of the period this did not occur. Rather the power and practices of the cabin which were dependent upon both a subverted

client-contractor hierarchy and poor performance served to reproduce and exacerbate both of these elements. Rather than pushing contractors into altering their profit strategy cabin militancy existed in a symbiotic relationship with the inefficiency-creating practices of capital.

7.3. Strikes, Go-slows, and the Role of Contractors

This section examines the manifestations of labour militancy in strikes and go-slows, firstly examining the pattern of disputes and the causes of disputes, and then examining the crucial role of contractors in understanding the relationship between labour militancy and economic performance.

Strikes and Go-slows

The most obvious and direct way in which labour relations can impact upon performance against schedule is through the withdrawal of labour which directly delays production. Given that the ECI does not have a separate classification within the Department of Employment's dispute statistics it is not possible to give a precise overall picture of the level of disputes in the period. The most reliable and informative source is contained in the CEGB's submission to the Sizewell 'B' Power Station Public Inquiry. This contains the number of stoppages and the percentage of hours lost on CEGB construction sites between 1963 and 1980, and is reproduced below as table 7.1.. The average

level of hours lost from 1963-69 was 1.07%, the average level from 1970-80 was 3.52%, and the overall average for 1963-80 was 2.57%. It is to be regretted that the precise definition of a strike used by the CEGB in compiling these statistics is not given.

These figures indicate that stoppages per se could only directly account for a small proportion of the delays experienced in this period.

TABLE 7.1. Stoppages on CEGB Sites, 1963-80.

Year	No. of Stoppages	Manhours Lost	% Manhours Lost
1963	Not Available	164,716	0.73
1964	88	345,192	0.84
1965	124	507,944	1.04
1966	187	517,075	0.94
1967	215	576,574	1.17
1968	377	454,748	0.89
1969	402	784,685	1.89
1970	429	391,623	1.41
1971	574	325,776	1.32
1972	135	1,3000,490	6.19
1973	216	454,512	2.49
1974	148	447,799	2.55
1975	229	635,882	3.37

1976	221	1,574,415	7.73
1977	287	655,176	2.95
1978	311	1,310,121	5.76
1979	303	751,768	3.37
1980	261	322,781	1.58

This argument is supported by disputes figures from a number of sources concerning individual projects. Given the diversity of sources it is unlikely that a consistent definition of time lost to strikes is being used. As such the figures should be used with great circumspection, and regarded as illustrative. Berry's (1963) study of Llanwern steelworks found that a total of 328,129 hours had been lost on the project. Although unable to report this as a percentage of total hours, Berry states that this is an 'extremely insignificant percentage of the total time worked....probably below the national average'. Portus (in Wearne, 1970), of ICI, reports that at the major construction works at Wilton 1.5% of hours were lost to strikes in 1965, and 0.8% in 1966. The 1976 NEDO report included case studies of six UK projects and reports percentage time lost for strikes on the projects as ranging from 1% to 6%. The unpublished 1983 NEDO report on two refinery projects built in 1978-82 states that the second of these projects lost 3.5% of hours to strikes. The 1982 paper by Carr and Williamson (of BP) on the BP Sullom Voe project records that in 1979 the mechanical engineering workforce lost 2.8% of hours, 4.1% in 1980, and 0.4% in 1981.

Moving the analysis on from the point that the level of hours lost to strikes appear to vary from 1% to 6% and therefore cannot

be held directly responsible for average delays of far greater levels in the 1960s and 1970s, it is necessary to question whether a strike will delay the schedule by an amount equivalent to its total duration. A number of considerations are relevant here. The direct impact of a strike upon the schedule delay will depend upon the point of the project at which the strike occurs, and whether the strike is of direct production workers (e.g. welders) or of ancillary workers (e.g. scaffolders). A minute from a 1985 project joint council meeting at Heysham 2 power station is relevant here. The contractors expressed concern at the level of strikes but added that 'the level of hours lost may well be made up in the overall progress but would be disastrous if still there during commissioning phases, which are essentially in-line operations, and every hour lost is irretrievably lost in the programme'. The commissioning phases represent a small proportion of the total construction schedule, and are concentrated towards the end of the project. The quotation also raises questions concerning the ability (and willingness) of the client and contractors to make up for delays in the overall progress. Important considerations here will be the potential for and the effect of increasing manning and introducing overtime and shiftwork. Each of these will be addressed later in the chapter.

Further points which should not be overlooked here are how far complete withdrawals of labour constituted the main tactic of the workforce in this period, and also how far disputes were associated with other practices which directly affected the

project schedules.

Alternative practices to a withdrawal of labour which can be regarded as directly delaying production are 'go-slows' or 'working to maximum safety'. Overtime and shift embargoes which cannot be classified so unambiguously will be examined later in this chapter. Conflicting evidence exists on the extent of the use of go-slows by the workforce. Berry (1963:68) argues that at the Llanwern steelworks the 'very widespread' go-slows 'must have resulted in the loss of many times the man-hours by strikes'. The Commission on Industrial Relations' 1972 study of the Alcan smelter project, in a comprehensive description of conflict on the site makes only a parenthetical mention of such practices :- 'throughout the [3 month] period a pattern developed in Peirson and Cleveland Bridge, and to a lesser extent in Teeside Bridge of claims which, if not conceded, were quickly followed by overtime bans, restrictions on output or stoppages of work' (p.7). In the evidence on the Isle of Grain project to the House of Commons Select Committee there is one mention of go-slows. The unpublished 1967 OCPCA report on productivity in its examination of all the practices which contribute to the poor performance of the industry makes no mention of go-slows or working to maximum safety. Consideration of these practices is conspicuous by its absence in the unpublished 1983 NEDO report on two refinery projects, and in the 1986 NEDO report on the Sullom Voe project.

In the minutes of the stage 3 meetings at Grangemouth from 1968

to 1981 these practices are mentioned on three occasions. In the Baglan Bay stage 3 minutes 1969-72 there is one mention of a 'general slowdown throughout the site' 'in an endeavour to push Power Gas Corporation to take on platers'. Similarly, the Seal Sands minutes 1975-77 contain one reference - in October 1976 after a mass meeting held concerning the bonus level 'the men worked to maximum safety and non-cooperation'. Also the minutes of the Executive Committee and the Biennial Conference of the AEU-CS which were inspected contain one reference - at Didcot power station 'as a result of allegations of the members going slow and working to rule etc. the employers sacked riggers and fitters'.

From this summary of the available evidence and bearing in mind the caveat that go-slows may not have been recorded within the minutes of meetings inspected, it is concluded that the Llanwern project, where Berry argued the hours lost to go-slows outstripped those lost to strikes, was far from common. Go-slows were a tactic occasionally deployed by the workers but far less commonly than withdrawals of labour. Indeed, this pattern is not unexpected in light of the material context of employment. In the same way as the casual nature of employment militated against the strategic use of sanctions for dockers (see Phillips and Whiteside, 1985), so it can be expected that the casual nature of the job in the ECI will tend to have the same effect.

Given the conclusion that strikes were the main manifestation of disputes it is useful to examine evidence on the cause of

strikes. This is important in assessing how far the labour militancy of this period can be characterised as predominantly economic in nature, and how far it was informed by issues concerning work control.

The 1970 NEDO report gives relevant information. In 1965, 1967, and 1968 the Department of Employment and Productivity conducted 'three ad-hoc surveys of stoppages due to industrial disputes on large industrial construction sites.... The surveys cover together the period January 1964 to December 1968. For these five years, 718 disputes are recorded.... resulting in about 483,652 man days lost. Most of the disputes were unofficial.... It should be noted that no uniform definition of large sites was used in the first two surveys so that there is no absolute guarantee that all large mechanical sites were covered. Secondly, the information required from the regional industrial relations officers was not specified in great detail so that the amount and content of information supplied differed from region to region.... A further reservation to be made is that DEP is not informed of all disputes. Moreover, DEP's definition of a dispute for statistical purposes excludes stoppages involving fewer than ten workers, and those which lost less than one day except any in which the aggregate number of working days exceeds 100. Many minor disputes or occurrences therefore are omitted' (p.105/6). This final point warrants special emphasis given that the strike statistics available for some projects in the 1980s indicate a high occurrence of half-day or one-day 'fliers'.

The report details the cause of strikes as per table 7.2..

TABLE 7.2. 1970 NEDO Report - Cause of Stoppages

Issue	Percentage
Wage - Bonus	24
Wage - Other*	17
Dismissal	19
Site Conditions	8
Working Practices	7
Sympathy	7
Demarcation	5
Redundancy	3
Other	10
Total	100

Note - * including overtime disputes.

These figures indicate that whilst a large proportion of strikes were centred around issues of wages (41%), it would be incorrect to see this as the sole important cause of labour militancy. Rather, issues concerning work control - dismissal, control of overtime, demarcation, working practices, redundancy, and even

site conditions and sympathy - also represent a key dimension in labour militancy. This indicates the importance of examining issues pertaining both to economism and work controls in greater detail in order to tease out the nuances of how labour relations impacted on economic performance. The following section deals with incentive bonus schemes and differentials which primarily address economic issues; the subsequent section deals with overtime, shiftwork and manning, which can be interpreted primarily as issues of work control (evidence on time-discipline, absenteeism, and wet weather working, also issues of work control, is presented in appendix 2).

The Role of Contractors

This discussion of disputes and their direct and indirect effect on economic performance against schedule has so far stressed the agency of labour and has examined the industrial relations sphere in isolation from the commercial sphere, i.e. from the client-contractor relations. It is therefore apposite to note the words of the client industrial relations officer at site B :- 'the thing about industrial relations being to blame for poor performance is a myth perpetuated by management to cloud their own inadequacy.... by the nature of the contracting industry somebody had to be blamed, and labour was often the easiest to blame'. This implies not only that contractors sought to take advantage of labour disputes in order to deflect blame or to re-negotiate contractual terms, but also that they had an incentive

to deliberately create and/or prolong a dispute - in the words of the management official from contractor B.a., 'if you wanted a dispute, you knew how to have one - all you had to do was lower the bonus or sack the steward'.

Given that contractors at the time of the disputes would necessarily seek to deny any blame in relation to their own actions this activity is unlikely to be heavily documented in the minutes of meetings. One exception is the minutes of the London meeting of the BP Contractors' Policy Group in January 1970. BP were expressing concern at the ladders' strike at Grangemouth being supported by an unofficial strike over the whole of Scotland. The chair, from BP, noted the lack of progress in negotiations between the Thermal Insulation Contractors' Association (TICA) and the GMWU, arguing that this was due to an unrealistically low wage offer put forward by TICA. In addition the chair 'doubted whether the insulating contractors were anxious to resolve the strikes at Grangemouth as they were short of men and were also looking for an opportunity to claim a revision of their contracts'.

Although not constituting as direct a piece of evidence of the purposeful actions of contractors as the above, the minutes of meetings in Grangemouth in 1969 concerning the major boilermakers' dispute of that year highlight the contractors' concern with the contractual implications of an extended dispute :- a contractor 'raised the question of who had made the decision not to make tradesmen redundant, arising from the ASBSBSW

dispute. No definite answer was given although it was stated that this was a decision made by the London Negotiating Committee and Policy Group.... [the contractor] asked who would bear the loss incurred on any fixed price contracts. It was generally agreed that it was up to the individual contractor concerned to make representations'. This minute highlights the interconnections between the commercial arena and industrial relations arena by showing the sort of way in which contractors can seek to gain opportunistically in their commercial relationship with the client through events in the labour relations arena.

Another illustrative example, this time of the material incentives for contractors to undertake such practices as creating/prolonging disputes, is provided by documents pertaining to a dispute and its surrounding events on a nominated project in the early 1980s (see Note 1). Other important related themes also emerge, particularly concerning the importance of passing on blame to labour. The PJC minutes from the project show a progressive increase in the delay on the project with the main contractor arguing that the problem was due to severely low productivity of pipework from the on-site fabrication shop. In particular, the contractor claimed that low productivity was due to 'welders deliberately limiting output' in order to increase overtime hours and bonus payments. Initially, the FTOs on the PJC made pertinent observations concerning the poor organisation of the shop and asking why the problem had not been raised before 'a full-scale crisis', but even they were persuaded by the

contractor's argument to hold a mass meeting and call for an increase in production. The position deteriorated and the contractor threatened to subcontract the pipework fabrication to an off-site workshop. The FTOs intimated that if this was to occur they would be powerless to prevent a walk-out. At the same time it emerged that the production of pipework had been undertaken out of sequence such that the delays on the project were also due to the inability to erect even that amount which had been fabricated. In light of the subsequent events, described below, it appears very likely that the contractor's intention to sub-contract was aimed at creating a major dispute. This much is also implied by a letter from the local FTO to the General Secretary of the AEU-CS which poses the question of why the contractor was prepared for a major dispute for 'just 4 weeks fab shop time' and answers it by stating 'there must be far higher stakes', the latter being a clear allusion to commercial arrangements with the managing contractor/client.

The unions called for an independent enquiry under NJC auspices to investigate the problem. The contractor's antagonism to NJC interference is manifest in a telex sent by the firm to the NJC Director :-

'Despite our religious upholding of the agreement, the workforce and the FTOs have not done so. The Agreement has failed totally, supporting the NJC merely entails the employer in higher costs whilst employees lose nothing, extend their employment period and create a third body with whom to negotiate. It

is critical that the NJC Field Officer address FTOs and obtain their commitment to NAECI and transmit that idea to the workforce'.

The NJC decided to hold an enquiry and with local consultation appointed a committee comprising FTOs, contractor representatives and the NJC Field Officer. This committee found 'no concrete evidence that low output is entirely or even mainly the fault of the welders. Neither did the committee find any evidence of an organised limitation of productivity in the shop'. The deep-rooted failure of management organisation and monitoring is also apparent in the report's discussion of productivity levels. The report notes that output was consistently below the contractor's target figures. However, the 'committee was unsure that the target is correct, or if the output had been properly measured. In particular, the committee were unsure that all the waiting time had been accounted for, and believed that unrecorded waiting time may make some contribution to the low productivity levels calculated... the committee hoped to see some overall figures of shop productivity expressed in man-hours per foot or per ton but none existed'. Two confidential reports by the NJC Field Officer to the NJC Director confirm this picture. The first report stresses the succession of problems from the design stage to the fabrication stage to the construction stage :- 'one is left with the impression of an unrealistic programme, poor organisation, and the inevitable results'. The second makes similar points and stresses that 'labour relations despite a ham-handed performance by.... [the contractor] have been reasonably good and the FTOs cooperative despite some provocation'.

This can clearly be interpreted as an example of a contractor seeking to deflect the blame and responsibility for poor performance on to the labour force. Despite the investigation of the expert committee it appears that this passing on of blame was still partly successful in that a later report by the NJC Field Officer to the Director notes 'I spoke to the...[client] site manager who said that the NAECI is partly responsible for his predicament because he cannot call on draconian measures such as shiftwork and high incentive payments to buy his way out of his difficulty'. The report concludes 'it is outrageous that the NAECI and the labour force should be blamed for the shortcomings of project planning'.

It is apposite to note the pervasive effect of the systematic use of mis-information by the contractor - before the report of the expert committee, the FTOs were persuaded by the contractors' arguments, and even after the report the client continued to concur with the contractor's placing of blame.

Given this picture of successful systematic misinformation by the contractor, and given that this is one of the few cases of an independent examination of the causes of a project delay, this should serve to alert the reader to the strong possibility that other examinations of the industry which did not look critically at management definitions may have simply reproduced systematic misinformation which sought to deflect blame on to another party, in particular labour. This insight is pertinent when considering the 1976 NEDO report's analysis of the cause of delays in the

projects used as case studies (discussed in chapter 5).

The report of the expert committee and the implementation of a number of its recommendations concerning the organisation of production led to an improvement in production levels at the fabrication shop but other problems continued, as a confidential report by the NJC Field Officer shows :- 'the most incredible aspect of this is that all the effort and expense put into accelerating fabrication has been negated by the failure equally to expand NDT [non-destructive testing], painting and QA documentation capacity'. At this point the contractor announced the immediate (one day's notice) laying-off on basic rate only of 30 workers, This information was not communicated to the FTO until after the lay-offs had taken effect. This was contrary to all past practices and expectations, and led to an immediate walk-out by pipefitters which lasted for two weeks. A confidential report by the NJC Field Officer noted that the managing contractor 'was not informed of the lay-off until mid-day [on the day of the announcement]...., and was not prepared to intervene because of contractual implications' (emphasis added). Tellingly the report also notes that 'it is interesting to note that the two weeks pipefitters' strike and accompanying lay-offs must have been a godsend to.... [the contractor] because, as radiographic work could continue, it postponed the crunch by that period'. The term 'crunch' alludes to concern over the continuing existence of 'material supply difficulties'. As such, it is highly likely that this dispute was deliberately fomented by the contractor - possibly both as short term and one-

off attempt to cut labour costs (through the non-payment of wages during the dispute) and as an attempt to force the direct involvement of the managing contractor which could later be used as a basis for a claim for extra payments.

This discussion of contractors purposefully provoking and/or prolonging disputes and of contractors systematically seeking to misinform, pinning blame on labour for poor performance should not be interpreted as a form of conspiracy theory in which contractors' Machiavellian, behind-the-scenes manipulation can serve to explain the majority of strikes. This would both deny the agency of labour and credit contractors with a far greater ability to control and plan in this instance than they apparently possess in other aspects of labour relations and production. Rather it has sought to highlight how a simple examination of disputes which stresses the agency of labour and the direct effect of disputes fails to understand the social meaning of disputes within the context of the political economy of the ECI. Given the discussion of the material incentives and context of contractor action in relation to strikes and given the nature of client-contractor relations outlined in chapter 5 it is appropriate to argue that contractors in the 1960s and 1970s systematically sought to use withdrawals of labour to their advantage in contractual arrangements with clients. As part of this process it is to be expected that contractors would occasionally precipitate a dispute, but it is the wider process that is the key to understanding the full implications of strikes upon economic performance, implications which are mediated

through client-contractor relations. The words of the General Secretary of the AEU-CS at a 1981 conference have both resonance and profound implications for the relationship between the social relations of production and economic performance - he described the employers' attitude as 'our contract, our profit, our responsibility, but when anything goes wrong it's your fault'.

A further manifestation of this process of contractors using labour problems to their benefit in commercial arrangements with clients can be found at the Ethylene plant built at Baglan Bay 1969-72. The 1976 NEDO report states that 'the contractors were reimbursable with no incentive - the client asserted that this was not due to the lack of 'biddable' contract packages but rather to the conditions existing in the industry at the time, i.e. low productivity, poor labour relations etc.' (p.46) and that 'a few subcontractors who were employed on a schedule of rates basis found themselves governed by the slow tempo of the job and their position untenable. As a result these contracts were subsequently replaced by re-imbursable contracts' (p.34). Further 'in response to poor performance and a failure to meet the programme, site management built up the labour force (by over 100%) in order to meet their commitments. The site having been saturated with men, cause and effect became inseparable. Unit productivity fell even further.... overloading of site facilities led to further frustrations.... and a frequency of minor disputes' (p.46). The force of this description is to stress the debilitating effects of militant labour upon economic

performance. However, notes, made by a working party set up at the client's behest, of a discussion with the client offers a fresh perspective :- 'site managers [of contractors] had failed to save BP from themselves. Pressures are brought to bear from the client to get the job done quickly which usually resulted in the employment of more labour, at no time did site managers warn BP that further recruitment could lead to problems'. This implies a process in which contractors sought to encourage overmanning, a process which would lead to a slackening of commercial control.

A similar dynamic is shown in the evidence on the Isle of Grain project. In the evidence to the 1981 House of Commons Select Committee by TICA it is argued that lagging contractors come on site last and are under great pressure from clients such that management 'have been pressed by clients on a number of occasions to give way and a reimbursable situation has again developed towards the end of a contract' (1981:700). Such instructions from the client to accelerate on a reimbursable basis should not be interpreted as a manifestation of client strength, but rather of client weakness, perhaps in the face of contractor tactics of sitting on the job.

7.4. Incentive Bonus Schemes and Differentials

The evidence on immediate causes of strikes highlighted the importance of earnings and bonus payments in the labour militancy

of the period. Therefore, in order to examine in further detail the relationship between militancy and economic performance, and in particular the role of capital relations in this, it is necessary to analyse the disparity of earnings and widespread use of bonus schemes in the period.

The dominant picture which emerges from the extant literature on the ECI is one of militant economism by the labour force in the form of leap-frogging bargaining, exploiting the disparity of earnings applying to different groups of workers on large sites. What's Wrong on Site, the NEDO booklet version of their 1970 report stresses the problems caused by the workers' search for 'the quick penny' (1971). Also, Garfit highlights that 'in 1976.... a year when earnings were meant to be restricted by incomes policy, the bonus payments on Teeside rose by 33.3%' (1989:6).

There is, indeed, plenty of evidence of both the disparity of earnings on sites and the consequent leapfrogging bargaining. The 1970 NEDO report contains information derived from the questionnaire survey of contractors which was undertaken. The report states that the research into earnings and hours of work covering over 40 large sites showed the existence of great disparities of earnings not only between sites but within the same sites.

Berry notes that at Llanwern 'there was still a considerable range of bonus earnings as between firms'. The CIR study of the

Alcan site states that 'there were big differences in the earnings of employees in the same occupations in different companies and between categories of skill in different companies' (1972:23).

This disparity of earnings within and between sites inevitably led to conflict - the CIR noted that 'we asked workers what comparisons they made when thinking about their earnings, and we found most compared their own earnings with earnings of men in the same trade in other companies on the site rather than with men from their own company on other sites' (1972:25). However, comparisons with other sites were inevitably made. The 1976 NEDO report described the BP site agreement at Baglan Bay as follows :- 'this agreement could have been an important step forward in regulating site relations. However, it failed on this particular site largely because it had to operate at the same time and in the same region as a power station and men on the ethylene project complained of inadequate take-home pay' (p.21). The notes of a 1976 meeting of the Grangemouth contractors' group meeting contain a discussion of the higher earnings possible on a nearby ICI site, and 'the meeting anticipated the trade unions would seek to exploit this'. At a 1974 multi-contractor and multi-client meeting concerning the Teeside area the representative from Sim-Chem Ltd., a client, noted that in 1973 the union FTOs 'had proposed a Teeside and Hartlepool area agreement.... the object was to avoid leapfrogging between competing projects and to restore stability to the area'.

However, while there is evidence of disparity of earnings and leapfrogging bargaining, a simple emphasis on the economic actions of labour standing independently is inadequate. An analysis which embraces the understanding of capital relations developed earlier in the thesis suggests a dynamic in which contractor inefficiency and attempts to generate extra payments give rise to defensive and offensive action by shop stewards and the workforce. This in turn is used by contractors to further loosen client control over them, and this leads to a further step in the lack of strategic emphasis on the production process by the contractor which is manifest in the stress on the incentive scheme as the main instrument of control and planning. In this context, perceiving the contractors' success in bleeding the client, the shop stewards and cabin also seek to increase their earnings by aggressive militancy vis-a-vis bonus levels. Disrupted client-contractor and official union-shop steward hierarchical relationship exist in a dynamic symbiosis.

The Importance of Bonus Schemes

There is considerable evidence that contractors relied very heavily on bonus schemes as the means of control and planning in the production process, and that often they were inadequately designed and run. The co-existence of these two factors inevitably led to considerable problems with regard to the control of labour.

The appendix in the 1970 NEDO report, made up of reports by the

Department of Employment and Productivity, notes :-

'one particular site study sums up much of the difficulties associated with bonus payments. Most management representatives on this site clearly thought that satisfactory output could only be achieved if wages were tied to output through bonus schemes, whereas most worker representatives thought that site bonuses were much too vague and unfair. The difference in approach underlined the suspicions and complete lack of trust between management and men on this site. Despite the many and varied bonus schemes introduced, output was low in almost all cases. There appeared to be some truth in union allegations that management did not have the facilities or expertise to devise and administer fair bonus schemes' (p.103).

Similarly, the study of the Llanwern steelworks' construction notes that few firms did not operate a bonus scheme :-

'about half reported that, by Llanwern standards, they achieved a fair rate of productivity from their employees. This can be explained by better management and supervision. The idea that some firms operate incentive bonus schemes as a 'control' method and almost as a substitute for good management and site supervision.... cannot be readily be dismissed. This is particularly unfortunate for in practice the introduction of a bonus incentive scheme calls for a very high standard of management indeed if such

schemes are to run smoothly. This may well account for the serious labour problems experienced by some managements.... Some firms appear to consider tonnage bonus schemes, with their rough and ready incentives, as providing a sort of 'control system' which should ensure a satisfactory level of productivity being achieved by the men themselves without the firm being obliged to introduce and maintain a high and adequate level of site management and supervision' (Berry, 1963:51-3).

Contractors' heavy reliance on bonus schemes as a substitute for management and supervision is also manifest in the minutes of a meeting at Grangemouth in 1977 between some contractors and BP. Under the site agreement no bonus schemes were permitted. Contractor X was experiencing low productivity and blamed this upon the workforce's lack of motivation. To remedy this situation the contractor proposed to introduce a bonus scheme. Contractor Y, contractor X's managing contractor, recommended increasing staff supervision and argued that the current low quality of supervision undertaken by charge-hands was ineffective. Contractor X 'accepted that there could be some strengthening of supervision but said that their current organisation at Grangemouth would be adequate elsewhere'. Contractor X ultimately agreed to increase staff supervision levels.

Similarly, in the CEGB evidence to the House of Commons Select

Committee it is stated that a common site agreement was not proposed for the Isle of Grain because 'the EEF contractors did not support the proposal; their traditional method was to operate bonus schemes tied to national rates with bonus negotiations at the site' (1981:714).

The Commission on Industrial Relations study also provides evidence on the inadequacy of many bonus schemes :- 'the remaining eleven firms operated incentive bonus schemes.... the work measurement systems used varied from a complex performance index system devised and used by G.N. Haden, to systems where the actual measurement of work seemed vague and haphazard' (1972:14).

Serious inadequacies in the operation of the bonus scheme used by contractors in the Teeside district are clear from the minutes of a 1974 joint client-contractor meeting concerning the Monsanto Seal Sands project:- 'doubts were expressed as to the validity of the area bonus scheme'.

The CEGB also considered bonus schemes to be badly run - Marshall, Head of the Industrial Relations Branch of the Project Management Department of the CEGB, at the 1983 AEU-CS conference, noted that 'most of these national agreements had incentive bonus arrangements negotiated by individual contractors and shop stewards at site. That is all right, perhaps, as long as the schemes are well designed, well administered and viable in their own right. But many were badly designed and many were badly

managed and they led to much industrial unrest'.

There was more than just management ineptitude in the running of a bonus scheme (which was related to the lack of emphasis upon the production process as a profit locus) underlying the focus of strikes around the bonus issue. There existed a fundamental tension between contractors' commercial strategy and their labour control strategy. Given the emphasis of contractors upon generating extra payments outside of the production arena this tension resulted in the contractors' commercial strategy serving to undermine their labour control strategy.

This tension can be seen by considering the effects upon bonus payments of the particular practices outlined in chapter 5 which contractors used in order to generate additional payments from the client. If a contractor is deliberately seeking to obtain extras on day rates by withholding information on poor quality of design the subsequent re-work on day rates will be difficult to standardise to include in a bonus scheme because ad-hoc adjustment of previous work will be unique in nature and because problems of physical access to the work area will arise. Without taking these factors on board in the calculation of the bonus the level of payment will necessarily fall. Although he refrains from discussing contractors deliberately withholding information, a similar picture was drawn by Marshall of the CEGB at the 1983 AEU-CS conference :- 'men trying to strain 8,000 upstanding pipes to meet up with stub heads that have been incorrectly placed - their earnings will suffer and we will get industrial relations

problems. In the past, the first reaction by a traditionally trained client project manager has been to scribble that situation as a problem of industrial relations. These days we do try to research these circumstances'.

The practice of sitting on the job will have an even more direct impact on bonus levels. The essence of sitting on the job is to slow production in order to force the client or managing contractor to issue instructions to accelerate. Clearly a deliberate policy of slowing production by the contractor will impact negatively on the bonus paid to the workforce. The NJC Director, also at the 1983 conference, makes a similar point :-

'there is no point in a client letting a contract to a contractor who says he does not have to be interested in productivity by, for instance, a cost-plus type of contract where it is actually in that contractor's interest not to complete the job quickly, to overrun and to do all those other things and then at the same time say to the contractor 'But you must put in an incentive scheme for the men'. The men will be pulling to do a good and productive job but the contractor's management will not do anything to ensure that they can be productive because that does not meet the contractor's objectives' (also quoted in section 2 above).

In a situation where the contractor has deliberately underbid the above tendencies are likely to be intensified. Further, the

contractor will seek to lower costs by lowering the bonus payments. This aspect should not be overstated. Complaints of this at AEU-CS executive meetings and biennial conferences are noticeable by their absence; the only example from the documentary records is being the delegate who spoke at the 1979 conference :- 'I myself was involved in a dispute at the end of last year when we lost sixteen weeks work only because we were working for a sub-contractor who, by putting in a price which was too low for the work that he was actually doing, tried to make us take a cut in our wages, and we were not having it and we lost 16 weeks'. Although this form seems rare it is another manner in which the contractors' commercial strategies could lie in contradiction to their labour control strategy.

Similarly, it can be seen that in a situation in which a managing contractor is attempting to mitigate problems in the design stage by seeking an acceleration on the construction phase and thus pressurising contractors into building up their labour force, problems in bonus payments will occur. In this situation although an increase in production would occur productivity levels would fall because the nature of problems in the design stage are likely to prevent simple, easily-defined and standardised runs of work. As such, bonus payments will suffer. Contractor C.e. characterised this as 'more men, doing less, looking for more'; the latter phrase referring to a sudden growth in the size of the workforce leading to a perception of a position of strength amongst the workforce. Just as the bonus level drops so the workforce will begin to feel able to demand

more. A similar picture is detailed in the study of the Llanwern steelworks' construction in which it is reported :-

'apart from mis-guided pressure at the time of actual disputes, many firms considered that the client often required excessively rapid build-ups of labour which... frequently provoked almost immediate bonus scheme disputes because the scheme had to be amended with the increase in labour or because the CEU erectors realised the potentialities of the situation' (Berry, 1963:16).

Contractors' commercial strategy meant that bonus payments varied and that this variation was unrelated to effort. This lack of congruence between payment and effort was further exacerbated by the use by contractors of bonus schemes to attract labour in periods of labour shortage - as Marshall of the CEGB noted at the 1983 AEU-CS conference, 'these badly managed schemes were manipulated... sometimes by management, sometimes by men. Why? Either to purchase peace or to ease recruitment problems'. Berry, in his study of the Llanwern works, also notes that the 'shortage of CEU labour at Llanwern in 1961 was seen as significant by contractors in some cases this led to raising the bonus to attract labour from other contractors on site'.

Given the inevitable labour force resistance and conflict engendered by the variation of bonus levels created by their commercial strategy, contractors often resorted to manipulation of the bonus levels in order to 'purchase peace', in the words

quoted above from the CEEB official. This often overt manipulation further undermined the bonus scheme as a crux of a labour control strategy for it further showed to the labour force how far the payments were dependent on often arbitrary management interpretation and definition. This process was manifest at the Monsanto Seal Sands site. At a 1974 joint client-contractors meeting it was noted that 'in those circumstances the bonus scheme tended to be little more than a wage regulator'. At the July 1976 stage three meeting there were discussions concerning a number of walk-offs in support of demands for a minimum bonus level of 93p. The unions blamed low bonus payments on factors outside of the labour force's control such as shortage of materials and unbalanced teams. The contractors argued the low bonus reflected low effort. In October 1976 at a meeting of contractors, FTOs and shop stewards, the union side noted that the origins of a dispute involved 'management changing its mind on the introduction of new norms which had yielded much higher earnings. The unions also complained that the bonus assessment of a contractor 'was made unilaterally by the foreman. The shop stewards should participate in the assessment of bonus'. The contractors replied that 'very often, it had to be said, in an endeavour to create goodwill the men had been treated more generously than output could possibly justify'. At the June 1977 stage 3 meeting the FTOs stated that 'in response to continuing shopfloor pressure and without any consultation whatsoever with full-time officials a further 36p had been progressively injected into the bonus unrelated to increased production.... it was clear that if work continued at the present tempo, which was equivalent

to an earned bonus of around 60p, the men would continue to receive the 36p injection for nothing'. Putting forward a new demand for a minimum bonus of 125p, they stated that 'the contractors had demonstrated that the money was available by permitting a runaway on this scale and it was obvious to the shopfloor that anything they wanted was there for the asking'.

Although there is no evidence on the form of client-contractor relations at Seal Sands it is reasonable, in light of its considerable schedule overrun, to assume that some of the contractor practices outlined in chapter 5 were undertaken on the site. If this was the case, it suggests a dynamic such that the strategies which contractors used to generate extras from the client undermined bonus schemes as tools of labour control, and further that if the practices were successful in generating extras this then allowed contractors to be generous in the bonus payment levels to buy peace because the money came from the client directly, in the form of a 'blank cheque' in the words of the 1981 House of Commons Select Committee (p.45). This then creates a qualitatively different picture than the simple one of economistic militant labour chasing the 'quick penny'.

Client Intervention and Contractor Resistance

The strong links between the commercial arena and the industrial relations arena manifest in issues surrounding incentive bonus schemes suggest that attempts by clients or managing contractors in this period to monitor or control contractors' bonus schemes

should be seen as having a dual purpose - of both tightening commercial control of the contractor, and of tightening control of labour, with the two processes depending on each other.

As such the CEGB's monitoring of the CDN bonus scheme at the Isle of Grain was prompted by more than the industrial relations implications of one contractor on site having far higher bonus levels than other contractors. This is made clear in the oral evidence to the Sizewell B Power Station Public Inquiry by Marshall of the CEGB in 1983 :-

'there has to be an independent monitoring and auditing function undertaken of bonus schemes operated by contractors for a number of reasons. One because we want to do it anyway, so that we are probably getting the right production benefit for the monies being paid out in bonuses.... the site manager has.... to make sure that at the site end the Board is getting value for money through the execution of contracts for the various contractors. So it is a complicated interweaving of responsibilities and events, in which the industrial relations plays a part by activities as well as policies' (day 123, p.37)).

A similar dual purpose was evident in the actions of ICI, a major chemical client, at their Wilton site 1965-66, as described by Portus of ICI at a University of Manchester Institute of Science and Technology symposium in 1970. In discussing the industrial relations problems, in particular the level of strikes, on the

site, Portus describes the client's actions as follows:-

'The first step we took in order to reduce some of the chaos was to tell contractors that if they intended to operate a bonus scheme that the bonus scheme must be related to output.... As time passed, significant variation in the bonus payments made by the different contractors occurred, although these variations were not matched by corresponding variations in output.

Discussion with the contractors made little progress as they generally took refuge in the defence that their commercial interests precluded any disclosure of costs. They were however induced to estimate anonymously a hypothetical job in terms of hours of work and when these estimates were compared it was found that for equal bonus payments the output required ranged between 1 and 4.

At this point it was agreed that a common approach to measurement of output and bonus payments was required' (in Wearne, 1970:31).

The links between commercial control of the contractor and control of labour problems in the operation of bonus schemes were also manifest in the presentation from Shell, a major client, at a 1977 NEDO meeting; 'prior to the mid-60s our experience of bonus schemes was limited to the results of allowing our contractors occasionally to resort to devices to get themselves

(and us) out of trouble'. The client made a deliberate attempt to switch to a more controlled bonus system, requesting a major contractor to introduce a rigorous scheme. This scheme 'was introduced to all other contractors on that site. By the end of 1970, all our other sites with site agreements had either imported the scheme.... or had developed close imitations of their own'. Shell appointed a quantity surveyor 'to act as a fully independent audit group' in order to monitor its operation. Further, 'monitoring the bonus payment, which is sensitive to productivity, enables the client and contractor to identify (and deal with) problems arising on the site, probably more quickly than otherwise'. Importantly, 'the scheme imposes considerable discipline on all concerned with regard to the efficient organisation of work as we all know that poor management of the project will affect the workers' pay packet' and 'one of the main benefits of regular audits is of course that those individual employers who might be inclined to tinker with the bonus scheme, at site level, in order to buy themselves out of trouble instead of confronting the real issues, can be discouraged from doing so, by the other employers and the client'.

There is also evidence of contractors resisting attempts by clients to impose uniformity of earnings, preferring a position of earnings disparity, a position which directly contributed to labour conflict in this period. Contractors resisted for two main reasons. Firstly, uniformity across contractors undermined contractors' strategy of using the payment system as the central tenet of their labour control and production organisation

strategy. Secondly, as intimated above, uniformity of earnings implies a possibility for greater control of clients over contractors. This is because greater client knowledge of earnings implies a greater knowledge of contractor operations which in turn implies a more substantial basis for clients to demand for improved performance.

For the most part over this period, clients were profoundly ignorant of the conditions under which contractors employed their workforce. For instance, the CIR study notes that 'methods of collecting information on pay were not established until several months had passed and the system eventually adopted did not produce figures of any great sophistication or reliability. Earnings levels, for example, were quoted as an average for each company, without any indications of difference in the skill composition of the workforce involved' (1972:26). Even under the comprehensive site agreements introduced in the late 1960s the clients still lacked precise information on the earnings of the employees of the contractors. Despite the attempts to impose uniformity of earnings that these site agreements represented, the reality on site was often very different from the theory of the printed page and sweeping signatures. At Baglan Bay in 1971 the interim report of the contractors' working party into productivity, set up at the client's insistence, noted that there were 'anomalies in the interpretation of the agreement across the site'. The 1976 NEDO report's discussion of this site states that the site agreement 'failed' (p.21).

At Grangemouth in 1978 BP financed the appointment of a full-time co-ordinating chair of the contractors' group. The minutes of a client-contractor meeting shows that 'his main objective was the co-ordination of industrial relations at Grangemouth. The standard site agreement during the past three years of incomes policy had been under considerable pressure on the Grangemouth site and there had been some indications that some contractors (and possibly also a client company) had been 'sympathetically' responding to claims for payments which were not in strict accordance with the agreement'. The intimate links between uniformity of earnings, the increase of information about contractors available to clients, and the consequent implications for greater potential control are underlined in the subsequent actions of this BP-financed co-ordinating official and in the responses of the contractors. The official and BP clearly came to the conclusion that a form of monitoring of the precise conditions under which contractors employed labour was required in order to accomplish adherence to the site agreement and ensure uniformity of earnings. The official wrote to contractors seeking weekly returns on absenteeism, sickness, lodging allowance, abnormal conditions payments, and inclement weather hours. Some weeks later BP also wrote to contractors stating 'that they must supply to the Resident Engineer any weekly returns he requires' and further that contractors 'must allow BP access to their wage sheets and other site records of labour employed under the site agreement'. In interview, the co-ordinating official stated that in response to the audit forms concerning hours and earnings which he sent to contractors, half

of the contractors refused to complete the forms, arguing that such information was 'commercially sensitive'. The contractors argued that given a large part of the job was not cost reimbursable the client had no right to such information. The official countered by saying that the contract they had signed with the client involved a clause stating that they were obliged to comply with the site agreement. The client legal department then added a clause to all existing contracts such that the contractors were obliged to complete the weekly audit forms. In the words of the official this caused 'a bloody furore', but compliance was ultimately achieved. As part of the audit form the co-ordinating official also included a section on productivity, seeking details on target hours for a piece of work against actual hours. The official stated that the contractors were able to successfully resist an obligation to complete this section of the audit forms. Files consulted at the Modern Records Centre confirm that attempts were made to require contractors to undertake a 'productivity calculation' in their weekly returns, but that ultimately this section was dropped from the forms (also discussed in chapter 4.2.)

These considerations allow us to understand the resistance on other sites of contractors to clients', and occasionally, union officials' attempts to impose uniformity of earnings. The CIR study notes that the client engaged a consultant to establish 'a central service to help contractors maintain uniform standards of employment practices.... the activities of GSS [the consultant] met with initial resistance from contractors on the

site . They were asked to provide detailed earnings information and eventually agreed, after discussion in the co-ordination committee, only to supply GSS with copies of wage figures given to the site industrial relations officer.... At the time of our enquiries GSS had not become accepted as a source of advice to contractors' (1972:22). Further, 'when the unions' claim for a site agreement was discussed nearly all the contractors were against the idea', even though the contractors formally 'deplored the disparities in earnings' (1972:26). Also note that it was the contractors who resisted the imposition of a uniform site agreement at the Isle of Grain site. Disparity of earnings was a key element underlying the major disputes at that site.

This discussion has shown the role of capital in creating the context for labour militancy and has highlighted the dynamics of the interactions between the commercial arena and the industrial relations arena. Rather than labour militancy, manifest in leapfrogging bargaining causing schedule delays, a more complex dynamic existed - as is suggested in the wording of the 1971 interim report of the Baglan Bay contractors' working party into productivity (set up at the client's insistence) :- 'the failure to meet programme.... has led to anomalies in the interpretation of the agreement across the site'.

It is pertinent to note that the effective delegation by contractors of management of the production process to the operation of bonus schemes has parallels with Lazonick's analysis of the relationship between the social relations of production

and economic performance in the nineteenth and early twentieth century cotton industry. Lazonick similarly notes that managers in the cotton industry delegated control of the production process in this case to the shopfloor workers :- 'British capitalists preferred to leave considerable control over work organisation with operatives on the shopfloor rather than invest in managerial structures' (Lazonick, 1990:21). Both of these accounts stress the need to look beyond the surface appearance of the coincidence of labour strength/militancy and poor performance and to examine the social relationships underpinning the surface appearance, in particular the role of management in creating or acquiescing in institutions which led to both labour strength/militancy and poor performance.

7.6. Overtime, Shiftwork and Manning

Having examined the main issues of economism it is now appropriate to address issues of work control - namely, overtime, shiftwork, and manning. These three topics are being addressed within one section because they have central relevance to attempts to compensate for previous delays in the project schedule. Once it is clear that a project is behind schedule it is likely that the client and/or managing contractor will take steps to make up for the delay and re-establish the schedule. These steps could involve one or more of increasing manning, increasing overtime and introducing shiftwork. Although it has been established that conflictual labour relations' manifestation

as strikes cannot account for the high level of schedule delay in this period it is possible that labour militancy further contributed to delays by blocking attempts to accelerate to compensate for earlier delays. This section addresses this very question. The pertinence of this question is underlined by the observation made by the 1976 NEDO report :- 'design changes, when they were made on foreign projects seemed to have a less severe effect on the programme' (p.4). 'Delays were rarely made up in the U.K.' (p.16).

Overtime

There is evidence of the occasional use by the workforce of overtime embargoes. However, it is clear that overtime was rarely used in attempts to accelerate production, and as such the opposition to overtime that existed could not be said to have exacerbated problems of schedule delay.

Berry's study of the Llanwern steelworks describes how two firms were subject to a three month overtime ban in support of a demand to increase the bonus level. He also states that it was the majority opinion of the contractors that 'work to rules', 'go slows, and overtime bans were a more important factor at Llanwern in enabling stewards and men to obtain unreasonable and extortionate concessions than strike action' (p.71) (also quoted in section 3). The CIR study notes that 'throughout the period a pattern developed in Peirson and Cleveland Bridge and to a lesser extent in Teeside Bridge of claims which, if not conceded,

were quickly followed by overtime bans, restrictions on output or stoppages of work' (p.7) (also quoted in section 3 above). The minutes of a stage 3 meeting at Baglan Bay in 1971 note that 'welders at Babcock were refusing to start welds which would necessitate work continuing beyond normal working hours'.

Whilst examples of the workforce restricting overtime exist, such a tactic appears to have been occasional. Indeed, examples can also be found of workforce demands to increase overtime - in 1968 at Grangemouth at a stage 3 meeting one contractor reported shop steward demands to increase overtime, and a month later another contractor reported demands for overtime to achieve parity of working hours with the supervision. By the mid-70s even the FTOs were putting forward demands to increase overtime. This occurred at stage 3 meetings in both 1976 and 1977.

This apparently contradictory evidence can be better understood when the control of overtime, rather than levels of overtime per se, is considered.

This consideration feeds into the issue of how far overtime was used to increase production in order to compensate for existing delays. The 1970 NEDO report argues 'we believe constant overtime is not worked to complete programmes on time but arises from the necessity to provide acceptable earnings when the basic rate is 'out of line' (p.43). In 1966 at national negotiations between the EEF and the unions on the Steam Generating Plant Erection Agreement the EEF official stated that overtime had to

be high 'to attract travelling men'. At a stage 3 meeting at Baglan Bay in 1971 an FTO reported that 'shop stewards maintained that the process itself (welding) did not necessitate overtime and that it was being offered as an incentive to chrome moly welders. The FTO understood from the contractor that overtime was not an absolute necessity'. The unpublished NEDO report on two refinery projects 1978-82 reported in relation to the first project that the managing contractor planned to start with a 52 hour week, rising to 60 hours, despite the likelihood that this would prove 'counter-productive'. 'It was never clear whether [the managing contractor] really expected to increase output by excessive overtime or whether the hours were put forward as an (unsatisfactory) means of raising earnings and attracting labour'. At a 1977 NEDO meeting an official from Shell stated that in 1968 'we were faced with the usual state of affairs, slow progress, high overtime, and overmanning.... The overtime had been introduced initially on a controlled basis to attract workers but was eventually escalated'. He argued that increased overtime led to high absenteeism, resulting in an unbalanced workforce which lowered productivity and slowed the rate of progress. The 1968 BP-authored document on the proposed site agreement at Grangemouth notes that 'routine overtime is frequently worked to augment earnings rather than to increase output'.

This suggests that overtime was rarely used to accelerate production partly because of labour's militancy and partly because of contractors' attempts to recruit labour in a buoyant

labour market. This situation complements contractors' commercial strategies in that they are able to put the blame on their lack of acceleration of production onto other parties. It will be recalled that when contractors sit on the job they will seek to blame other parties for lack of progress, forcing clients in to giving explicit instructions to accelerate, instructions which will form the basis for subsequent claims for additional payments.

Shiftwork

It appears from the available evidence that in the 1960s and 1970s shiftworking was occasionally used, but was not widespread. The CEGB witnesses at the 1981 House of Commons Select Committee stated that 'we have... to go into shiftworking. There is great reluctance at this point in time to get shiftworking operating on any major site. There is a bit going on inside the reactors at Hartlepool/Heysham, there is some going on at Dungeness and there is some going on at Dinorwic within the tunnels' (1981:para 2194). Of the seven projects in the 1976 report, shiftworking is described as operating only at two of the sites. The CIR report makes no mention of shiftwork. This is of particular interest in that these two reports examined projects which were subject to severe delays, and it raises the more general question concerning why shiftwork was not extensively used as an instrument to catch up schedule delay.

One possible explanation is that the workforce was able to resist

the imposition of shiftworking. The documentary evidence contains instances of such resistance. At Llanwern, Berry notes that a firm's attempt to introduce a night shift of 30 workers in order to meet urgent programme requirements was met by a 3 month embargo by the AEU until a wage increase was conceded (1963:81). At Grangemouth a 1969 stage 3 meeting considered two instances of the workforce refusing to allow the introduction of a nightshift. At Baglan Bay in 1971, proposals for 'rotating shifts to cover 24 hours, 7 days.... to cater for corrective engineering etc.' were put to shop stewards and rejected. At a stage 3 meeting later in 1971 nightshift was being used by 2 contractors, and the unions advised that they wanted this terminated when the site rundown began.

Whilst there is evidence of the limited use of labour force resistance to shiftworking, there is no evidence of widespread conflict on the issue. The point here is that despite considerable and chronic schedule delays contractors only rarely pushed for the use of shiftwork as an instrument of acceleration of production to catch up delay. A concerted attempt to introduce shiftworking had not yet occurred. Further, it is relevant to note that proposals for the introduction of shiftwork are noticeable by their absence in the recommendations to accelerate production of the contractors' working party into productivity at Baglan Bay. Also, proposals for shiftwork were not a central point of the completion bonus package negotiated at Seal Sands in 1977 in order to accelerate production on a project subject to considerable delay - in contrast other

practices, such as working in the rain, demarcation, and last-in-first-out redundancy criteria were all discussed.

Why were there so few attempts to use shiftwork to accelerate production? The analysis presented in chapter 5 of contractors' strategy to create profit outside of the production process suggests an explanation. The practices of sitting on the job and those associated with a commercial bias scenario have clear implications in terms of a contractor's reluctance to institute measures which will accelerate progress. Also if contractors have underbid they will be reluctant to introduce shiftwork with the necessity to pay shiftwork premia. It is relevant to note here the minutes of a 1974 contractors' negotiating committee meeting concerning Grangemouth :- 'it was further noted that two contractors objected to the use of two shift working on the grounds that the shift working premium would adversely affect their contracts'. Further, the lack of managerial emphasis on efficiency within the production process which this strategy implies also contributes to an explanation. The contractors' resistance to undertake double day shift at Drax power station in 1981, as detailed in the evidence of Marshall of the CEGB to the Sizewell B Public Enquiry' is of particular relevance :-

'The first round reaction we received from our contractors when the implementation or required implementation of double day shift was first raised with them [was dismissive].... in the final analysis the client has to be hard enough to say, as we did at Drax to the boiler contractor, 'You do not start work

on this project until you have got the details of this requirement absolutely worked out', and one has to effect a discipline' (day 123 page 36).

'one has to understand what it [double day shifts] does mean.... in terms of the management expertise involved.... a contractor has to move away from what I would call his 'traditional programme logic' when he moves into the double day shifting area,.... he has to look again at the traditional ways in which he delivers components to the workplace, because it has been double shifted. He has to look again at the way those components are what we call 'furnished' before they are erected in the workplace. He has to look very carefully at the number of working groups which he can double day shift because the number of groups can only equate to the number of parallel paths on the critical path' (day 122, p.83).

In as much as shiftworking requires a higher level of managerial skills and in as much as contractors placed little emphasis upon management organisation of the production process it becomes less of a mystery why the period was characterised by so few attempts to introduce shiftwork.

Again there are parallels between the arguments of this chapter and those of Lazonick on the cotton industry. Here the parallels lie in examining the relationship between the social relations of production and economic performance in terms of management's lack of effort to transform work arrangements. Lazonick explains

that 'Lancashire's cotton businessmen possessed neither the incentive nor the ability to undertake the internal re-organisation of the industry' (1986:20). The lack of incentive lay in the ready ability to create profit in the production process through exploiting the nature of the minder-piecer relationship. The lack of ability lay in the strong union organisation confronting a highly competitive, and highly fragmented organisation of employers. The lack of incentive for the ECI employers lay in their strategic emphasis upon creating profit outwith the production process. The lack of ability of employers in the ECI is more questionable, but employers were certainly constrained by labour militancy, and their own unwillingness to band together, which itself was related to their commercial strategy and their desire to avoid client control. An additional constraint was their lack of managerial skill in the organisation of production, which, of course, is also related to their emphasis on profit outwith the production process.

Manning

Turning finally to issues of manning levels, it is a frequent observation of studies of individual projects in this period that projects suffered from considerable overmanning. The casual observer may attribute overmanning to union strength and militancy, but in the ECI unions had very little role in generating overmanning. Overmanning must be understood in the context of the client-contractor relations. There is evidence that overmanning occurred mainly in two situations - when the

contractor had a reimbursable contract and when the client gave instructions to accelerate production.

The 1986 NEDO report on the 1975-82 Sullom Voe project noted the existence of reimbursable contracts, and also noted that the initial estimate of peak labour force was 1,100, whilst the actual peak was 5,500. The report commented, 'the dangers of overmanning had become part of the 'conventional wisdom' of the ECI. The problems are those of deploying men efficiently and of keeping them supplied with work, information, tools and equipment, and of supervision.... Whilst the problems are well known it is hard for the client to discipline himself. At Sullom Voe this tendency was encouraged by reimbursable contracts' (p,35).

The specifics of the relationship between reimbursable contracts and overmanning are spelled out in the evidence to the Sizewell Inquiry by Marshall of the CEGB :-

'the erection work concerned was being undertaken by the contractor concerned under a lump sum arrangement. This meant with the benefit of hindsight and retrospect that at a stroke of a contractual pen the sanction of managing labour effectively was removed from the responsibility area of the contractor.... if we can just look at the Ince B situation by way of example where one particular contractor overmanned his work, and as is usual in this industrial relations situation the law of diminishing returns applied, and

as he over-resourced his work the amount of production and job progress was almost inversely proportional to the increase in labour resource (day 123, p.34).

Evidence of overmanning in situations where the client or the managing contractor issued instructions to accelerate is plentiful. Given that overtime was used for purposes other than for increasing production, and given that shiftwork was resisted by both labour and contractors, the only option available to contractors whose profit-creating strategy did not entail increasing managerial skills in, and efficiency of, the production process, was simply to increase manning. The NJC Director at the 1983 AEU-CS conference puts this more bluntly :-

'Ask any project management who knows sod-all about it 'What are you going to do about being late on programme?' and he will say 'I am going to double the workforce'. He will be surprised as hell that the work is less with the increased force than it is with the proper force. Over-saturation has a terrible effect on productivity levels'.

The evidence also tends to indicate that increasing manning as a means to accelerate production was often counter-productive.

The 1976 NEDO report notes that 'when things start to go wrong and the contractors resort to putting more men on the site (whether at the client's behest or their own initiative) an intolerable stress is placed on the man management on the site' (p.5). In relation to the Baglan Bay site the report states,

'evidence from the British Ethylene project, where the manning level increased by 100%, was that the attempt proved counter-productive.... the direct effect of high manning is that a much greater man-management is required from site management whose basic expertise is construction engineering' (p.16). The analysis of contractors' profit strategy presented in chapter 5 also suggests that the increased planning and co-ordination as well as 'man-management' required in the production process will be difficult for a management team whose emphasis is to generate additional payments outside of the production process. With the casual nature of employment of even the supervisors, increasing the supervisory manning levels had further deleterious effects - 'this affected the quality of both supervisors and craftsmen employed on the site since the supervision ratios were maintained only by promoting the more reliable craftsmen, who continued to relate more to their workmates than to management' (1976:41). On-site interviews indicate that even in 1991 supervisors continue to hold their union card given the possibility that at the next project they may be 'back on the tools'. Given that explicit instructions to accelerate in effect constitute a de facto reimbursable form of contract, contractors have little concern of the negative effects of overmanning and indeed have an incentive in encouraging it if their percentage management fee will increase as their costs (and manning) increase(s).

This is the context in which to understand the comments made by BP Projects officials to the Baglan Bay contractors' working party into productivity - 'site managers had failed to save BP

from themselves. Pressures are brought to bear from the client to get the job done quickly which usually resulted in the employment of more labour, at no time did site managers warn BP that further recruitment could lead to problems' (also quoted in section 4 above). Similarly, it is the context in which to understand the observation made by Berry of overmanning at the Llanwern works - 'it is a sad comment on management that all too often they did but little to resist the client's demands for rapid build-ups' (1963:29).

The discussion of the Isle of Grain dispute earlier in the chapter also noted that often the pressures to catch-up delays led to thermal insulation contractors being employed on a reimbursable basis. This also led to overmanning, as is indicated in the oral evidence to the House of Commons Select Committee by the Director of TICA :-

'our problem.... is arriving late on sites because of the programming being already behind by the time we get there, and we get the problem that we have to face the suggestion that more men should go on the site and the timescale should be reduced and that creates our problem which, of course, makes the management more difficult' (1981:706).

The unpublished 1967 OCPCA report puts forward two arguments on the disadvantages of overmanning. Firstly, 'efficiency depends upon operatives being able to see ahead and follow through with sequences of repetitive operations but this is

reduced and groups of operatives are confined to smaller scope and areas'. The second argument has a strong anti-labour slant but nevertheless contains a kernel of truth :- 'over-employment takes away the fear of unemployment from operatives and as a consequence of this the power of the union is increased and major unrest follows. The larger the labour force the greater the unrest'. This theme is echoed by Berry in his argument concerning the Llanwern steelworks that 'panic labour build-ups also give the men the impression of an opportune time to press demands' (1963:29). Further consequences of overmanning likely to lead to conflict are suggested in the files on the Baglan Bay project. A meeting in 1971 of the client and contractors noted that the site facilities were 'inadequate for the massive workforce', and the interim report of the contractors' working party into productivity noted that there were complaints of 'road congestion at the start, and the end of the day'.

The dynamics of the way in which labour conflict derives from client-contractor relations and schedule delay and serves to reproduce and exacerbate the situation is highlighted by the argument put forward to the House of Commons Select Committee by the Director of TICA that contracts become reimbursable either, 'when the men press, usually unofficially, for extra payments.... and the client has forced.... or persuaded [the contractor]... to give way', or when 'things are going at a pace that the contractor is able to maintain and the client has said 'more men, more payments'' (1981:705). A picture emerges of a dynamic in which design problems and/or contractor tactics create a delay

which leads to client instructions to accelerate, which is manifest through a simple increase in the labour force and this overmanning leads to labour conflict which is used by contractors to justify arguments for reimbursable contracts, which in turn tend to lead to overmanning.

This discussion of the important issues of overtime, shiftwork, and manning has shown that the extent and significance of militancy varied. Militancy vis-a-vis control of overtime existed, but this was not significant in terms of schedule performance because overtime was rarely used for purposes of accelerating production. The conspicuous lack of either widespread conflict over, or widespread use of, shiftwork was related partly to labour militancy, but more significantly to contractors' commercial strategy. Overmanning was widespread in the period. Whilst militancy arose from this, it did not create it. Vital in its creation were the existence of reimbursable contracts, instructions to accelerate, and contractors' lack of emphasis upon productive efficiency. A dynamic existed in which the labour militancy that existed in these three areas would be used to reproduce the form of commercial relations that underlay the chronic schedule overruns of the period. Evidence on other areas of work control - absenteeism, time discipline and wet weather working - exists. Whilst this evidence does not add anything new to the argument in an analytical sense it does serve to strengthen the empirical basis of the argument. Therefore, it is detailed in appendix 2.

7.8. Conclusion

This chapter has provided detailed evidence on the connections between the commercial arena and the labour relations arena, on how the commercial strategy of contractors contradicted their labour control strategy, on how this and the strategic emphasis of contractors upon the commercial arena as the main profit locus set the material context for shopfloor militancy, and on how this militancy was used by contractors to reproduce the form of client-contractor relations which underlay the severe schedule delays of the period.

Consistently arguing against the simple correlation of labour militancy and poor economic performance, the chapter examined the main manifestations of labour militancy and showed how an adequate understanding of the relationship between each of these forms of labour militancy and economic performance had to embrace an analysis of the role of contractors in setting the material context for militancy and in seeking to use labour militancy to their own advantage in their relationship with clients.

On a number of occasions parallels between the arguments in this chapter and those of Lazonick in his historical study of the UK cotton industry were noted. The key common theme was that whilst labour militancy/strength could be seen to co-exist with poor performance, there was not a simple causal relationship from the former to the latter. To understand this relationship an analysis of the structure and relations of capital is essential.

Further, both Lazonick and this chapter have argued that capital relations lay at the root of poor economic performance. Whilst for Lazonick the key element in militating against a re-organisation of the production process was the fragmentation of capital, for this thesis the key element in poor performance was the nature of client-contractor relations. Despite the differing details, the commonality is the argument that capital relations lay at the root of poor performance.

Moreover, both accounts have argued that labour strength/militancy can only be understood by analysing its material context, in which a pivotal role is played again by the nature of capital relations and management strategy. For Lazonick, the important characteristic is the fragmentation of capital and the managerial strategy of the delegation of control of the production process. For this study of the ECI, the main elements are the commercial strategy of contractors creating profit outwith the production process, and the contradiction that existed between this and the labour control strategy of the operation of bonus schemes.

The implication is that whilst labour militancy/strength co-existed with poor performance both of these elements can be said to have been 'created' by a third element, namely capital relations and managerial strategy. This has profound implications for the (usually neo-classical) approach to the issue of industrial relations and economic performance which seeks to statistically correlate variables such as unionisation

with economic performance outcomes, in that it raises the problem of endogeneity - an issue raised in chapter 2.

Notes

1. An example from the 1980s is used in a discussion of the 1960s and 1970s. This is justified by the scarcity of available evidence and the argument that the process which the example illustrates was more prevalent in the 1960s and 1970s than in the 1980s.

CHAPTER EIGHTLABOUR RELATIONS AND ECONOMIC PERFORMANCE IN THE 1980s8.1. Introduction

Chapter 4 provided evidence of a substantial relative improvement in performance against schedule in the 1980s. Chapters 5 and 6 argued that capital relations lay at the root of poor performance in the 1960s and 1970s and that the main reason for the improvement in the 1980s was the rise of managing contractors and their ability to cut opportunistic practices. The previous chapter showed how the labour militancy of the earlier period, existing in a dynamic symbiosis with contractors' practices, contributed to delay.

This chapter shows that the key areas of labour militancy, both in forms of economism and of work control, fell in the 1980s. It will examine the contours of militancy which were analysed in chapter 7, highlighting the nature of the changes. Therefore, the chapter examines the nature of worker organisation, strikes, bonus and differentials, overtime, shiftwork and manning. A key motif within this is the importance of changes in the industrial relations arena for the commercial arena. This matches the expectations created by the previous chapter. Given that labour militancy was used by contractors to exacerbate and reproduce the commercial relationship with clients which underlay poor performance, so it can be expected that a fall in militancy will

facilitate the managing contractors' strategy of passing on risk and cutting opportunism.

At the same time as mapping out the changes in labour militancy and the effect on performance the chapter will focus on the cause of the fall in militancy. There are three possible explanations for this fall. Firstly, given that a key material context for the labour militancy of the 1960s and 1970s was the disruption to the flow of production arising from the opportunistic practices of contractors and given that managing contractors curbed these practices, this should have an important effect on militancy. Did militancy fall because of the change in material context arising from the fall in opportunistic practices in the 1980s? Secondly, chapter 6 provided evidence that there was a slump in demand and in employment in the industry, with a 46% drop in on-shore ECI employment from 1981 to 1989. Did militancy simply fall away as a result of the change in bargaining power because of the sudden change in the labour market? Finally, in November 1981 a comprehensive national agreement, the National Agreement for the Engineering Construction Industry (the NAECI) came into effect. Was it this that lay at the heart of the fall in militancy?

It is difficult to separate out these strands in that they coincided and can often be seen as mutually reinforcing. The 1970 NEDO report (which effectively constituted the start of the protracted negotiating process leading to the 1981 NAECI) suggests that the NAECI should be seen as having a role

engendering an 'orderly expression of the power structure in the industry' (p.59). This suggests that the NAECI should be seen as having a role engendering such a power structure not only in the industrial relations arena but also in the commercial arena. The importance of the NAECI beyond the industrial relations arena is a recurring theme in the chapter.

Despite the need to be sensitive to the grouping of these elements it is useful to focus on the separate strands, particularly to aid the predictive power of analysis - will the change in labour militancy continue beyond the low level of demand in the industry? One way of separating out the strands is to ask how far the 'successful' negotiation and establishment of the NAECI in 1981 was dependent on the rise of managing contractors and the fall in demand. This can best be addressed after consideration of the political and economic origins of the NAECI in section 2 of the chapter.

The main sources of evidence in this chapter are the records held at the offices of the National Joint Council pertaining to both individual projects, and central, national proceedings and negotiations.

8.2. The NAECI and Its Origins

The NAECI came into effect in November, 1981 and was signed by three employers' associations - NECEA, OCPCA, and TICA - and

seven unions - AEU-CS, AEU-ES, ASBSBSW, EETPU, NUSMWHDE, TGWU, and the GMWU. Subsequently, a treaty agreement was also signed to include the Electrical Contractors' Association and its Scottish sister organisation. The agreement applies to all ECI work except repair and maintenance, and minor modifications. Different institutional and procedural structures apply to 'nominated' and 'non-nominated' sites. According to the text of the NAECI 'the NJC may decide to nominate certain projects'. Nominated projects have an additional document laying down the particulars of site conditions, a supplementary project agreement, and they have a multi-contractor/multi-union site level body, the Project Joint Council (PJC) charged with enforcing the NAECI, and they have an independent auditor to check for compliance. The first stage of procedure is the shop steward/management meeting, the second is the FTO-manager meeting, the third, which only exists for nominated projects, is at the PJC level, and the fourth is at the National Joint Council (NJC) level. The NJC Disputes Committee 'will come to a decision or finding on the issue.... decisions reached by the NJC.... shall be binding on all parties'. The NAECI is a document which details at length the exact substantive terms of employment. The agreement also set up the NJC, made up of equal numbers of contractors' representatives and national FTOs, with an independent Chair and a full time Director, to administer the agreement.

The analysis of NAECI's political and economic origins is best addressed not through a descriptive narrative of the various

stages of the extended negotiating process of eleven years (1970-81), but rather through an examination of the actions and interests of the relevant actors - contractors, managing contractors, clients, trade unions and the state.

This analysis is based on a detailed sifting of evidence concerning the negotiation process derived from NEDO files, a national union official's files, AEU-CS records at the Modern Records Centre, and files at the NJC offices. In addition, interviews with five key actors were undertaken.

Contractors

Given the argument built up over chapter 7 that contractors benefited from the mutually-reinforcing capital relations and labour relations of the 1960s and 1970s it should be expected that contractors and their representative bodies would be reluctant participants in the creation of the NAECI, with its impact on both the labour relations and commercial arenas. The evidence shows that this was precisely the case.

At a number of points during the eleven years between the publication of the 1970 NEDO report's call for a comprehensive national agreement and the signing of the agreement there were impasses at which negotiations broke down. On no occasion did the EEF contractors initiate a return to negotiations. It was often the position of the EEF negotiators in protecting the interests of particularly the smaller contractors which created

such impasses. For instance, in 1978 the EEF sought to resist the addition of clauses relating to an audited uniform bonus scheme to the agreement. Also the EEF successfully blocked an attempt to oblige contractors working on non-nominated sites to return audit forms concerning bonus and earnings information. Ultimately, it took the threat of a breakaway, Ministerial pressure, as well as a change in personnel amongst the EEF negotiators to facilitate the EEF contractors' acceptance of the NAECI. Following an impasse in 1978 the OCPCA entered into informal discussions with some leading large contractors in membership of the EEF to form a new employers' association and immediately sign a new national agreement with the unions. The threat of the loss of a number of leading firms had the effect of pushing the EEF back into negotiations. Towards the end of the negotiations there was a change in personnel on the EEF team. According to interviews with five leading players in the process the official replaced was 'always ready and willing to listen to the smaller contractors'. The EEF official who took over the negotiations stated that he was 'more prepared to ride over the immediate wishes of the obstructors'.

The position of the thermal insulation contractors, as represented by TICA, was similar. On the surface, the widespread labour militancy of the ladders during the 1960s and 1970s, which was at its most visible in the Isle of Grain, should have spurred TICA into an active role in creating a comprehensive national agreement. Their reluctance to be involved can only be understood with reference to how contractors used labour

militancy to their advantage in their commercial relationships with clients. The minutes of 1979 union-OCPCA-EEF working party highlight the reluctance of the thermal insulation contractors to be involved :-

'An employer's representative suggested that representatives of both the thermal insulation employers and the general unions should be invited to a Working Party meeting to acquaint them with their plans for the industry in the hopes that attitudes might be changed.... It was suggested that a letter similar to those sent to the general unions should be sent to the Thermal Insulation Contractors' Association, but an alternative proposal was that at a following meeting.... the unions and the employers should raise the matter with the clients whose support it could be made a condition of contract that on nominated sites thermal insulation work would have to be carried out under [the national agreement]'.

Managing Contractors

The interests of managing contractors were more ambiguous than those of contractors. Their position 'below' clients implies a potential willingness to condone labour militancy in as much as it could be used to deter tighter control and to deflect blame for poor performance. On the other hand their position seeking to control contractors implies a potential need to seek to support the NAECI measures of curbing labour militancy and

facilitating greater control of contractors. Another ambiguity exists in that, individually, managing contractors seek to offer industrial relations expertise as part of their service. This is to say that they compete by seeking to offer better industrial relations expertise than their competitors. Yet an inevitable outcome of the NAECI would be to take industrial relations expertise largely out of competition. This ambiguity is reflected in the fact that although they are grouped in an employers' association, the OCPCA, it is a much looser federation than the EEF/NECEA, with the NECEA Director holding Chief Executive responsibilities, in clear contrast to the role of the OCPCA Director.

The actions of the OCPCA during the negotiating process reflect these contradictory interests. Garfit (1989), a former official of the OCPCA, in his account of the negotiations tends to overstate the role of the OCPCA. His comments that the lack of activity in the negotiations from 1970 to 1976 was largely due to Government inaction - 'it is the respective Governments in these years which failed to improve matters as much as the individual parties' (p.6) - indicate more an attempt at a post-hoc rationalisation than a serious analysis. However, it is also apparent that the OCPCA became more active advocates of a comprehensive national agreement as the decade wore on. This was particularly evident in their attempt in 1978 to form a national agreement with the aid of a breakaway rump from the EEF, an attempt which sought to breach an impasse in negotiations. Yet the OCPCA and its members were also strongly opposed to attempts

throughout the 1980s to widen the scope of the NAECI such that contractors would have to return productivity information in the monthly audit forms which exist on nominated sites.

Clients

The analysis of the preceding chapters has stressed that clients suffered from the system of social relations in the 1960s and 1970s in terms of schedule overruns. As such it should be expected that they would be key advocates of the NAECI as a tool of reform, impacting both in the labour relations and commercial arenas. Once more the evidence supports the expectations based on the preceding analysis.

Whilst clients came to be key advocates of a national agreement, this was not an automatic, immediate process, and indeed it was not a process which embraced all clients. The material interests of individual clients do not necessarily correspond with those that will promote the economic development of the industry as a whole. Individual clients are primarily concerned with the success of their own projects. It is this short-term definition of interests which was often exploited by contractors and the labour force on site in the 1960s and 1970s - a client could be prepared to 'throw money' at a job in seeking to ensure speedy construction.

The role of the clients in the negotiating process reflected these factors in that the clients came to play a pro-active role,

but only once the major long term clients ,i.e. those that needed major plants built on a regular basis, had grouped together in the Capital Projects Client Group (CPCG) in the mid-1970s. The importance of the client role was manifest in 1974 when the unions proposed a joint unions-employers' associations meeting and the EEF and OCPCA only agreed to attend the meeting after they had met with the clients. In 1979 the clients were able to insist on vetting the final employers' association proposals before they were discussed with the unions. Further, (as noted earlier) in 1980 when there was considerable discussion on whether the thermal insulation contractors and employees should be included in scope of the national agreements, it was noted that clients would ultimately be able to insist on it as a term of contract.

The importance of the major long term clients grouping to form another national institution, along with national union officials, able to act on the long term interests of the economic development of the industry is evident in a 1984 letter from a non-CPCG-member client to the NJC Director which states that 'the national agreement prevents clients from taking measures that, albeit costly, would ensure we achieve our objectives.... I agree that the procedures and machinery.... are in the best interests of the industry nationally. However, that does not necessarily satisfy local or individual clients' interests'.

Trade Unions

On the position of trade unions, analysis suggests that the national officials would be advocates of a comprehensive national agreement given that such an agreement concentrated power in their hands, and given their perception of the necessity of it to end the long term economic development of the industry. Further, they were motivated by the traditional labour movement value of egalitarianism. Chapter 7.4. indicated the level of disparity of earnings that could exist even within a large site. There was further disparity between the conditions on the smaller sites and the larger ones. Analysis also suggests that the rank and file members would be unlikely supporters of the NAECI given its implicit support for a reversal of authority within union government and given their short-term, anti-employer definition of interests. Both of these expectations correspond with the evidence.

The national union officials were, in the words of a leading NEDO official, 'the key movers' behind the introduction of the NAECI. Garfit notes that,

'the leadership of John Baldwin [General Secretary, AEU-CS] and Eric Hammond [General Secretary, EETPU] was crucial in achieving the new Agreement. At the meeting on 24 November 1976 Baldwin said that 'the unions had been waiting for the day when the clients became involved'. Following this, his dedication to the 'cause' never wavered.... Eric Hammond said.... the only way to restore authority was for all site matters to be determined nationally'.... it was a

revolutionary doctrine at the time and certainly went far beyond what had been recommended in the 1970 report' (1989:6).

In 1976 when the negotiations were at an impasse it was the General Secretary of the AEU-CS, John Baldwin, who went, along with a NEDO official, to see the Minister of State for Employment in order to seek his assistance in reconvening negotiations. Also at the House of Commons Select Committee inquiry John Baldwin strongly expressed his advocacy of a comprehensive national agreement :-

'I fully support those efforts to reform the industry's industrial relations despite being dismayed at the recent lack of progress caused by prevarications between the clients and the employers' (1981:644).

Evidence on the attitude of the rank and file towards the national agreement clearly indicates that in no sense was the body of union members actively engaged in a campaign for a national agreement. At a negotiating group meeting in 1980 the union official for thermal insulation workers stated that he believed the proposals would need to be put to a 'national delegate conference who he felt would give an emphatic 'no''. This echoes the comment made by the boilermakers' national official at a 1978 negotiation meeting, as reported by an internal EEF note of the meeting, that 'there had never been any genuine enthusiasm from union members on site for a.... national agreement'.

The conflicting approaches towards the agreement of the rank and file and the national officials raise the question of how the national officials succeeded in securing the acceptance of the NAECI. The AEU-CS conference debates on the issue stressed the egalitarian aspects of a national agreement, spreading the gains made by the union members on the large sites to their colleagues on the smaller sites. In a sense the existence of more than one 'rank and file' tended to blur the conflict between national officials and the members (see Gore, 1982 for a discussion of the existence of different 'rank and files'). Secondly, the union officials used methods of bureaucratic manipulation. At the special AEU-CS 1981 conference called to endorse the NAECI the President portrayed the NAECI as an agreement which would strengthen the role of shop stewards :-

'I would first like to dispel the rumours that we are here today to sell out or weaken the shop stewards and democracy of the union. Nothing could be further from the truth.... Here is an opportunity never afforded before in the history of our union for members to play a more significant part in the most important role of their trade union lives, the consultation and drawing up of their annual wages and conditions claim'.

The true significance of the agreement for shop stewards and rank and file was that it would dramatically curtail their power and place them directly under the authority of the official union body. The (mis)representation of the agreement by the leadership was important because prior to this conference the union members

were unable to discuss the precise content of the agreement - at the conference the General Secretary was forced to say, 'I have a responsibility to answer the 64 dollar question that has been posed to the Executive and myself.... What we have not been in a position to do is to report to the membership and to the shop stewards the content of a new national agreement. Why?'. The answer he gave to this question was that there was 'no other possible date other than today in my diary'. The conference passed the acceptance of NAECI with overwhelming support.

No other union called a decision-making conference let alone put the issue to a membership vote. The boilermakers' union called a conference to inform the participants of the Executive decision to sign the agreement. The plumbing section of the EETPU had a consultative meeting for stewards after the national official had reported to the Executive and it was decided that the agreement should be signed. Seventy stewards were invited to attend but only twenty accepted the invitation. Of these twenty, only two supported the agreement. Some stewards attended the meeting with a mandate to oppose the agreement but were informed that union rules precluded the use of such mandates. It is also relevant to note that it was a deliberate policy of the national officials not to involve union members or shop stewards in the negotiating process until a complete package had been settled; a letter from an EETPU national official to area officials in 1980 read :-

'we have made it clear to the employers that we would not be prepared to enter into consultations with our officials and shop stewards in the industry until such

time as we had the shape of the final package. My object in limiting the circulation of this document is because it is in the embryo stage and we cannot afford to have it quoted out of context'.

In effect, this meant presenting the shop stewards with a fait accompli.

The State

Given the fragile nature of national institutions within the industry able to act upon interests coinciding with longer term economic development it was also crucial to the negotiating process to have an outside body also advocating the need for a national agreement. The state, through the neo-corporatist NEDO offices and through the actions of individual Ministers of State, was such an outside body.

The NEDO offices played an important role in securing the national agreement. In a 1981 note, admittedly written by the NEDO offices, for the Director General of NEDO the negotiations are described as an 'EDC-led process'. Garfit also acknowledges the importance of the role of the state by blaming government inaction for the lack of progress before 1976, and further notes,

'it was also significant that Government interests continued, notwithstanding the changes of Government in 1979. Indeed, the new Secretary for Employment.... took a personal interest and he arranged for Dept. of Employment staff to be seconded to the National Joint

Council.... He also continued to give personal backing to Norman Singleton, the Chairman of the Provisional NJC' (1989:9).

In interviews, both a senior EEF official and Labour Secretary of State spoke of the importance of Ministerial 'pressures' upon the EEF to ensure that negotiations restarted, although both declined to clarify precisely the form of this 'pressure'. A private NEDO note of a conversation with the EEF official in 1979 states that the official 'welcomed pressure on the EEF from Minister and Clients, that's the way to get firms to think again'.

This consideration of the origins of the NAECI shows the central importance of the role of union officials, clients and the state. In relation to the discussion in the introductory section of the chapter it should be noted that managing contractors played an increasingly important role in pressing for the agreement as the decade wore on. Further, it should be stressed that the actions of none of the actors seems to have been significantly affected by the fall in demand at the beginning of the 1980s. A proviso here is that the confidence of the cabin in resisting the NAECI may have been affected by the fall in demand.

8.3. Union Democracy - National Official Authority and Representative Democracy

Mapping the Changes

Whilst the 1960s and 1970s can be characterised as decades of cabin power the most appropriate description of union democracy in the 1980s is a decade of the assertion of the authority of the national official union structure. An explicit purpose of the NAECI was to ensure that 'the authority of the official leadership of the unions would be strengthened' (NEDO, 1970:43). Thus, when the General Secretary of the AEU-CS stated at the 1977 conference that 'what we have to do is to restore leadership and authority and negotiating ability back where it belongs and that is with the leaders of the unions' (also quoted in chapter 7.2.), he was giving an accurate description of motivation of the main parties in the negotiating process leading to the NAECI.

There were a number of ways in which the NAECI facilitated this shift in power relations in worker organisation. Most importantly it undermined the material basis of cabin power through its severe circumscribing of the issues about which negotiations could take place on site. Whereas prior to 1981 shop stewards on large sites were often able to secure improvements on issues such as bonus level, abnormal condition payments, and the basic rate, perhaps through control over overtime and shiftwork availability, the 1981 agreement withdrew the legitimacy of site level negotiations on all of these issues. The authority to negotiate on these topics was placed solely in the hands of the national union officials sitting on the NJC. Even the supplementary project agreements which lay out specific issues such as the exact hours of work and times of union meetings which exist for nominated projects affords no

opportunity for a material basis for cabin power as these conditions are negotiated by the local FTOs prior to the workforce coming on site. The 1981 NAECI states that 'the terms of the Supplementary Project Agreement will be negotiated by the main contractors and.... the trade union official' (emphasis added). A 1981 letter from the NJC Director to contractors on Heysham 2 power station site explicitly states that the negotiations should be undertaken by FTOs and not stewards. All of the shop stewards interviewed on sites stated that the local FTO had not sought consultation on supplementary project agreement terms even with the local branches. The five local FTOs who were interviewed gave the same information.

Further, the terms of the NAECI and the supplementary project agreements militate against FTOs and the shop stewards from attending the Project Joint Council meetings with a mandate from the cabin. The PJC meetings are held monthly, and usually later the same week a 'report back' meeting of FTOs to the rest of the shop stewards takes place. In the following week shop stewards 'report back' to their individual cabins. There is, thus, approximately 3 weeks between a cabin meeting and the next PJC meeting. Further, the shop stewards who attend the PJC meetings do not see an agenda of the PJC until the day of the meeting. The timing of meetings and informational flow therefore serve to reinforce the authority of FTOs, and preclude negotiation based upon cabin mandate. The impact of these factors is highlighted by the reported demands in 1984 and 1985 by the union side on Heysham 2 power station PJC for a meeting of shop stewards prior

to the PJC meeting, and by the repeated rejection by the contractors. Of similar significance was the 1990 NJC decision to approve a project's supplementary project agreement subject to the shop steward/cabin report back meeting occurring after the FTO/shop steward report back.

The reversal of the flow of authority is laid out in its barest terms in a 1983 letter from the NJC Director to a contractor on the Easington Gas project :- 'your telex states a decision agreed at PJC has been overruled at the report back meeting. The purpose of the report back meeting is to receive a report on what has already been agreed, and is not an extension of the negotiating process'. This example also indicates that challenges to the reversal of the flow of authority do occur. More dramatically, on a number of major projects through the decade shop steward committees have been formed in explicit defiance of the terms of the NAECI. Whilst there is therefore a degree of uncertainty in the nature of the power relations between the cabin and the local FTOs at site level the key point is that this ebb and flow is played out in a tightly circumscribed area. The NAECI denotes the PJC's main function as 'to operate and maintain the National Agreement, its procedures and the supplementary project agreement'. The role of the PJC as the local institution of enforcement of the NAECI has become more clearly defined throughout the decade such that at site D in 1990 the managing contractor could write to the local FTO concerning the shop steward's role on the PJC :- 'we will require a guarantee from the shop steward representatives

on the PJC that they will neither advocate or participate in any unofficial action and work within procedures in the future'.

Evidence of the very real reversal of authority in worker organisation on large sites can be seen in a number of areas. In all of the records of the seven projects which were examined in detail a recurring complaint from the union side at PJC meetings is that there are too few issues on which 'domestic settlement' is possible. The shift in material basis for the key role of shop stewards and the cabin in the 1960s and 1970s has been such that there is evidence of the growing unwillingness of workers to become shop stewards, of the growing tendency of 'spokesmen' to replace accredited shop stewards. This was recorded in PJC minutes at three of the four sites visited as a cause for concern. This should be interpreted not only as a reaction to the lack of power of shop stewards but also as a reaction against the tightly defined disciplinary role afforded shop stewards by the NAECI. It is noteworthy that two of the shop stewards who were interviewed became shop stewards under the insistence of the contractor's management. All of the management representatives interviewed expressed a preference for accredited stewards over spokesmen. Accreditation can be seen as aiding the process of 'education' concerning the agreement. The importance of the role of the union as an institution in legitimising the process of socialisation into a disciplinary role is underlined in the words of the client industrial relations official at site A who had helped initiate a programme of shop steward training following 'a run of disputes' :- 'it is important to have PJC and

FTO involvement otherwise the stewards will see it as brainwashing'.

The disintegrating worker organisation on site is contrasted with increased contractor organisation on site by a 1984 letter from a shop steward to the AEU-CS General Secretary concerning Torness power station :-

'I have never in all my experience seen us so badly organised at shopfloor level with the older and more experienced men either too frightened or disillusioned to take over stewards' duties and the younger element too frightened of either victimisation or isolation to activate themselves. When you compare this to employers whom I have never seen better organised, with a site IR coordinator supported by on-site representatives of the EEF and pre-PJC meetings of all contractor site managers then I have some fears for our future'.

Reinforcing changes to worker organisation which were connected with the introduction of the NAECI were changes in internal official union structures in the 1980s. The outcome of these changes was that the national officials' area of autonomy of action, action without reference to the membership, was considerably increased. Prior to the full merger with the AEU in 1984 the AEU-CS had a national biennial conference at which 47 delegates attended and debated for a week, setting detailed terms for an Executive Council to follow. Also at the conference

the Executive had to report on its activities and this had to be approved by the conference. The Executive consisted of 8 lay members elected every 4 years by members in particular regions. The General Secretary and Assistant General Secretary were full time officials and were non-voting members of the Executive.

After the merger, the AEU-CS was able to send 13 delegates to the annual national conference of the wider union. The practice so far has been for one or two motions to pertain directly to the ECI, voted on by representatives most of whom have little understanding of the industry. The previous Executive is now entitled a 'National Industrial Council' and is in a subservient position to the National Executive Council of the wider union. The General Secretary of the AEU-CS is the only member of the previous Executive to sit on the Executive of the wider union. The subservience of the National Industrial Council to the National Executive of the wider union as well as the increase in the area of autonomy for national union officials was demonstrated by the attempts in 1987 by the National Industrial Council to dismiss the General Secretary, an attempt which was blocked by the National Executive Committee.

The key national negotiations undertaken by the national officials take place without any obligation of reference back to the membership or a delegate body of shop stewards. In 1981, coinciding with the signing of the NAECI the AEU-CS Executive supported the establishment of a multi-union national shop stewards' committee. The leadership claimed at the 1981 AEU-CS

special conference that this represented a breakthrough in democratic processes. However, the actual level of autonomy of action of the national officials from this body is underlined in the comments made by the union side of the NJC in the midst of the 1982 national negotiations to the effect that if the offer was not improved the officials would call a meeting of the national shop steward committee to reject the offer. Similarly the NJC minutes for 1984 report that the unions stated that they had reported the offer to an acrimonious meeting with shop stewards but that the national officers were prepared to accept the offer. The lack of power of this official shop steward and FTO body is underlined by reports of 'dwindling attendance' in interviews, by national officials, local FTOs and shop stewards. The shop steward at contractor A.f. described it as a 'kangaroo court', while a shop steward at contractor C.d. described it as 'a waste of time'.

This sets the context in which to understand the deep resentment at the nature of union government expressed by the twelve workers who attended an induction presentation at site D at which the author was present as observer. A welder spoke of the present 'cosy little union-management relationship' and contrasted this with the mass meetings held every year at the town hall in Grangemouth in the early 1970s in reference to national negotiations. The existence of these meetings is confirmed by the records on the Grangemouth site held at the Modern Records Centre, Warwick. The coordinator of the induction presentation confirmed that this was a typical reaction to discussions of

NAECI and union government.

When the impact of unions on economic performance in the 1980s is assessed it is important not to make the mistake of making simple conclusions from contrasting the effect of union power in the 1960s and 1970s against the effect of increased authority of national officials. This would be to abstract issues of worker organisation from the wider social relations of the industry and ignore the concept of mutually dependent hierarchies across the commercial and labour relations arenas which was introduced in the previous chapter.

The 1970 NEDO report propounded its concept of the national agreement as an institution to engender 'the orderly expression of the power structure in the industry' (p.59) by stating that a national agreement was required because the authority of the official union leadership would be strengthened' and also because 'it would permit contractors' estimates to be made with greater accuracy, so reducing the uncertainty over construction costs which undermines present client-contractor relationships' (p.43). Whilst the nature of the symbiotic relationship between the commercial and labour relations hierarchies is such that direct surface-level connections are unlikely to be easily visible there are nevertheless a number of specific examples of official union authority being dependent upon a strong willingness by the client or managing contractor to pursue a line of action, perhaps against opposition from the contractors. In 1987 at a project there was widespread shopfloor opposition to the introduction of

shiftwork to catch up delay. The General Secretary of the AEU-CS suggested calling a mass meeting and offered to address the meeting, seeking to overturn the opposition. However, he first of all demanded a 'concrete assurance of client support' before addressing the meeting. Similarly, the union leadership's involvement in the negotiating process for the national agreement was dependent upon strong client involvement. In the sense that the FTO-cabin relationship is dependent upon the stable hierarchy of the contractor subordinate to the managing contractor/client, this points to the important role of the rise of managing contractors and their strategy of passing on risk in contributing to the change in this aspect of labour relations.

The role of the recession on union government is more indirect. The fall in employment and demand in the industry in the decade provided a backdrop both to the ability to impose the NAECI successfully, and to the ability of managing contractors to 'succeed' in their strategy. It can be argued that this backdrop was more important in the latter case than the former. The importance of the recession on capital relations was stressed in the discussion in chapter 6 of the increased 'willingness' of smaller contractors to be squeezed when work is scarce. The impact of the recession upon the 'successful' imposition of the NAECI and the reversal of the flow of authority is likely to have been more muted. The state of the external industry labour market will not have a direct impact on labour relations on site in the sense of directly lowering cabin power. Once employed on site the potential for the cabin's power derives from two key

elements - the fact that there are considerable costs to the client or the contractor of delay - once started, construction will not be halted, capital has sunk costs; and the ability of the union organisation to prevent replacement labour being drafted in a situation where a cabin in dispute has been sacked. The characteristic of high sunk costs is a permanent feature of large site ECI work, and, with the very rare exception such as at the Isle of Grain and the position of the ladders, no such replacement was undertaken or attempted. There is, therefore, a degree of 'insulation' of the site from the external industry labour market. This insulation will not be absolute, however, in that the 'confidence' of the cabin is likely to be informed by the nature of the external labour market. This discussion of the role of the recession on the changes in worker organisation suggests that the authority of the official union structure is not centrally dependent on a low level of demand.

This, of course, is not to say that such a structure of power relations should be regarded as necessarily permanent. As Hyman (1983:61) has pointed out, unions should not be reified, the potential for a reassertion of cabin power continues to exist in other elements of the material context.

Material Context and Interest Definition

The shift in the locus of power from the cabin to the national officials is significant for the purposes of this thesis in that the material context informing the interests underlying union

action are different. Chapter 7 argued that in the 1960s and 1970s a material context of the casual nature of employment, of the inefficient organisation of production, and of the buoyant labour market informed a militant anti-employer, short-term definition of interests which embraced both issues of economism and work control.

The first significant difference in the material contexts of the two periods was in the nature of the labour market in the industry. Chapter 7 provided evidence of the severe slump in demand and in employment levels in the industry in the 1980s. This meant that there was a corresponding reduction in membership levels in the unions which national union officials will perceive as a negative development given their bureaucratic responsibilities of sustaining the viability of the union structure itself. This concern was manifest in the words of the General Secretary of the AEU-CS at the 1981 special national conference called to endorse the NAECI :- 'if the industry dies, the union dies'.

Further, their position within the permanent union structure (in contrast to the casual, short-term site-based position of the cabin) allows the national officials to develop strategies of a longer term perspective.

An additional important difference is that the national officials are less likely to be militant on issues concerning work control. Price (1980) highlights that the greater emphasis on economic

bargaining of union officials is based partly on their position away from the concrete issues of control which derive from the differentiation between labour and labour power and which forms the key material context for the life of the worker eight hours a day, five days a week - what Price terms, removing 'all decision-making away from the workplace and into the formal and neutral procedures' (p.190). It is also based on the economism that is implicit in formalised bargaining and dispute procedures - 'it was the business of this new system to translate control aspirations into pounds, shillings and pence' (1980:151). Chapter 7 pointed out that in the period of cabin power, issues of economism and work control could co-exist through the ultimate ability of the cabin at the point of production to resist any half-hearted attacks by management on areas of their control, regardless of what was stated at the negotiating table. The tacit acceptance of this by union officials in the 1960s and 1970s was absent in the 1980s - what was agreed at the bargaining table was to be enforced on site.

The position of national officials with a strong interest in ensuring high employment levels in the industry makes them possible 'bearers of industrial regeneration' (Higgins, 1987). This is because an interest in high employment levels in the period can be translated as an interest in improved economic performance of projects against schedule in order to attract the siting of marginal capital projects in the UK. Thus, the General Secretary of the AEU-CS wrote in 1981 that :-

'unlike the CEGB and the other nationalised industries

who have little option but to build their plants in the United Kingdom all the industry's other clients are predominantly the multi-national oil and chemical giants who are 'footloose' in the sense that they can select sites from a number of different countries. You may be sure that no Texas oil man feels any obligation whatsoever to provide work for the British construction industry if he can get his plants built more quickly and cheaply elsewhere. It is already established that on the basis of investment decisions already taken the industry is to lose 20% of its jobs in the next two years and at least one international oil company has said that it will never build in Britain again. The only way to reverse this situation is to make the industry more efficient and more reliable' (NEDO,1981:ii).

It is also significant that the client project manager at site C stated in interview that at a recent meeting with the NJC, the Chair of the unions side had vehemently said that 'we are more determined to get this project in on time than you are'.

Given that contractors act upon an interest in profit rather than hitting schedules, and given that clients tend to have an interest in securing their own schedule without regard for the longer term regeneration of the industry, national union officials can be seen to be in a unique position within the industry in terms of the interests underlying their practices. They are the sole key actors whose structural position serves to

define interests with an emphasis of ensuring longer term improvements in performance against schedule.

This is not to say that their practices necessarily had this effect in the 1980s. In particular it is relevant to note that Streeck's (1987) argument concerning unions as a 'strategic contingency' forcing management into organising better economic performance does not depend upon unions defining their interests as exactly similar to those which promote the competitiveness of the industry. Streeck's analysis embraces concerns over the differences between apparent and hidden effects, between the short-term and long-term effects, needed to stimulate better performance. Rather, the force of the above is to pose a key question to be examined in this chapter - namely, if and how the practices of national officials served to improve performance against schedule, both directly and through their impact on capital relations.

8.4. Strikes

Strike statistics were not centrally and systematically recorded by the NJC. However, checking individual project record files at the NJC offices it was possible to compile strike statistics for most of the nominated projects. There was an average of 0.9% of hours lost to strikes on the 18 projects for which data were available. This statistic does not take into account the labour force level on the different projects. The project with the

highest percentage recorded a loss of 2.5%, whilst the lowest recorded 0.02%. Given that all of the projects were subject to a common form of auditing as prescribed by the NAECI it is likely that a common form of calculation was used on all the projects to achieve the individual project statistics.

This average of 0.9% stands in contrast to the average hours lost to strikes on CEGB sites in the 1970s (1970-80) of 3.52% (see Table 7.1.). This of course is not a direct comparison of equivalents given that the figure for the 1980s covers mainly non-power station projects. The two nominated CEGB projects completed in the 1980s lost 1.46% and 1.84% of hours to strikes. They were the projects with the second and third largest percentage of hours lost.

The average time lost on the non-power station nominated projects in the 1980s was 0.81%. It will be recalled that no systematic strike statistics existed for non-power station projects in the 1960s and 1970s.

The above figures suggest that there has been a substantial fall in the level of strikes from the 1970s to the 1980s in the ECI, although the industry continues to be relatively strike-prone. Based on the detailed examination of the records of seven projects, on the on-site research at four sites, and on the examination of the minutes and papers of NJC meetings throughout the decade it is appropriate to state that the strike was the main form of conflict in this period. The records contain only

one discussion of a go-slow or work-to-rule. Chapter 7 provided evidence that go-slows were occasionally deployed in the 1960s and 1970s. Further, there is no instance of the NJC discussing a strike which lasted longer than a 12 day one at Heysham 2. This is significant in terms of its impact on progress against schedule because a longer strike is more likely to have knock-on effects on the work of other contractors and is much harder to speedily make up. All but one of the strikes on nominated projects were unofficial. This represents only a slight change from the previous decades.

What were the reasons for this fall in the level of strikes? The NAECI played an important role in that it promoted a more active policing role by the official union structure. Also, it increased the flow of information concerning strikes and this had an important impact on the meaning of strikes in terms of political economy.

There was an increase in the level of activity of the official union structure in policing and disciplining unofficial strike action. For instance in 1982 a client official at Sellafield wrote to the General Secretary of the AEU-CS detailing the level of disputes on the project and it was the national union official, rather than a contractor representative, who raised the issue at an NJC meeting seeking corrective action. Similarly, in the one instance of a discussion of go-slow the NJC minutes show that the General Secretary of the AEU-CS stated that he had been advised of a restriction of output at a particular

contractor at Drax power station, and that he had arranged for an emergency PJC meeting to be called to deal with the matter.

The increased flow of information surrounding strikes that the PJC meetings create serves to undermine a contractor's ability to divert the blame for poor progress to the labour force. The most obvious manifestation of this came at the project which was discussed in chapter 7 when the NJC set up an expert committee to examine the contractor's claims that the workforce were deliberately limiting production levels. It is highly likely that the contractor's ability to use the argument of labour militancy to re-negotiate terms was somewhat undermined by the findings of the committee that there was no evidence of any restriction of output. This is the basis on which to understand the report of the project given at a NJC meeting :- '(the client) believes a certain major contractor is not supportive of the NJC and is prepared to isolate the site from the NJC. That contractor, according to (the client) has avoided positive NJC involvement in order to enhance their commercial arrangements'. Whilst the appointment of an expert committee in this instance was an extreme example of the increased flow of information surrounding disputes, the forum of PJCs and the lengthy discussions surrounding the more protracted strikes also are part of this process.

The role played by the rise of managing contractors and the consequent fall in opportunism in causing the fall in the level of strikes is also difficult to pin down. Analysis, however,

suggests that this is also likely to be important. The opportunistic practices of contractors were an important element in the material context which informed the labour militancy of the 1960s and 1970s. The curbing (not the elimination) of opportunistic practices in the 1980s necessarily impacted on the material context of militancy in the 1980s.

A possible way to examine the role of the recession on the fall on the strike level is to compare the change in the ECI to the change in the rest of the economy. If change in the ECI is similar to the economy-wide change the support for the argument that the recession had the key impact will be strengthened.

For the whole economy (and without excluding any major disputes), the average number of days lost per 1,000 employees in 1970-80 was 12,788. For 1981-89 this figure is 6,680 (based on Employment Gazette, July, 1990:337). Therefore, in the whole economy, strikes levels approximately halved between the two periods, whilst the ECI strike statistics indicate a drop of around 75% (comparing CEGB 1970-80 average of 3.52% against the average of 0.9% for the 18 projects subsequent to 1981). This perhaps suggests both the importance of the wider labour market as well as the salience of factors above and beyond the recession.

The fall in the level of strikes and use of go-slows in the 1980s is such that their direct negative impact on progress against schedule had significantly decreased. Chapter 7 argued that the

important impact of strikes on performance in the 1960s and 1970s was through their use and meaning in client-contractor relations, such that contractors used labour militancy as a justification to demand reimbursable contracts, to resist tighter commercial control, to deflect blame, and to re-negotiate contractual terms. It will be recalled that direct evidence on contractors using strikes this way will be difficult to find. The words of the industrial relations officer of the managing contractor at site D that 'a better industrial relations climate means that clients are more able to control contractors', suggests that once disruptions to production through labour militancy falls below a certain level it becomes more and more difficult for contractors to attempt to take advantage of such disruption in their commercial relationship with the client or managing contractor. In other words, a form of virtuous circle emerges. Further, the increased flow of information concerning strikes made it more difficult for contractors to use militancy in their attempts to avoid commercial control by the client/managing contractor.

This discussion of strikes in the 1980s has indicated that the direct negative impact of labour militancy on performance has significantly decreased. In the more important arena of its use and meaning in the sphere of client-contractor relations there is good reason to believe that the fall in the level of strikes and the increased flow of information which derive from NAECI structures have had the effect of severely limiting the ability of contractors to divert blame for poor progress on to the labour

force.

8.5. Incentive Bonus Schemes and Differentials

The point was made in the discussion of incentive bonus schemes in chapter 7 that contractors tended to use the bonus scheme as the key element in their labour control strategy. However, not only did they lack the managerial expertise to run an efficient scheme but also their commercial strategy of seeking to generate additional payments through the practices outlined in chapter 5 undermined their labour control strategy. The point was also made that attempts by clients to audit and control bonus schemes served a dual purpose of tightening control over the contractor commercially and in relation to labour management.

A cornerstone of the NAECI is the condition that, if a bonus scheme is to be used, a uniform site-wide audited scheme must be run by contractors. The NAECI states that for an incentive scheme to be operated a number of requirements must be fulfilled. These requirements are that :- 'where incentive schemes are operated there shall be a common nationally agreed cost factor, payment table, which shall be determined by the NJC and shall establish the hourly bonus payment'. In addition NAECI has a provision such that 'the NJC will have an obligation to investigate all instances in which bonus payment levels on nominated projects either fall below that associated with a cost factor of 1.20 or rise above that associated with a cost factor

of 0.55'. Crucially these words are backed by the provision for compulsory independent auditing of the incentive schemes. Examination of the monthly audit reports is a major section of the agenda of every PJC meeting.

The NAECI, therefore, sets constraints for the operation of bonus schemes, constraints upon contractor behaviour which did not generally exist prior to 1981. Further, the imposition of uniformity of earnings (apart from small bonus variations) and the independent auditing of earnings meant that the immediate cause of leapfrogging bargaining was removed. Despite these constraints, disputes over bonus continue to be a major manifestation of the (reduced) labour militancy of the 1980s. Systematic data on the cause of disputes are rare in the project records held at the NJC offices. However, data do exist for Heysham 2 nuclear power station, and for Sellafield chemical/nuclear reprocessing plant. Here, management compiled causes for each dispute and these reports were part of the PJC agenda at each meeting. These figures reveal that bonus issues continued to be an important cause of strikes in the 1980s.

This can be understood when it is recalled that chapters 5 and 6 showed that although opportunism had fallen it was still a common practice, and extras still constituted a key profit locus for contractors. Therefore, the material context of militancy on bonus issues in the 1960s and 1970s, of a contradiction between the commercial strategy of contractors and the labour control strategy of contractors, still existed, albeit in a less

severe form than in the earlier decades. This meant that bonus levels often continued to be unrelated to production levels, and therefore continued to form a clear focus for (reduced) cabin power.

Within much more tightly circumscribed limits than existed in the previous decades, manipulation of the bonus scheme still occurred as did the clash with the contractors' commercial strategy. The manager at contractor C.i. stated that the bonus had been kept 'artificially high for a while' following a series of disputes over previous low bonus yields which had been related to 'problems with material supply and late detailed drawings'. It is also relevant to note that this is the contractor whose management boasted that 'our backroom boys are exploiting every avenue', i.e. this is a contractor whose commercial strategy emphasised the generation of additional payments from the client. It was this commercial strategy as well as design and delivery problems which undermined the strategy of labour control through the bonus scheme.

The project manager at contractor C.f. stated that the stewards had come to him and demanded a bonus yield of £2.20 whilst a large crane was on site, this crane having been hired for a limited period. The manager stated that he had replied that he would give 'favourable norms if things went OK for this period'. The manager at contractor C.d. hit a common note when he stated that 'walk-outs over bonus still occur. After a testing period you find out a norm and you find ways of meeting that norm'. It

is also significant that the NJC powers of investigation at the lower and upper limits of payment levels have never been invoked, because contractors have never breached these limits.

The more tightly circumscribed nature of this use of the bonus scheme is highlighted by the discussion at a PJC meeting at site C concerning the bonus payments made by a contractor. The auditor's report highlighted irregularities in the calculation of the bonus payments. The PJC asked the contractor to explain this situation at the following meeting.

The relevance for economic performance of the NAECI provisions on ensuring uniformity of earnings through independent auditing stretches wider than simply their impact on labour militancy. The auditing provision prevents the use of other payments 'to buy peace' and the use of other payments to increase earnings in the short term as part of a labour control strategy. In addition, the audit form supplies the client with complete information about the amount of money which the contractor uses on labour costs, and therefore also allows the client to see how much of the tender price and extras is retained by the contractor for non-labour costs. This increased flow of information available to the client implies a greater opportunity for tighter commercial control.

Expressed in these terms it is apparent that it could be in the short-term interests of the workforce and contractors on a site to seek to avoid the auditing provisions of the NAECI. The

auditing provision applies only to nominated projects, and not to non-nominated projects. Although the NAECI states nomination is decided upon by the NJC, the de facto situation is that the client has the power of veto. In this regard it is relevant that the client will consult with the contractors hired for the project whether nomination should occur. This allows us to understand the comments made by the NJC Director at a 1989 NJC meeting concerning a large non-nominated project. The minutes of the meeting report that the NJC Director stated that 'months had been added to the schedule and he suspected that the absence of appropriate contact with the NJC may well have occurred because both employers and workforce had in their different ways been exploiting an inexperienced client'.

It is not only contractors who are tempted to increase earnings in the short term as part of a labour control strategy and as part of a process of acceleration, but also clients, as is shown in a 1984 letter from a client to the NJC Director concerning two projects which had suffered from delays :-

'The national agreement prevents clients taking measures that, albeit may be costly, would ensure we achieve our objectives.... I agree that the procedures and machinery.... are in the best interests of the industry nationally. However, that does not necessarily satisfy local or individual clients' interests.... Better management would improve the situation but without incentives and particularly without a commitment to the national agreement, the

men's attitudes and hence productivity will not improve' (also quoted in part in section 2 above).

The examination of the effect of the NAECI bonus provisions on economic performance must also embrace issues beyond the immediate impact on labour militancy. In particular, have the NAECI provisions forced management into running better schemes? This possibility is suggested by the argument put forward by the General Secretary of the AEU-CS at the 1981 national conference called to endorse the NAECI that contractors 'are going to be trained to manage, and if it is necessary I will train them to manage.... If it means a trade unionist has got to educate management so be it'. Further, two contractors (A.e. and C.h.), in interview, argued that the 'PJC/NJC limits and regulations on bonus schemes forces management to run a better scheme' (contractor A.e.).

However, against this, the evidence discussed earlier on the continuing manipulation of bonus schemes with payment often at levels unrelated to production levels, and the evidence in chapter 6.11. on a leading contractor's continuing lack of precise measuring of work undertaken suggests that there has not been a major change.

It is legitimate to argue that whilst the NAECI provisions on bonus schemes have narrowed the scope for manipulation of the bonus scheme, contractors' continued emphasis on extras as a key profit locus and the remaining cabin power have meant that it is

unlikely that there has been a major improvement in the design and operation of bonus schemes.

The sum of this discussion of changes in incentive bonus schemes and differentials in the 1980s is that tighter limits, auditing, and the reduction in opportunistic practices have contributed to a fall on militancy on the issue. This fall in militancy will have impacted positively on performance against schedule both directly and indirectly through the increasing inability of contractors to blame militancy for delays, thereby evading commercial control. Besides this fall in militancy the NAECI provisions directly provide the managing contractor with greater information on the financial operation of contractors, thereby implying greater commercial control. However, it is unlikely that the NAECI provisions led to a substantial change in the use and quality of design and operation of bonus schemes.

8.6. Overtime, Shiftwork and Manning

Chapter 7 argued that an important reason for the chronic schedule delays of the period was the inability of projects to make up delays; rather, delays tended to compound themselves. The role of labour relations in this was examined in relation to overtime, shiftwork and manning and it was argued that the key feature of the period was the lack of serious attempt to introduce shiftworking to catch up delay. This was related to

the commercial strategy of contractors. This section examines the role of overtime, shiftwork and manning in the substantial relative improvements in the 1980s.

Overtime

Overtime in the 1960s and 1970s was rarely used in order to catch up delays, rather its primary functions were ones of attracting labour in periods of a buoyant labour market and of serving to increase earnings as part of a labour control strategy. The essential picture of overtime in 1980s is that initially it was severely limited such that it was available on occasion for contractors to make up delays in 'emergency' situations. As the decade wore on and as the labour market tightened it once again came to be used as an 'earnings regulator', in the words of a national union official at a 1989 NJC meeting.

The provisions of the NAECI state that 'the NJC believes that regular overtime is not in the Industry's interests.... However, there are occasions where the work pattern of a particular project may require systematic overtime working which shall be allowed.... Any overtime.... shall not normally exceed 30 hours in any consecutive 4 week period with not more than 2 Sundays worked in each 4. When overtime in excess of these levels is anticipated then prior application for approval shall be made to the NJC''. What occurred in practice, in the words of the NJC Secretary at a 1988 NJC meeting, was that 'PJC's were responsible

for co-ordination and control of overtime application unless overtime in excess of 30 hours or systematic overtime was required'. Overtime approval became a regular item on PJC agendas and any overtime to be worked had to be applied for in advance to the PJC. In addition the PJC inspected the audit forms which showed the amount of overtime worked.

The initial impact of these provisions was a strong curtailment in the amount of overtime worked. Whilst in 1981, British Nuclear Fuels could say to the NJC that contractors were working 'more hours than desirable', the situation had changed such that in 1982 the PJC at the same project could feel able to refuse a contractor's application for overtime because there was insufficient evidence of the emergency requirement for it. A gradual loosening of control occurred, so that by 1985, on the same project the union side of the PJC 'expressed the view that BNFL were increasing their overtime requests for allegedly urgent work', and stated that there was a danger of such requests becoming 'routine'. In 1987 the PJC expressed grave concern at the overtime growth, and in 1989 the NJC Director stated at an NJC meeting that the NJC had to 'face that virtually all major projects were now working considerable overtime'.

The curtailment of overtime in the early years of the NAECI had a number of effects relevant to economic performance. Firstly, it allowed for an easier introduction of shiftwork in the sense that it lowered workforce resistance to shiftwork in that shiftwork no longer represented an attack on the opportunity for

overtime and the ability of workers to regulate their earnings and hours through absenteeism and overtime. Further, contractors could no longer use the argument of labour force resistance to justify the lack of shiftworking, an organisation of production which, as chapter 7 showed, contractors were reluctant to introduce. Secondly, given that overtime was no longer an earnings regulator it was now available to be used for the purposes of increasing production in order to catch up delay. Reliable evidence for this is difficult to establish in that part of the movement towards the use of overtime as an earnings regulator was clouded by contractors (and clients) using the language of emergency and delayed schedule in order to justify their use of overtime. It is, therefore, hard to judge the claims of, for instance, the client's presentation at a 1987 PJC that the project was 2% behind schedule and that therefore weekend overtime was to be started. It does, however, appear legitimate to argue that in the context of the curtailment of overtime in the earlier years of the NAECI overtime was available for catching up delays, and was occasionally used for this purpose. Further, the ability of the cabin to enforce an embargo on overtime, which was a tactic of the 1970s, was severely limited by the reversal in the flow of authority which occurred in this period. For instance, the overtime ban imposed on a 1983 project was soon ended through a combination of the local FTO pressuring the workers and through the threat and ability of the contractor to speedily push the issue through the dispute procedure to the national level.

To understand the relationship between overtime and performance against schedule it is also necessary to examine how the use and meaning of overtime between the early 1980s and the end of the decade changed. The key reason relates to the changes in the levels of demand and the labour market in the industry. The industrial relations officer of the client at site B stated that systematic overtime was being used because of the need to recruit labour against the competition from nearby site D and other projects. In 1990 the union side stated at a NJC meeting that high overtime was being used to attract labour, with the project at St. Fergus working 2 hours more per week than the project at Mossmorran. This must be related not only to increases in investment in the industry but also to the inability of the industry to reproduce the skill levels of the workforce.

Further, the move towards unrestricted overtime highlights the limitations of the power of the national level institutions. A contractor official at a 1990 NJC meeting stated that 'the facts were that the NJC simply did not have the power to dictate that overtime should not exceed a certain level. If applications for dispensations were not granted the flow of applications would simply dry up'. A greater control of overtime was only possible in the earlier part of the decade because of the conjunctural opposition of local FTOs to the use of overtime based on high unemployment among members. The FTOs on the Easington project stressed at a 1983 PJC meeting the need to limit overtime because of the very high levels of unemployment. As the level of unemployment in the industry fell the local FTOs felt less

able to constrain the demands of the workforce and some clients to work more and more overtime.

Such a change in the use and meaning of overtime impacts negatively upon performance against schedule. Firstly, overtime can no longer be used to catch up schedule delays. More importantly, it may endanger the use of (the more effective) shiftwork. This has occurred not only due to labour force resistance but also due to contractors using the argument of labour force resistance as part of a commercial strategy of resisting client control. This is established in the discussion immediately below of shiftwork in the 1980s.

Shiftwork

Shiftwork was rarely used to catch up delays in the 1960s and 1970s. This was due to the resistance of the cabin and the resistance of the contractors. The resistance of the contractors was related to both the practices associated with their commercial strategy and the low level of managerial skills in relation to the organisation of production.

In the 1980s shiftwork was used extensively. Given that there was a considerable improvement in performance against schedule it is likely that shiftwork was also used successfully to catch up delays. A 1983 paper on double day shifting written by the NJC office stated that it had been operated very successfully at Drax power station :- 'despite significant delays to the

commencement of mechanical and electrical construction, the commissioning of the first unit is still on programme for completion on the original project dates - an achievement that would not have been possible without double day shifting'.

Shiftwork has also been used extensively to shorten schedule lengths. The increasing reliability of the availability of shiftwork has allowed clients and managing contractors to build it into their schedule planning. British Steel's blast furnace project at Redcar and the ICI Wilton project operated rolling 24-hour shift systems. These projects had their particular forms of shiftwork written into the supplementary project agreements negotiated with local FTOs often under strict guidance from the national officials, and signed before the arrival of the workforce on site.

The NAECI and the national officials had a key role in not only breaking down the resistance of the labour force but also breaking down that of contractors. The NAECI provisions state that 'all employees are engaged on the basis that they will undertake double day shifts or three shift working, rotational day shift or night shift working, in accordance with this agreement'. The opposition of the workforce and the manner in which the NAECI served to channel this opposition away from manifesting itself in the form of an embargo on shiftworking is described succinctly in the 1983 NJC paper on double day shiftworking :-

'virtually no time has been lost through shiftworking-

related disputes.... unfortunately this does not signify that double day shiftworking is without problems as there have been a number of references into the dispute procedure. These have been related to prescribed shiftworking hours and rotation periods but tend to signify a general resistance to the concept by the employees concerned'.

The existence of the NAECI and the altered power relations within worker organisation allowed a resistance to shiftwork to be channelled through specific grievances about the details of the implementation of the shiftwork.

This lack of an outright embargo from the workforce meant that contractors could no longer use the argument of potential labour force resistance to justify their own reluctance to undertake shiftwork. In an action which set an important precedent for the decade the NJC and the national union officials played an important role in supporting the CEGB at Heysham 2 in its determination to make a contractor and the contractor's workforce operate on double day shifts. The minutes of a 1982 NJC meeting highlight this in that the NJC criticised the contractor for 'offering to the workforce overtime on Sundays as an alternative to double day shiftwork' which had been embargoed by the cabin. In an interview with a management official employed by the contractor employed at Heysham 2 in 1982, the management official stated that the CEGB pushed the managing contractor to push the contractor to operate double day shifts. The contractor had entered the tender bid without an expectation of working double

day shifts and was 'uncomfortable commercially' about being pressured into this form of shift operation. The importance of the contractor's commercial strategy in their resistance to undertake double day shiftworking is also strongly implied by Morris and Hough in their description of this instance :- 'shortly afterwards, [the contractor] introduced double day shiftworking.... this met with resistance from the workforce. Poor productivity was compounded by an under-estimation of the work required to be done and by under-resourcing' (1987:26/7). In effect, this is implying that the contractor underbid. The action of the AEU-CS General Secretary in writing to the local FTO stressing that whilst the issue was going through procedure it was the right of management to introduce shiftwork ensured that the contractor could not successfully use the argument of labour force resistance to justify failing to introduce the shiftwork.

The change in the use of overtime in the decade and the tightening of the labour market has meant, however, that contractors are increasingly once more able to use arguments concerning labour in order to enhance their commercial arrangements with clients. In interviews, two client industrial relations officials at site A stated that the managing contractor on a sub-project seeking to 'rush the job' insisted that their main contractors work extensive weekend overtime. On the main project the contractors argued with the client that because of this they were coming under pressure to do away with double day shifting (introduced in 1990 in order to catch up delays). The

client officials stated that some contractors wanted to cease working double day shifts in order to improve their position commercially in that they could argue that the continued delay against schedule was due to the labour force militancy rather than due to any failing of their own. The client believed that the schedule of the main project needed double day shiftworking. Rather than acquiescing, the client pressured the managing contractor on the sub-project to control the use of overtime.

A similar though less clear-cut scenario was played out on site C. This project was planned with the predominant use of double day shiftwork on the mechanical and electrical engineering section of the project, i.e. on the section of the work covered by the NAECI. However, as the labour market in this area of the country tightened, the bonus earnings of the workers operating under the civil engineering working rule agreement grew substantially. This led to the ECI contractors at a PJC meeting proposing to relinquish double day shifts 'because of the need to match civil earnings'. The union side agreed with this proposal. At a subsequent meeting between the NJC, the client and the joint chairs of the PJC the only dissent to the proposed abandonment came from the national union officials who argued that overtime led to absenteeism and low productivity. Ultimately, the NJC endorsed the proposed change from shiftwork to a working week encompassing 10 hours overtime to give higher earnings. That contractors could stand to benefit commercially from such a change is indicated by the minutes of a PJC meeting in which the contractors' side is reported as stating that, 'if

the working pattern was changed without full client support and things went wrong, the consequence for contractors would be serious'. This is in effect creating a justification, based on fault outside of the contractors' control, for failure to meet schedule dates. It is also noteworthy that it was the contractors who first raised the proposal to drop shiftwork.

Manning

In relation to manning, chapter 7 argued that, given shiftwork and overtime were not available to catch up delays, overmanning was the inevitable consequence of the inevitable instructions to accelerate on the 1960s and 1970s combined with the lack of emphasis of contractors on productive efficiency. In the 1980s overtime was available in the early years and shiftwork was available throughout. It is thus to be expected that overmanning should correspondingly have been much less prevalent in this period. Similarly the shift from the 1970s reimbursable contracts to the fixed fee approach and the strategy of passing on risk in the 1980s, as described in chapters 5 and 6, should encourage a drop in the frequency of overmanning.

These expectations are supported by the evidence in that in all the sources on the 1980s consulted there were only two pieces of evidence indicating overmanning. The project which had severe fabrication shop problems, as described in chapter 7.3., had originally planned a peak labour force of 250, whilst in reality the labour force peaked at 350. Secondly, at site A at a 1990

PJC the contractors stated that the 'project was already 20% over the peak workforce projections' and that recruitment continued. Given that both of these projects were subject to severe delays it is apparent that overmanning continues to be associated with poor performance against schedule.

The fall in overmanning should also be related to the increased use of off-site fabrication of large structures, or Pre Assembled Units (PAUs), structures which in earlier years would have been undertaken on site. Two management officials involved with the A5 plant at Hull in the mid-1980s, one from the client and one from the managing contractor, stated that the decision to rely heavily on PAUs was conditioned upon the fear of a repeat of the high level of shopfloor militancy which occurred on the A4 plant in the same area in the previous decade. PAUs had the effect of substantially reducing the number of workers on site. In the words of the managing contractor official, 'the idea was divide and rule', with the strength of the more militant on-site workers reduced due to their smaller numbers. Similarly, files at the NJC indicate that a named project's heavy use of PAUs had also been informed by the desire to avoid shopfloor militancy by lowering shopfloor numbers.

The use of PAUs extends beyond these two projects and has been informed by other perceived benefits than the avoidance of shopfloor militancy. PAUs were used extensively on site A. The client project manager argued that their use was experienced by

simple cost benefits. In addition the use of PAUs implies the necessity for a firmer design at an earlier stage. Given that there are greater opportunities for contractors to generate additional payments in situations where the design is subject to change the use of PAUs can be seen to have this additional advantage. PAUs, thus, have benefits to clients in both the commercial arena and the labour relations arena. The nature of this advantage is such that the increased use of PAUs represents a sustainable and important improvement in economic performance. However, PAUs also serve to cement the division between design and construction, a division which needs to be broken down for longer term economic development.

This examination of overtime, shiftwork, and manning has stressed the importance of the NAECI and the reversal in the flow of authority within worker organisation in allowing for the use of effective methods to accelerate production to make up for delays, methods which were not used in previous decades. This was described in terms of the impact of these factors in both the labour relations and commercial arenas. An important theme was that as the decade drew to a close and the labour market tightened, the ability to ensure control of overtime and shiftworking was put under pressure and showed signs of strain.

This discussion of the causes of change shows not only the separate causal significance of the NAECI and the labour market, but also the importance of their interaction. For example a key

element in the client being able to force the contractor at Heysham 2 in 1982 to undertake shiftwork was the severe shortage of work for the contractor, but the method by which the contractor was forced to introduce shiftwork relied heavily on the NAECI and the NJC. Evidence on absenteeism, time discipline and wet weather working in the 1980s is detailed in appendix 2. Whilst the evidence is less conclusive there appears to have been some change in absenteeism and wet weather working, though less in time discipline.

8.8. Conclusion - Summary of Changes, Causes and Effects

The examination in this chapter of the worker organisation and those contours of labour relations which were important areas of labour militancy in the 1960s and 1970s has shown that there have been substantial changes in labour relations practices in the 1980s, but also that there has been a significant measure of continuity. Perhaps the most fundamental change came in the nature of worker organisation, with a shift in the locus of authority toward the national official union body and away from the cabin. The examination of strikes, although based on far from adequate data, suggested that while there had been a fall in the level of strikes, and the length of strikes fell away, relative to other industries the ECI continued to be strike-prone. The operation of bonus schemes had not changed fundamentally, although their manipulation in the 1980s was within much tighter limits. The nature of overtime changed in

the early part of the decade but at the end of the 1980s it appeared to be reverting to its form in the 1970s, i.e. widespread in order to attract labour. Shiftwork was used extensively in the 1980s, unlike in the previous decades, and consequently situations of overmanning were far less common. Evidence on time discipline, absenteeism and wet weather working (detailed in appendix 2) was less conclusive, although it appeared that there had been some change in absenteeism and wet weather working, though less in time discipline.

An analysis of whether these changes can be legitimately characterised as representing a 'sea-change' in labour relations practices must be based not only on a mapping-out of the extent of the changes but also on an understanding of the causes of the changes.

In each of the sections of the chapter attempts were made to examine the prime causes of the changes identified in labour relations practices. The introduction identified three possible explanations for the changes - the curbing of contractors' opportunistic practices, the slump in demand in the industry, and the introduction of the NAECI in 1981. It was stressed that given the elements coincided it would be difficult to identify the relative impact of the separate strands. The NAECI played a significant direct role in the changes in worker organisation and shiftworking, but it was also argued that the context set by the recession and the fall in opportunistic practices played important facilitative roles in these cases. Further, the

independent roles of the NAECI and the managing contractor strategy of curbing opportunistic practices are hard to assess in that they are interdependent. They are interdependent in the sense that the terms, and not only the effects on labour relations, of the NAECI contribute to a change in commercial relations, the curbing of opportunistic practices. NAECI terms which have this impact are the increased flow of information concerning strikes, and the increased knowledge of the contractors' labour costs that necessarily derive from the existence of the NAECI. The supportive interdependence of the two elements suggest the changes in labour relations practices may outlast the recession. This point is strengthened by the argument that the central origins of the NAECI lay separately from the rise of managing contractors and the fall in demand.

The effect of the changes outlined above on economic performance have been such that they have contributed to a relative improvement in performance against schedule. None of the major changes in labour relations outlined in this chapter stem from a major push by contractors towards increasing the efficiency of production. This tends to confirm the argument developed in earlier chapters that there has been no fundamental change in productive efficiency in the decade.

The positive impact of the changes on schedule delay not only derive from cutting labour militancy, but also from the way in which these changes have tended to prevent contractors from deflecting blame on to labour as part of their tactics

accompanying practices which slowed production and generated additional payments. Further, as mentioned above, NAECI provisions, themselves, have directly facilitated the greater commercial control of contractors.

CHAPTER NINECONCLUSIONS9.1. Introduction

It is worth recalling the train of argument which underlay the definition of the terms of the thesis. At an abstract level it was considered that the academic study of industrial relations was undergoing crisis and that the most useful reconceptualisation of the subject was as a study of the political economy of production. The aim of this thesis was to contribute towards such a reconceptualisation by engaging with the debate concerning the effects of trade unions upon economic performance at the micro-level. The mainstream debate focused upon trade unions partly for reasons of a directly political nature, and it was argued that theoretically a more useful approach was to examine the relationship between industrial relations (rather than just trade unions) and economic performance. To explore issues of causation and process within this it was necessary to undertake a detailed processual case study of a particular industry.

The ECI from 1960-90 was chosen because it displayed variation in both industrial relations and economic performance, because it constituted a crucial case for the thesis that the militancy of labour lay at the root of the UK's poor economic performance, and because its organisation of production and form of capital

relations could be seen as prototypical in the reconstitution of production in advanced capitalism.

This conclusion seeks to draw out the implications for these issues from the substantive findings of the research. The second section of the chapter reiterates the main substantive findings contained within chapters 4 to 8. The third section discusses the relevance of these findings for the debates concerning research methods. The fourth section examines the implications of the findings for the argument that the ECI constitutes a prototype for the reconstitution of production in advanced capitalism. The chapter ends with a discussion of the relevance of the research findings for the argument that labour militancy lay at the root of the UK's poor economic performance.

9.2. Summary of Main Findings

Economic Performance

Chapter 4 provided evidence that there had been a marked improvement in performance against construction schedule between the 1960s and 1970s, and the 1980s. The main sources of the data were the NEDO reports of 1970 and 1976 and the NEDO/NJC report of 1988. These reports were examined for potential bias which would serve to strengthen the expected relationship of improvement in economic performance between the two periods. The 1988 report was shown to be an important source of such bias.

Screening of the data for the 1980s was therefore undertaken, and this served to minimise the systematic bias. Using the screened data, analysis showed that the relative improvement in performance was such that whilst in the 1960s, 83% of projects were subject to delay, in the 1980s, only 15% of projects were, and whilst in the 1970s, the mean schedule delay of projects was 39%, in the 1980s it was reduced to 7%.

It was stressed that performance against construction schedule was not a measure of economic efficiency defined in technical terms. A strength of this measure was that it addressed issues of non-price competitiveness. It was primarily an extensive measure relevant to clients which partly reflected their ability to ensure that contractors and their labour forces performed to the terms of the tender bids. To clients, overruns were seen as costly and as constituting poor economic performance.

The chapter also noted the lack of data in the industry concerning productivity outcomes. There had been an attempt to create a data bank of such measures but this had been blocked by contractors and managing contractors. This was a clear example of data creation as a political process.

With an understanding of the political-economic meaning of the data on performance the task was set to explain why the 1960s and 1970s were characterised by poor performance against schedule, and why the 1980s witnessed a relative improvement in performance against schedule.

The 1960s and 1970s

The sum of the research and arguments presented in chapters 5 and 7 is that the root cause of the poor performance in the 1960s and 1970s lay in the nature of capital relations, in particular the 'opportunistic' practices of contractors. Chapter 5 demonstrated that the interests of contractors differed from those of clients and that in the 1960s and the 1970s this manifested itself in practices which impacted directly and negatively upon performance against schedule. These practices were discussed by examining 'extras/on day rates', 'underbidding', 'sitting on the job', and 'withholding information/commercial bias scenario'. In essence, the contractors were able to covertly and deliberately delay construction thereby forcing the client into offering extra payments in order to attempt to accelerate production. A key profit locus of contractors lay in exploiting opportunities to generate additional payments.

Chapter 7 showed that labour militancy was widespread in the period and that the locus of power within worker organisation was the cabin. The material context informed a militant, anti-employer, short term definition of interests at the cabin level. An important element in the material context informing these interests was the commercial strategy of the contractors. In particular, the use of the bonus scheme as a key method of labour control lay in contradiction to the practices of contractors in deliberately slowing construction. Contractors would

occasionally foment strikes, though more often they would use strikes as an opportunity to secure financial gain in their commercial relationship with clients. The cabin militancy did not push management into altering their profit strategy.

The cabin militancy of the period exacerbated poor performance and was used by contractors to continue to evade commercial control by clients. It is not useful to attempt to attribute a percentage of poor performance to labour militancy; the point is that capital relations lay at the root of systemic, symbiotic relationship with labour militancy which led to the chronic schedule delays of the period.

The 1980s

The root cause of the improvement in performance against schedule in the 1980s was the rise of managing contractors. Managing contractors, by monitoring, passing on risk, and emphasising the fixedness of design, served to limit, but not eliminate, the opportunities for construction contractors to undertake practices which harm performance against schedule. The new national agreement (advocated by the official union bodies, clients and state agencies and resisted by contractors and the cabin) along with the industry recession and the curbing of opportunism led to a fall in labour militancy in the 1980s. These factors also shaped a significant reversal in the flow of authority within worker organisation - cabin power gave way to the assertion of

authority of the official union body. The greater control over labour militancy in effect also facilitated the curbing of contractors' opportunism by blocking the previous ability of contractors to blame slow building on recalcitrant labour.

Managing contractors can adopt one of two alternative routes to improve performance - the low trust route or the high trust route. The low trust route involves an emphasis on curbing opportunism, rigidly fixing design, and subcontracting out all construction work. The high trust route involves an integration of design and construction, the sharing of information and costs between these areas, and the undertaking of direct construction work. The low trust route implies a 'step' improvement in performance, whilst the high trust route implies the basis for a longer term improvement. In the UK in the 1980s managing contractors took the low trust route, and they were not constrained in their choice by issues concerning labour. The improvement in economic performance appears to have been primarily related to performance against schedule. It should be recalled that performance against schedule is not a measure of economic efficiency and there is fragmentary evidence that in the 1980s productive efficiency was largely stagnant.

9.3. Implications for Research Methods

Chapter 2 put forward a number of methodological criticisms of the existing research on unions and economic performance which

stressed the limitations of the production function approach. The research findings from the case study approach adopted are able to cast further light on a number of points.

Chapter 2 showed that there was a widespread failure to model for management within the extant literature. It was argued that this was a crucial failing. Studies which fail to model for management and which put forward arguments of causation concerning union 'effects' may well be making spurious claims. Consider a statistical modelling of the ECI, 1960-90, which failed to model for opportunism and the rise of managing contractors. Such a modelling would find a clear correlation between militancy (perhaps proxied by the level of strikes) and schedule overruns. However, such a correlation would be largely spurious. Studies which fail to model for management should be treated with extreme circumspection.

Chapter 2 also raised the point that the problem of endogeneity may be relevant for studies in the UK which sought to correlate militancy with poor performance. The point here is that 'basic failures of production organisation [due to lack of management sophistication] may lead to lower productivity not only directly, but also indirectly through their effects upon union organisation and industrial relations' (Batstone, 1986:41). This is of clear relevance to the ECI where contractors' opportunism both lay at the root of delays and set a material context for militancy. In a sense, both poor performance and militancy in the 1960s and 1970s were 'created' by a third variable - contractors'

opportunism. This strengthens the argument made in chapter 2 that a detailed understanding of the social relations of production in the UK suggests that the problem of endogeneity may be an important one for studies which find a correlation between militancy and poor performance, particularly studies undertaken at the industry level.

The limitations of statistical studies in examining social processes was also a theme in the second chapter:- 'it is an in-built deficiency of the method of comparative statistics that it is ill-suited to the analysis of quality rather than quantity and to the exploration of social process' (Nichols, 1986:97). A detailed qualitative analysis of social process was at the heart of the approach adopted in this study. It is legitimate to argue that the qualitative subtleties of the dynamic symbiosis between opportunism and militancy in the 1960s and 1970s would be lost to a statistical modelling approach.

Finally, theoretical problems with the production function approach were also examined in chapter 2. The assumption implicit in the production function approach that the product market is given and determining was shown to be problematic. It fails to allow for the point that the analysis of unions and economic performance needs to investigate the relationship between the spheres of exchange and production. Such a relationship has been central to the research presented in this study. It was only the focus on this relationship which allowed the examination of the impact of labour militancy not just

directly on overruns but indirectly through its impact on capital relations and the profit strategy of contractors. Militancy in the 1960s and 1970s rather than forcing contractors into profit strategy based on improving productive efficiency lay in a dynamic symbiotic relationship with contractors' opportunism. The fall in militancy in the 1980s did not lead to an establishment of high-trust relations and a longer term basis of development through the integration of design and construction. The fall in militancy did, however, facilitate the rise of managing contractors whose stress on curbing opportunism led to improvements in performance against schedule. The NAECI played an important role in the fall in militancy and it also played a direct role in the commercial arena. The official trade union bodies played a central role in the establishment of the NAECI. Here then was a pro-active role of the official union bodies which facilitated an improvement in performance against schedule. This derived from the unique position of union officials within the industry - they were the sole key actors whose structural position served to define interests with an emphasis on ensuring longer term improvements against schedule.

9.4. The Organisation of Production in the ECI as Prototypical

Chapter 3 argued that the organisation of production on the ECI could be seen as prototypical in that in the ECI production is dislocated, with firms working with other firms on projects, and with firms permanently having to reconstitute and redefine

themselves, and in that a number of leading commentators ascribe exactly these characteristics to the nascent form of production in advanced capitalist countries.

In so far as the ECI constitutes such a prototype, what do the research findings imply for the understanding of this organisation of production, and what do the findings imply for the position of the UK economy under the reconstituted form of production?

The analysis has highlighted the necessity to have a detailed understanding of the nature of capital relations. In particular, it is not possible to formulate an adequate understanding of the nature of capital relations merely upon the basis of a specific structure of capital and a specific organisation of production. Just because production in the ECI is organised on a project basis with firms coming together, and with firms continually redefining themselves, it does not follow that these firms collaborate, rather than compete, nor that they have high trust rather than low trust relations, nor that they share information rather than systematically misinform.

In particular, the study of the ECI has shown how managing contractors faced two alternative routes in their approach to improving performance against schedule. One route involved an emphasis on curbing opportunism, rigidly fixing the design of the plant, and subcontracting out all construction work. This was termed the low trust route. The high trust route involved an

integration of design and construction, the sharing of information and costs between these areas, and the undertaking of direct construction work. The alternative routes entailed qualitatively different forms of capital relations.

This concept of alternative routes with qualitatively different forms of capital relations has important implications for Williamson's analysis of the dynamics of capitalist development. Williamson's main thesis is that more efficient modes of contracting emerge over time, and that changes in the structure of capital can be understood in terms of minimising transaction costs. It was argued in chapter 3 that an important sense the ECI can be seen as a crucial case for the Williamson hypothesis in that the organisation of production constitutes a strikingly clear example of what Williamson terms the 'fundamental transformation'. Williamson argues that this fundamental transformation is common to many aspects of production. The point here is that the ECI can be seen as entailing the fundamental transformation in its purest form. The fundamental transformation occurs where a condition of large numbers competition obtains at the outset but where a condition of bilateral treaty evolves thereafter (1991); a description which has clear parallels with the ECI in which the tender process evolves into the execution of a contract by one contractor for one client/managing contractor.

At one level his analysis appears persuasive. His analysis of changes in the organisational form of production in terms of

minimising transaction costs (and therefore not necessarily in terms of increasing the technical efficiency of production) accords with the organisational changes in the ECI in the 1980s which entailed a rise in managing contracting, a fall in opportunism, but apparently not a significant improvement in productive efficiency.

However, there are problems in the analysis of high trust relations within the Williamson framework. The problem is implicitly acknowledged by Williamson who introduced the concept of 'atmosphere' in an attempt to analyse trust relations in the employer-employee relationship. However, chapter 6 demonstrated that this concept lies in contradiction to his assumption of opportunism as a fundamental trait of human behaviour. Disabused of this concept, the creation of high trust relations is in principle feasible; however, the weight of the Williamson assumptions makes it almost impossible. The problem for Williamson in addressing high trust relations means that the framework cannot embrace the argument that the improvement in the ECI in the 1980s was essentially limited in nature because it was only based on a limitation of opportunistic practices, and because the essentially conflictual low trust capital relations were left unaltered.

Williamson's hypothesis that more efficient modes of contracting in capitalism emerge over time stands in direct contradiction to the analysis of Marx. Marx's hypothesis is that the nature of capitalist development is such that a disjuncture appears between

the social relations of production and the forces of production. According to Marx this disjuncture hinders the further development of productive capacity and serves to give rise to revolutionary pressures. Williamson clearly contradicts this by suggesting that further development of productive capacity will not be hindered because more efficient modes of contracting arise.

Marx's writings on the nature of inter-capital relations have received far less current consideration than his writings on the nature of capital-labour relations. This can be largely explained by the fact that his analytical prediction of the increasing centralisation of capital and the tendency of the rate of profit to fall coming to hinder further economic development has been shown by the subsequent history of capitalist development to be flawed. Despite his predictions, capitalist economies continue to grow.

The key point is that whilst the specifics of his prediction have been invalidated this does not mean that his more general analytical insight concerning crises arising from a disjuncture between the relations of production and the forces of production can be dismissed.

Lazonick has argued that the inadequacy of the specifics of Marx's prediction arise from his failure to adequately apply his own method - he neglected the role of the social relations of production and imparted an understanding of the process of

capitalist development as a technological imperative :-

'Marx argued.... that the development of industrial capitalism results in the concentration and centralization of production into a relatively small number of enterprises.... Marx simply argued that 'the productivity of labour.... depends in turn upon the scale of production' and 'therefore the larger capital beats the smaller'.

Thus despite his own emphasis on social relations of production, Marx ended up portraying the ongoing process of capitalist development as a technological imperative' (Lazonick, 1991:121).

Lazonick uses this discussion to dismiss Marx's work on inter-capital relations. However, this argument serves not to undermine Marx's more general insight but to aid an understanding of the problems within the specifics of his predictive analysis.

Consider again the general insight of Marx that disjunctures can arise between the social relations of production and the forces of production and that such disjunctures impede further economic development. It should be noted that the concept of social relations of production entails not only capital-labour relations but also inter-capital relations.

Properly understood, this insight has resonance with the finding that inter-capital relations in the ECI in the 1960s and 1970s were such that performance against schedule was poor and that

inter-capital relations in the 1980s were such that improvements in economic performance were necessarily limited in nature. Specifically, for instance, the low trust relations militated against the integration of design and construction through the use of the information feedback loops available within Computer Aided Design technology, and through the increased use of orbital welding equipment. The substantive findings illustrate the concept of the social relations of production impeding further economic development.

It can be countered that this conceptualisation continues to be flawed in that Marx's thesis was that a disjuncture would arise between the relations of production and forces of production which would inevitably find expression in revolutionary upheaval. This approach, therefore, would deny the possibility of a high trust route within capitalism.

This counter-argument is flawed, however. The argument that according to Marx the disjuncture must find expression in revolutionary upheaval rests upon a mis-understanding of Marx's approach, a misunderstanding based on Marx's own misapplication of his method. As was argued earlier, Marx came to the teleological view of the particular form of the disjuncture between the relations and the forces of production in capitalism through effectively interpreting the process of capitalist development as a technological imperative. Once the analysis is disabused of this concept of capitalist development as a technological imperative it loses the teleological understanding

of the inevitability of specific forms of disjuncture leading to revolution.

With the understanding that the analysis does not necessarily embrace a teleological vision it becomes possible to view capitalist development as being characterised by a number of disjunctures between the relations and forces of production, by a number of crises, none of which necessarily imply the end of capitalist development.

It is tempting to portray Thatcherism as a response to the onset of crisis for the UK, breaking up the rigidified relations of production which hindered economic development. Arguably, this indeed was a key aim of Thatcherism. The importance of this study of the ECI is that it highlights the importance of inter-capital relations within the social relations of production. This is especially relevant in that Thatcherism concentrated on altering capital-labour relations. Putting aside, for the moment, considerations of how far capital-labour relations in the UK were altered in the 1980s, it is clear that the study of the ECI suggests that any attempt to reform the social relations of production which failed to address inter-capital relations is likely to led to a simple step increase in economic performance rather than to the basis for sustained longer term economic development.

A similar argument is put forward by Cutler (1992). Cutler argues that there is an increasing emphasis amongst analysts of

Britain's economic performance of the need for an increase in vocational training in the UK, and that this emphasis fails to understand the importance of capital relations to the country's economic performance. In particular, he points to the futility of increasing training in light of the research by Williams et al. (1990) which highlights the importance of rentier capitalism in the UK. Williams et al examine data for 25 'giant' manufacturing firms, each with a turnover of at least £1 billion, and present case study evidence on a selection of the firms. The case study evidence suggests the importance to these large firms of passing on risk, of profit outwith production, and of treating their subsidiaries as little more than financial assets. For example, Williams et al. conclude that, 'GEC is becoming a rentier capitalist firm whose profits increasingly come from short term investment and shareholdings in electrical businesses which somebody else manages. GEC's remaining direct responsibility for manufacturing is increasingly confined to defence contracting where the profitability of development and production is guaranteed' (p.469). There are resonant parallels between this argument and the argument of this thesis concerning the route of passing on risk adopted by managing contractors in the ECI in the 1980s.

It is also relevant to note that increasingly commentators are beginning to re-assess the apparent Thatcher economic miracle of the 1980s as constituting a step improvement which did little to lay the basis for sustained economic development (e.g. see Crafts, 1991; Nolan, 1992; Michie, 1992).

In sum, in so far as the ECI can be considered a prototype in terms of the organisation of production and capital structure then it is clear that the Thatcher experiment aimed exclusively at reforming capital-labour relations was fundamentally flawed in that it neglected the centrality of the nature of inter-capital relations to the performance of the UK economy. Further, the evidence from this thesis that there has not been a fundamental shift in the nature of capital relations is echoed by Imrie and Morris' review of research on vertical capital relations in the UK economy (1992). They argue that the research shows that 'transformations are concentrated in particular sectors' (p.650). There has been no fundamental shift towards 'the adoption and implementation of new obligational practices' (p.650). Rather, 'many aspects of the adversarial system seem to have remained in place' (p.645). Indeed, there is evidence of a 'new adversarialism' (p.644) emerging in which the client is more able to assert 'a hierarchy of top-down control' (p.641). The evidence presented in this thesis of managing contractors pursuing a strategy of passing on risk exactly matches this overall picture.

9.5. The British Worker Question

1960s and 1970s

It was argued in chapter 3 that the ECI was a useful site for a case study because it constituted a crucial case for the British

worker question, the argument that labour militancy lay at the root of poor performance on the UK economy in the 1960s and 1970s. Ostensibly, the ECI represented an archetypal example of the British worker question.

The central finding of the research, however, was that it was contractors' opportunism which was at the root of the chronic schedule delays of the period. Labour militancy exacerbated delays, but the central significance of militancy was that it was used by contractors to reproduce favourable commercial relations with clients. Therefore, the British worker question has been rejected in a 'crucial' (Mitchell, 1983) case study. This means that the wider validity of the British worker argument to be put into serious doubt.

This conclusion accords with the substantive arguments developed in chapter 2 concerning the Metcalf hypothesis that powerful unions in the 1960s and 1970s impeded productivity levels, primarily through restrictive practices. A counter-argument was developed to show that job controls constituted a form of social organisation of production which matched the short term profit criteria, and low production skills of management. As the nature of product markets began to change substantially in the 1960s and 1970s a disjuncture began to appear between this social organisation of production and even short term profitability, prompting management into attempts at reform. Subsequent piecemeal and ill-conceived attempts at reform encountered resistance with unions temporarily acting as institutions which rigidified

the social organisation of production. This is an argument quite distinct from the British worker argument. The case study findings, therefore, sit well with it.

A further point developed in chapter 2 was that any short term constraints on the effectiveness of managerial strategy were far less relevant to understanding the poor performance of the UK economy than the fact that shopfloor relations did not push management into altering the nature of its short term approach, but rather served to consolidate it. Once more this finds support in the research findings on the ECI. The cabin militancy of the 1960s and 1970s did not push contractors into altering their profit strategy, rather it served to consolidate their stress on profit outwith production in that contractors were able to use militancy as a tool in their commercial relations with clients.

Further, there is evidence that this specific form of consolidation, involving a dynamic between opportunism and militancy existed in a number of other important industries in the period which suffered poor performance. The specific findings from the ECI have more general relevance.

Opportunism and Militancy in Other Industries

A number of industries can be identified which suggest the potential importance of opportunism in understanding their

performance and the existence of labour militancy in the 1960s and 1970s - shipbuilding, docks, construction, aerospace, and wider engineering. These have been identified by the existence of:

- some form of client-contractor relationship,
- design uncertainty/lack of client knowledge of production,
- cost-plus contracts.

Thus identified, secondary literature was examined in terms of:

- the potential for significant opportunistic behaviour by the contracting agent,
- the potential that labour militancy could have been exacerbated by such a strategy,
- the potential for a dynamic whereby the contracting agent used labour militancy in order to perpetuate a favourable form of client-contractor relationship.

Clearly, evidence concerning opportunism will be extremely difficult to locate in that an essential characteristic of it is its covert nature. In the ECI it was only through detailed archive and interview research that it was possible to provide evidence on opportunism. Therefore, a review of secondary literature is unlikely to uncover conclusive evidence on the existence of opportunism as an important profit strategy; rather the aim is to highlight the potential for the existence of opportunism in certain industries.

Shipbuilding

Thomas (1983) shows that the UK shipbuilding industry underwent a dramatic relative decline in the postwar period. In 1930, the UK produced just over 50% of additions to the world's merchant fleet, in 1950 the UK remained the world leader accounting for nearly 40% of world output, but by the mid-1970s the UK's share in world tonnage had dropped to less than 4%.

The industry's relative decline, and its client-contractor relations (shipowner-shipbuilder) make it a relevant industry to study. Further, it ostensibly constitutes another archetypal case (like the ECI) in which labour militancy caused poor performance. In particular, public bodies blamed militant labour for the decline of the industry (Geddes, 1966:29; Booz et al., 1973:6).

It is certainly true that the shipbuilding industry in the 1960s and 1970s was characterised by labour militancy - the Commission on Industrial Relations 1971 report into the industry notes :- 'the number of days lost per 1,000 workers has been running for several recent years at something like five times the average of the whole economy. In the same period only motor manufacture, coal mining and the docks have experienced a higher average incidence' (p.25).

Other elements - design uncertainty and cost-plus contracts - which suggest the potential for opportunism were also present. In relation to design uncertainty there is strong evidence that the demand of UK shipowners, which provided the bulk of UK

shipbuilding work, was of a bespoke nature subject to considerable change after the tender from a yard had been accepted and even after construction had begun (Thomas, 1983; Geddes, 1966:136; Booz et al., 1973:133; Reid, 1991:40, 42). Evidence on the widespread existence of cost-plus contracts is provided by Thomas (1983:195) and the 1961 Ministry of Transport report (p.47).

Given that there have been a number of influential studies of the decline of the shipbuilding industry, in order to adequately present a case for the potential role of opportunism it is useful to outline such studies and then to subject them to critical analysis.

The main studies are by Thomas (in the influential Williams et al., 1983) and Lorenz and Wilkinson (1986). Both stress the importance of the 'demand linkage' (Thomas, p.179) between the builder and owner in this decline. The basic argument of Thomas is that the shipyards became locked into meeting the bespoke demands of the UK shipowners, whilst the rest of the rising world demand was increasingly characterised by a standardised mass product. While the builders were locked into this relationship the owners had no such ties and increasingly in the 1950s and 1960s looked abroad for the construction of their ships, leaving UK yards increasingly bereft of orders. Thomas unequivocally assigns primary causal significance to this demand-linkage (p.179). This informs his suggestion that the appropriate state action to support the industry would have been to push the owners

into a more formal relationship with the builders (p.207) - essentially a form of protectionism.

Although the study represents an improvement on accounts of the industry which simply stress the role of militant labour it is ultimately inadequate in that it fails to examine the nature of the owner-builder relationship; in particular it fails to allow for the possibility that this relationship came to be beset by opportunism. Thomas views the relationship as harmonious, failing to conceptualise potential conflict of interest and how this conflict could inform action :- 'the long survival of the system [of informal client-customer relations] indicated that it worked reasonably well. It gave the shipowners the vessels they wanted, and the yards had close links with a major set of customers' (p.195).

This ignores the salient fact that the system may have given 'shipowners the vessels they wanted', but these ships arrived later than scheduled, cost more than budgeted, and took longer to build and cost more than the work done by the emerging foreign competition (Geddes, 1966:29; Ministry of Transport, 1961:7; Booz et al., 1973:5, 102-3).

This much highlights the central problem with Thomas' account, but is there evidence that UK builders acted opportunistically? Fragmentary evidence exists pertaining to underbidding, misinformation concerning poor design, lack of management production skill, lack of productivity data, and existence of a

seller's market.

In relation to underbidding, the Geddes report states that 'one builder will shave his price more than another if he is particularly keen to get the order either to fill a gap in his production programme or because of the prestige the order may win him' (p.27). Underbidding, of course, is unlikely to be reported, and mention of it by an important public report suggests that it may have been a significant practice.

Concerning misinformation on design/deliberately building from mistaken design, the Geddes report notes suggestively that 'many owners would prefer to receive more suggestions and more expert advice from British shipbuilders than they get' (p.16-17). The report adds that 'the reputation of individual British firms will tend to suffer if... they do not volunteer the suggestions for technical improvements [in design and construction] which the customer seems to expect' (p.30). An implication here is that UK yards may have tended to take advantage of design faults and uncertainty in a way which did not occur in foreign yards.

One corollary of a profit strategy which encompasses opportunism is a lack of investment in management skill concerning the organisation of production. There is evidence of such a lack of skill in UK shipbuilding. The Booz et al. report discusses 'shortage of managerial ability' (p.6), and 'unsophisticated planning' (p.139). Similarly, Lorenz and Wilkinson stress that 'management showed a comparative lack of talent and interest in

applying systematic planning methods' (1986:119). Thomas also takes the 'inadequate management' (p.179) as a given.

In the ECI the lack of available productivity data was seen as part of the contractors' attempts to resist tighter control by clients. It is therefore potentially relevant that UK shipyards provided no productivity data :- the Commission on Industrial Relations report notes that 'comparative statistics on productivity in shipbuilding are not generally available' (p.13), and that 'productivity figures hardly exist even in the most rudimentary form' (p.73).

Opportunism will be more likely in a situation where demand is high, in a sense creating a seller's market. Therefore, the situation described by Thomas is potentially relevant :- 'for a time on the 1950s it could be claimed that Britain's relative decline was not obvious. The seller's market concealed any weaknesses and full order books encouraged complacency' (emphasis added) (1983:181). This high demand would allow shipbuilders to undertake opportunistic practices and yet remain relatively immune from the gradual defection of UK shipowners to foreign yards.

The above evidence suggests that opportunism may have been significant. This leads to the consideration of evidence that such opportunism may have constituted an important element in the material context giving rise to militancy. Again fragmentary and suggestive evidence exists.

The key material context informing militancy was the largely casual nature of the industry. The Commission on Industrial Relations noted that 'in the case of one major shiprepairing company, the size of its manual labour force varied by 50% or more over very short periods' (1971:12). Whilst there is no direct link between opportunism and the fluctuating demand, of which labour bore the cost through irregular employment, it is also clear that opportunism as an inherently short-term strategy does not begin to address irregular employment as a problem. Moreover, firms on cost-plus contracts are not particularly concerned with the ensuing militancy. Lorenz and Wilkinson argue that the widespread demarcation rules in the industry can be seen as a form of job protectionism responding to the situation in which labour was expected to bear the costs of fluctuating demand (1986:128).

An important point which emerged in the examination of the ECI was that there was a contradiction between a profit strategy through opportunism and a labour control strategy through incentive bonus schemes, and that this contradiction informed militancy. There is evidence in shipbuilding of a parallel. Bonus schemes were an important element in labour control in shipbuilding. The number and standard of supervisors was low (CIR, 1971:76) and bonus schemes were widespread (CIR, 1971:49). Reid notes the contradiction between this and the bespoke nature of demand, and our analysis would add the contradiction between this and opportunism. Reid argues that 'the most obvious symptoms of this double failure to impose either an effective

system of supervision or an effective method of incentive payment were chronic absenteeism and very high levels of labour turnover' (1991:45).

A potential parallel with the ECI also emerges concerning shiftworking. In the ECI it was pointed out that despite the consistent schedule delays no attempt was made by contractors to introduce shiftworking. Evidence was presented which showed that contractors resisted the introduction of shiftworking because it would demand a higher level of management skills in planning, and because it was not in their interests. In this respect it is interesting to note that despite the consistent overruns in UK shipbuilding there was no attempt to introduce shiftworking in the key years of the industry's decline (Ministry of Transport, 1961:5; Booz et al., 1973:8).

Perhaps the hardest evidence to locate concerns the use of labour militancy by contracting agents to perpetuate the beneficial nature of the relationship with the client. Fragmentary evidence exists here. An important part in this dynamic is that contracting agents are able to make the client believe that cost-plus contracts are a necessity because of the militancy of labour, and that labour militancy is to blame for overruns. The Ministry of Transport report notes that there was 'a general feeling, as evidenced in the supplementary comments of a number of owners, that foreign yards were less prone to delays as a result of strike action than United Kingdom yards' (1961:5), i.e. clients believed that militancy underlay overruns. The same

report shows UK builders sought to resist tighter commercial control by the shipowners. It states that unlike for UK builders, for foreign yards 'in almost all cases penalties for late delivery were accepted as part of the contract in one form or another' (p.5). It also states that 'United Kingdom yards would quote on a 'cost-plus' basis instead of a fixed price' (p.4). It is likely that the shipbuilders would use arguments concerning labour militancy to justify this. It will be recalled that because of the very strong demand UK yards, despite the looser commercial control by owners, were still able to have generally full order books through until the mid-1970s (Thomas, 1983:180-81).

A supplementary point concerns the potential for opportunism by subcontractors to the shipbuilders. The use of outside subcontracting firms played an important role in UK shipbuilding - the Geddes report estimated that the cost of 'other supplies and subcontracts', 'account for upward of a third of a ship' (1966:69). The potential for opportunism by the subcontractors is implicit in the comment in the Booz et al. report :- 'subsequent to contract award overall planning is minimal and intercontract relationships are neglected' (1973:141). The case that opportunism could have played a significant role in the strategy of subcontractors becomes stronger when it is realised that some of the very same firms which operate in the ECI also operate in shipbuilding (CIR, 1971:2).

Construction

'Opening delayed as Eurotunnel blames builders....
The Eurotunnel Chief Executive.... said the opening
date was now in the hands of.... the Anglo-French
consortium building the tunnel, and accused them of
deliberately delaying it' (The Guardian, 20.4.93).

The potential for parallels with opportunism and labour militancy in the ECI is clear given that the ECI is part of the wider construction industry. However, in order to suggest such parallels it is necessary to disaggregate the industry. There are two types of building firm - the speculative builder and the contractor. The distinction is that the speculative builder owns the building being constructed and then seeks to sell/lease it whilst the contracting firm builds for clients who own the building. The parallels that exist are confined to the contracting sector. Within this, Ball notes the lack of integration of design and construction :- 'the fragmentation of the building process between different enterprises involved in design, surveying, contracting, plant-hire and materials creates a minefield of disputes, delay, avoided responsibility and missed opportunities for innovation' (Ball, 1988:96).

The industry is also relevant in that its poor performance was also subject to the argument that the primary malaise was militant labour. Ball (1988) describes the important political process by which capital in the industry was able to persuade

governments that the root cause of the industry's poor performance was the trade unions and the militancy of the labour force :-

'Even Labour governments have essentially seen building workers as a 'problem'.... the Wilson government of 1964 saw a shortage of skilled building labour and the power it gave workers to bid up wages as the problem of the building industry.... the 1974-9 Labour government legitimated LOSC [labour only subcontracting] through the introduction of the P714 tax-certificate scheme.... when contractors' political demands have been against building workers they have usually been successful' (p.74).

Both Ball and Evans argue strongly that opportunism is key profit strategy of contracting firms, and that passing on risk has characterised the strategy of firms in the 1980s. Evans states that 'under the contracting system difficulties predicting tender prices generate pressures to realise profit by maximising extra claims against clients. Improving efficiency is subordinated to the aim of avoiding risk and maintaining flexibility of financial assets for investment wherever it is most profitable, inside or outside construction' (1990:245). Included here are the familiar themes of extras, passing on risk, and stagnating productive efficiency as a corollary to the emphasis on profit outwith production. Ball stresses underbidding, and avoiding penalty clauses, and implicitly notes the occurrence of sitting on the job :-

'contractors prefer to overcommit themselves whenever possible in order to insure against periods when no new contracts are available. Projects are extended beyond contract dates if necessary. Extensions have been such an accepted part of the contracting system that penalty costs are rarely incurred.... During upturns.... over-commitment is easier, so long construction times and high-priced tender bids result rather than more actual building work' (1988:87-88).

Whilst the points are appealing given the evidence on the ECI it is frustrating that they are not grounded in empirical evidence. This criticism, however, cannot be applied to Ball's research into the merger activity of leading construction firms. It is illuminating that from this detailed research Ball concludes that by takeovers, 'contractors try to maintain a portfolio of building contracts.... A broad portfolio.... enables greater bargaining power with clients.... This advantage, however, has no positive effect on productive efficiency and costs. (1988:156). This picture of merger activity in order to enhance bargaining power with clients, avoid risks, and without regard to productive efficiency sits comfortably with the suggestion that opportunism played a significant part in the profit strategy of contracting firms.

Given that there are grounds for believing that opportunism may have been important, is there any evidence that this may have exacerbated labour militancy? Whilst Ball fails to make the

argument that client-contractor antagonism may have played an important role in forming the material context for labour militancy, he does hint at contradictions inherent in labour control through incentive schemes :-

'a high proportion of bonus payments has the added benefit to the employer of minimising the need to supervise the work of the operatives. The site location and bespoke nature of building work makes it difficult for management to control the intensity of work.... Work-study-based incentive schemes partially overcome the problem, although often bonuses are haphazard or not related to specific tasks but to attracting labour to site' (1988:92).

Incentive schemes are even more haphazard if the contractors are sitting on the job or are undertaking re-work following the deliberate tactic of building from a poor design.

The 1967 Report of a Court of Inquiry into Trade Disputes at the Barbican and Horseferry Construction Sites in London provides evidence of striking parallels with the ECI. At the Barbican site 'continued disagreements over bonus arrangements' were a major source of conflict' (p.11). Underlying these 'disagreements' was a conflict between the design contractor and the construction contractor, with major design changes leading to the breakdown of the bonus scheme as the instrument of labour control :-

'In many cases design changes necessitated the taking down of work already done.... These factors.... had

had a serious effect on site morale and in particular upon the operation of the bonus scheme by making it difficult for operatives to earn reasonable bonuses and creating an imbalance between earnings on different parts of the site. As a result the firm had had to relax bonus targets ad hoc so as to bring earnings up to a reasonable level' (p.25).

Our analysis suggests that the firm is likely to have exacerbated issues concerning poor design by deliberately constructing from design plans they knew to be faulty.

The report also provides strong evidence of the use of labour militancy by contractors as a bargaining tool in their contractual relations with the client. At the Horseferry site, at a client-contractor meeting when the client expressed concern with the progress on the project, the contractor's reply was a clear attempt to pass on blame to labour - 'the firm claimed in reply that this was due to certain individuals who were causing the trouble.... and listed a series of incidents which they claimed had disrupted production on site' (p.18).

The contractor's attempt to shift blame on to labour can be related to the form of contract in which the contractor was 'liable to a penalty of £900 for each day by which they exceed the completion date, but an extension of time can be granted in respect of strikes, lockouts, inclement weather and certain other contingencies' (p.3).

More notably, the report concluded that the contractor had

deliberately fomented an all-out strike for reasons concerning their commercial relationship with the client. The contractor was facing a loss on the contract and had been unable to use arguments concerning labour militancy to revise the terms of the contract. They, therefore, deliberately fomented an all-out strike by dismissing the shop steward committee, believing that an all-out strike would allow them to be released from the contract :-

'There is no doubt that by October, 1966... [the contractor] would have been glad to be released from this contract.... We think it was also very much in the minds of the Directors of the Company that if the primary purpose of the dismissal of the operatives failed, the whole circumstances might provide material on which a release from further performance of the contract could be sought. It appears to us that by adopting the expedient which they did, the Company was seeking to create a situation which could be exploited to their advantage whichever way events led' (p.51-2).

The last sentence expresses very well the idea that contractors would use labour militancy in an opportunistic, rather than in a Machiavellian, manner.

A final point from this report worth stressing is that it was only through detailed research that evidence on opportunism emerged. The ostensible purpose of dismissing the shop stewards, as expressed by the Company at the time, was to reform the bonus structure and improve productivity (p.50). It was only through

direct questioning of the Directors of the company by the Court of Inquiry that the real motive for their actions emerged.

Docks

There is evidence that the economic performance of UK docks has been consistently below that of continental ports - 'shipping lines observe that generally cargo handling has been slower, dearer and less reliable than at Continental ports' (Department of Transport, 1986:6). The industry was also characterised by high levels of militancy (Turnbull et al., 1992:70). The high levels of union power in the industry was seen as institutionalised in the National Labour Dock Scheme before its abolition in 1989, and the union power and labour militancy was seen as underlying the poor performance of the industry (National Association of Port Employers, 1988).

The industry exhibited the characteristics which are necessary for opportunism to play an important role. The shipping company-port operator relationship can be seen as analogous to the client-contractor relationship. Whilst there is no degree of uncertainty concerning issues of design, there is a lack of knowledge by the client of the production process (cargo movement), and once the bilateral exchange has been entered into the shipowner is in a position of great vulnerability, especially given the high costs to the shipowner of delayed turnaround. Further, dockwork was undertaken on a cost-plus basis. Willman notes that, 'these [restrictive labour] practices caused

extensions of the time a ship stayed in port.... and the cost of the entire system was passed on to the merchant or shipowner' (emphasis added) (1986:110). Also, a former official of the employers' association stated in discussion that the industry 'operated on a cost-plus basis' (discussion under terms of anonymity).

Turnbull (with his fellow authors) has recently put forward in a book and a series of articles a sensitive account of the performance and labour militancy of the industry. In order to suggest that opportunism may have played an important role it is useful to briefly outline the main arguments developed by Turnbull and then subject these to critical analysis.

Turnbull's analysis of the economic performance of the industry has three main facets. Firstly, he argues that there is a 'conflict of interest' between the port operator and the shipping company, the outcome of which is that ports will not be run efficiently according to client criteria if the port operators run the ports according to a 'commercial model', only focusing on immediate demand, failing to invest ahead of future demand. This leads directly to the second main facet - state intervention is necessary to alter the sub-optimum outcome of this conflict of interest. Therefore, in understanding the poor performance of the UK industry 'it was not the extent of state intervention in the ports that was the problem but its character' (Turnbull and Weston, 1992:386). Lastly, Turnbull and Weston argue that labour militancy, in the form of 'restrictive practices' and

strikes played a part in the poor performance of the industry :-

'the employment arrangements and working practices described.... clearly contributed to the relative inefficiency of Britain's ports. In particular, many of the 'restrictive practices' associated with casualism, which dockers defended as 'protective practices'.... had a detrimental effect on waiting time' (1992:394).

To improve the performance of the industry 'greater flexibility and improved labour utilization was a necessary but not a sufficient condition' (Turnbull, 1991:31). Therefore, to simply concentrate on these aspects allows the strengthening of the commercial model, and does nothing to promote the longer term economic development of the industry.

Two criticisms of this understanding of the performance and the social relations of the industry can be made. Firstly, whilst Turnbull and Weston in particular are concerned to criticise a neo-classical analysis of the industry they do not address the adequacy of a transaction costs approach. This means that the analysis is not sensitive to the potential importance of opportunism. It is suggested below that indeed opportunism may have been prevalent. Secondly, while the studies are sensitive to the origins of 'restrictive practices'' in terms of a reaction to casualism in the industry the analysis in effect treats these practices as standing separately from the commercial strategy of the employers. They fail to see how these practices and an opportunistic and short-term approach to profit creation by

employers could potentially become meshed in a symbiotic relationship. Vital here is the conspicuous absence of any consideration of the importance of cost-plus contracts. In a book of 270 pages focusing on the industry there is only one (indirect) mention of the existence of cost-plus contracts (Turnbull et al., 1992:98).

There is evidence which suggests that opportunism may well have been prevalent. A former chairman of the recently privatised British Transport Docks Board has described the structure of the industry in the following terms :-

'there is an excessive fragmentation in cargo handling, unco-ordinated transport to and from the port, a multitude of clearing and forwarding agencies and, within all this, the inertia of long-established customs.... all concerned are able to pass the buck'

(emphasis added) (quoted in Turnbull et al., 1992:36).

Here, 'excessive fragmentation' refers to a complex network of contracting relationships; 'pass the buck' refers to a strategy centred on passing on risk and the ability to deflect blame on to another party; and 'the inertial of long-established customs' can be seen as referring to stagnating efficiency.

Opportunism will be more likely to be important in periods of high demand. Although the following description of the product market refers to its impact on the power of labour, its relevance for contractor power should not be overlooked :-

'The product and labour markets of the postwar period

further reinforced the dockers' power. The post-war boom and the consequent expansion of world trade witnessed a 124 per cent increase in the tonnage passing through Britain's ports.... 1947-65' (Turnbull et al., 1992:216).

In these circumstances, given that workers could use the shipping company's weakness (once the bilateral exchange had been entered into) in terms of 'bargaining counters' (Willman, 1986:110) then so could the port operators. Indeed given that the UK port employers have been characterised by Turnbull as following the short-termist commercial model then this much can be expected.

If creating profit through opportunism rather than through increasing productive efficiency was important to port employers then a lack of managerial skill in the organisation of the production process can be expected. This expectation is clearly met :-

'employers abdicated considerable control over the organisation of work to their foreman and dockers themselves. Thus there was very little technological or managerial structuring of the immediate work process' (Turnbull et al., 1992:40).

What of the link between opportunism and labour militancy? The key element informing the militancy of the dockers was the casual nature of employment. Casualism was a result of the fragmented structure of contracting relationships in the industry :- 'the organisation of the industry was therefore not only complex and

fragmented, leading to complex patterns of pricing and port charges, but it also led directly to fragmented forms of employment' (Turnbull et al., 1992:42). Fragmentation in the organisation of the industry will be more likely in low-trust relationships characterised by opportunism.

In the ECI militancy was often related to bonus issues. It is, therefore, relevant to note that bonus issues were a key immediate cause for unrest in the docks industry (Turnbull et al., 1992:22).

An important way in which port employers could be seen as using labour relations to their benefit was suggested by a former official of the employers' association when he stated, in discussion, that the 'employers hid behind a monopoly union' in their relations with the shipping companies, arguing that the port operators could deflect demands from shipping companies for improved performance by blaming labour militancy. The image of 'hiding' is similar to Turnbull et al.'s metaphor of the NDLS as a 'shield' :- 'in short, supposedly inadequate disciplinary procedures were more often a shield for managerial incompetence than a proscription of managerial prerogatives' (1992:81). Port-employers benefitting from a cost-plus relationship with their clients had little incentive to address issues of labour control when labour militancy reinforced the nature of the relationship with the client. This does not suggest a level of Machiavellian strategy by port-employers - indeed the short-termism and willingness to accede to labour demands might derive from the

shipping companies - 'the employer would frequently come under strong pressure from the shipowner to settle any disputes quickly and get the ship turned round' (Turnbull et al., 1992:43). This is strongly reminiscent of Berry's (1983) description of the relationships at the construction of the Llanwern steelworks (reported in chapter 7). The point is that the port operators benefitted from a perpetuation of labour militancy and cost-plus contracting with shipping companies.

This all begs the question that if the port operators benefitted from the system of relationships which was in part institutionalised in the NDLS why did they press for the abolition of the NDLS? Two points are relevant here. The port employers' association, NAPE, only came to lobby militantly for its abolition in the mid-1980s (Turnbull et al., 1992:88). Secondly, this timing can be related to the fall in profits that port employers experienced in the early-1980s (Turnbull et al., 1992:31) and the fact that 'non-Scheme ports captured an increasing proportion of Britain's trade' (Turnbull et al., 1992:68). With the slump in demand in the 1980s and the competition from non-Scheme ports, profitability through opportunism 'shielded' by the NDLS became less and less viable.

Aerospace

The UK aerospace industry has been beset by chronic schedule and budget overruns on projects (Plowden Report, 1966:22; Pugh, 1986;

National Audit Office, 1986:20). An examination of the limited secondary literature suggests that opportunism by contractors and subcontractors may have played an important role in this.

The client-contractor relationship clearly exists in the industry, with the government as the main client (Plowden, 1966:15). The Plowden Report indicates the prevalence of cost-plus contracts :- 'virtually all military development work is paid for on the basis of full cost plus a profit element' (p.81). The National Audit Office (1986:2-3) and Pugh (1986) indicate the high level of design uncertainty and poor level of project definition.

There are also suggestions of opportunistic practices. The National Audit Office report notes that the contractors were 'over-optimistic' (1986:1). This can be interpreted as evidence of systematic underbidding. Opportunism is also suggested by the National Audit Office comments that 'deficiencies in their [contractors'] cost plans and management arrangements weakened cost control, and cost-plus contracts gave no incentive to produce realistic estimates or contain costs' (1986:1); and that 'contractors' optimism as to the feasibility of projects had not always been matched by their willingness to agree firm prices for their development' (1986:17). Further, the report suggests that lack of information militated against the competitive process leading to the withering-away of opportunism over the longer term :- there was 'little evidence of systematic monitoring of past performance or the realism of cost estimates to provide a more

reliable basis for future estimates' (p.15). Jones (1985) notes the weak commercial control exercised by the UK state as a client compared to the control exercised by USA federal state :- 'despite its greater involvement in the structure of the industry the different state agencies lack the administrative resources for the kind of detailed scrutiny and regulation of contractors' affairs that is possessed by the US Department of Defense' (p.231-2). Given that the state did not create an effective monitoring system opportunism can be anticipated. That client-contractor relations were not high-trust in nature is indicated by the Minority Report within the Plowden Report which indicates that 'relations between contractor and customer have become soured' (p.99). The recommendation of the Plowden Report that the government should purchase a financial share in airframe companies, i.e. a recommendation of vertical integration, is of course a classic response to the existence of opportunism.

In aerospace the poor performance has never been directly attributed to union power (although the 1986 National Audit Office lists 'the effects of industrial disputes' in a list of 'other factors which have contributed to time and cost problems' (1986:18)). Extensive job controls did, however, exist in the industry (Jones, 1985). Interestingly, Jones argues that the form of client-contractor relations led to the 'hoarding' of labour by contractors (p.233). This is in contrast to the discussions of opportunism in other sectors of the economy where it was associated with the casualisation of labour. Jones clearly believes that the shopfloor strength of labour derived

from the nature of the capital relations in the industry, and that the shopfloor controls were only part of the story of the poor performance in the industry - 'the broader economic performance of an industry may be reduced by the workers' organised controls over employment and work practices. This question has been left deliberately open here. What the preceding analysis has tried to suggest is that the British institutions of shop floor bargaining and craft style union tactics may not be the only relevant source of those controls' (emphasis added) (p.251). Given this insight it is frustrating that Jones fails to analyse client-contractor relations in terms of the potential for opportunism. Evidence suggests it may have been prevalent.

Wider Engineering

As well as aerospace it is possible that opportunism may have been important in other sectors of engineering. Client-contractor relations can be seen to exist in a number of sectors with the contractor more commonly known as the supplier. Relevant here are engineering firms which acted as suppliers to car manufacturers, to aerospace firms, to engineering construction firms, to shipbuilding firms, as well as weapons manufacturers supplying the army. Design uncertainty is clearly a factor in the latter four sectors.

The question of how prevalent cost-plus contracts were in these client-contractor relations in the 1960s and 1970s is of

considerable importance. Tolliday notes the importance of cost-plus contracts in car manufacturing in wartime for the ability of management to pass on wage rises (1985:112). Similarly, Piore and Sabel, albeit with reference to the USA, stress the importance of cost-plus contracts in wartime in the shaping of management-labour relations (1984:101). Unfortunately, there is no clear evidence on how widespread cost-plus contracts were.

By and large the studies of the emergence of job controls on engineering have neglected to analyse the form of customer-supplier relations. They have focused upon the shopfloor almost as an autonomous area, in effect stressing the agency of labour to the neglect of the understanding of the material context for this action. This focus can be related to the perception of the autonomy of industrial relations in advanced countries in the post-war period. As chapter 1 argued this was most plainly stated by Dunlop's model of the 'industrial relations system'. Many writers who would not share some of the more conservative implications of Dunlop's particular model did however implicitly share the view of the labour process as a semi-autonomous social area.

One important exception to this tendency is the study by Scullion and Edwards (1988). In the factory which is the focus of the study, 'Premier Metals' from 1955 to 1980, they found extensive and strong shopfloor job controls. They then pose the vital question - why did management tolerate these craft controls? The essence of their answer can be found in a 1958 quotation from the

managing director of the firm :-

'Labour relations have not been too satisfactory.... bad practices in the past were condoned by management and which are now claimed as custom and practice by the trade unions. These practices were the inevitable outcome of our costing formula which was virtually a 'cost-plus' basis. In other words, the higher the labour costs the more profit was made and a bigger return to overheads' (emphasis added) (1988:130).

The existence of cost-plus contracts alongside craft controls on the shopfloor lead the authors to put forward the perceptive argument that 'critics and defenders of the shopfloor record have tended to treat it as separate from other parts of companies' activities. They need to be examined together.' (1988:148).

This gets at one of the criticisms of Turnbull's examination of the docks industry - the failure to look at the commercial strategy and labour relations together. The existence of cost-plus contracts in periods of high demand suggests that militancy and opportunism could exist in a symbiotic relationship. An apparent unity of interest of the workforce and the supplier is clouded by the contradictions in the role of the bonus scheme, and the readiness of management to pass on product market volatility on to the labour force in the form of redundancies. Further, as gradual changes in the nature of client-contractor relations occur management attempts to undertake piece-meal reform of labour relations and production. But such piece-meal attempts merely exacerbate labour militancy. This is the scenario painted by Scullion and Edwards at Premier Metals when

they describe profitability problems leading to management attacks on job controls which in turn led to union resistance and intensification in the climate of distrust (p.134-6). There is a case that such a scenario existed in the wider engineering industry in the 1960s and 1970s.

This review of the secondary literature on shipbuilding, docks, construction, aerospace and wider engineering suggests the dynamic of opportunism, poor performance and militancy identified in the ECI may have more widespread significance. It is not put forward as a general model, however. It is put forward as an important specific form of the widespread phenomenon of shopfloor relations consolidating the managerial strategy of the 1960s and 1970s.

1980s and Beyond

A corollary of Metcalf's argument that powerful unions underlay the poor performance in the 1960s and 1970s is that the 'productivity miracle' of the 1980s was primarily caused by changes in industrial relations, in particular the 'fear factor' of impending unemployment mobilising workers into accepting greater flexibility and into working harder (1989:19).

This argument is contradicted by the evidence of the ECI where the root cause of the improvement in performance against schedule lay in the rise of managing contractors, rather than in

substantial industrial relations change. Whilst Metcalf is ambivalent about how far the 1980s' improvements in productivity growth are sustainable, this study suggests that the 1980s witnessed a step improvement rather than the establishment of a basis for longer term economic development.

Metcalf's entire focus is upon the constraints which unions impose upon the effectiveness of management strategy, with the guiding concept that, once unconstrained, management will choose an optimum path of economic development. But in the ECI, free from constraints of high labour militancy underlain by cabin power (which militate in favour of low trust relations), managing contactors in the 1980s adopted a low trust route, implying a step improvement.

There is strong indirect evidence that the productivity improvements in the wider economy also represented a step, rather than a fundamental shift in productive strategy towards up-market restructuring. Firstly, the UK labour force has not become a highly skilled labour force in the 1980s, as should be expected. As Evans, Ewing and Nolan (1992) note, where flexibility has increased it has predominantly not led to a multiskilled workforce. Secondly, there is no evidence of an emerging sophisticated HRM strategy in the large and growing non-union sector. The WIRS 3 data (Millward et al., 1992) clearly shows that the institutions associated with a sophisticated HRM approach - company councils, quality circles, profit-related pay - are not prominent in the non-union sector. If up-market

restructuring had occurred it would be expected that firms would undertake an HRM approach to enlist the necessary commitment. Thirdly, 'multinational companies.... have come to see Britain not as a base for highly skilled, high value-added production but as an ideal location in which to carry out labour-intensive assembly and sub-assembly work' (Nolan, 1989:113). Again systematic evidence here is difficult to obtain but Nolan makes a strong argument that in the paradigmatic case of motor vehicles, the above argument is correct.

The Thatcher reform approach which suggested that management unconstrained would make optimum decisions looks to be misconceived.

9.6. Conclusion

This thesis began by arguing that industrial relations as a field of study was undergoing a transformation, and that the more useful development would be a transformation into the study of the political economy of production.

The crisis in the study of industrial relations was related to the disintegration of the existence of industrial relations as distinct social area. Such a disintegration was evident within the ECI. A simple focus, within the traditional definition of industrial relations, upon matters pertaining to job regulation would have given only a partial understanding of the meaning and

origins of labour militancy. A fuller understanding was only possible through a wider focus on the political economy of production, through an analysis not only of the context of labour militancy set by capital relations but also of how labour militancy interacted with capital relations.

An alternative form of development was the transformation of industrial relations into the study of human resource management. Implicit within the HRM approach is the guiding concept that the nature of employee relations is a key determinant of economic performance such that long term strategies towards employees, fostering loyalty and cooperation, should form an important part of the wider business strategies of firms. This mistakes a particular form of relationship between industrial relations and economic performance as THE form. That the relationship between industrial relations and economic performance is a more complex one than implied by the HRM approach has been amply demonstrated in this study of the ECI. Indeed, it has been argued that opportunistic contractors have used labour militancy as a tool in their relationship with clients in other important sectors of the UK economy in the 1960s and 1970s.

Not only clients but labour have had to bear the costs of the system of relationships that have existed in the ECI. If this study within the framework of the political economy of production has shown that labour should not have to bear the blame as well as the costs then it has served a useful purpose.

APPENDIX 1ECONOMIC PERFORMANCE DATA - ASSUMPTIONS AND SCREENING

This appendix sets out in detail the precise assumptions behind the presentation of the results of the statistical analysis of the economic performance data that was set out in chapter four.

As chapter four outlined, there are three secondary sources for the economic performance data - the 1970 NEDO report, the 1976 NEDO report, and the 1988 NEDO/NJC report. The three sections of this appendix deal with each of the sources respectively. Each section begins with a reproduction of the relevant sections from the tables in the reports, and proceeds to detail the particular manner in which this thesis has interpreted the data.

1. Data for the 1960s - the 1970 NEDO ReportTABLE A.1. Power Station Performance (Source: NEDO, 1970)

Power Station	Delay in Completion (months)					Original Constr. Schedule (months)
	1st set	2nd set	3rd set	4th set	5th set	
1	25	17	9	8*	9	88
2	3	6	6			60
3	24	24	29	35		69
4	24	24				60
5	5	14	3	-		72
6	-	-	-	5	4	35
7	14	17	8	8		79
8	29	27	26	27		77
9	18	6	5	6		78
10	6	6	3	15		67
11	7	7	4	3		67
12	7	3	2	2		83
13	16					86

Notes 1. * Based on first synchronising date: resynchronised 2 years later following accident.

Source: NEDO, 1970:125.

Table A.1. above gives 'details of excess costs and building programme delays at a selection of power stations recently completed in GB or still under construction' (NEDO, 1970:125). In the table information is given for delays in completion for each set of a power station, whilst the original construction schedule is given for the entire project. In order to calculate

a schedule delay statistic (i.e. overrun as percentage of original schedule) for each project, for each project the average delay was calculated for each set, and then this average was expressed as a percentage of the original construction schedule. For instance, for power station 1 the schedule delay was calculated by taking an average of 25, 17, 9, 8, and 9 (=13.6), and expressing this as a percentage of 88 (15.45%).

TABLE A.2. Oil Gasification Plant Performance (Source: NEDO, 1970)

Type of Project	Duration of Construction (months)		
	Planned	Actual	Delay
Refinery Expansion	18	24	6
Refinery Expansion	18	19	1
Refinery Expansion	20	25	5
New Refinery	25	34	9
New Refinery	21	21.5	0.5
New Refinery	24.5	24.5	-
Oil and Chemical Plant	21	29	8
Oil and Chemical Plant	12	19	7
Oil and Chemical Plant	23	23	-
Oil and Chemical Plant	24	23	-1
Oil and Chemical Plant	18	19.75	1.75
Oil and Chemical Plant	27	27	-
Oil and Chemical Plant	20	25	5
Elec. Generating Plant	16	23	7
Elec. Generating Plant	28-30	30-31	2-1
Elec. Generating Plant	20	28	8

Source: NEDO, 1970:126.

Table A.2. above gives data on 'some major oil and chemical plant projects constructed in recent years' (NEDO, 1970:126). In the table information is given on sixteen projects in the form of planned construction, actual construction and delay. To calculate a construction schedule delay statistic for each project, for each project the delay was expressed as a percentage of the original construction schedule. For the fifteenth plant in the table the planned schedule is assumed to be 29 months, and the delay to be 1.5 months.

TABLE A.3. Oil Gasification Plant Performance (Source: NEDO, 1970)

Plant	Delay in Commissioning (months)
1	14
2	2
3	-
4	13
5	0.5
6	8
7	23

Source: NEDO, 1970:126.

Table A.3. above gives data on 'some major oil gasification plants constructed since 1961' (NEDO, 1970:126). Information is given on seven projects in the form of delay in commissioning the last unit of the plant for each project. Original construction schedules are not given for each project, but the information is

given that 'the construction period for these plants usually covered a period of two to three years'. From that it is assumed that those projects with a delay of longer than 10 months had an actual construction period of 36 months, whilst those projects with a delay of less than 10 months had an actual construction period of 24 months. Enough information now exists to calculate schedule delay statistics for each project, e.g. for the first plant actual length is assumed to be 36 months, the delay is given at 14 months; therefore the construction schedule delay is 63.6% ($=14/(36-14)$ as a percentage). The seventh project is excluded from the statistical analysis. The arbitrary assumption concerning actual construction periods means that its schedule delay is calculated as 176.9%, far higher than any other schedule figure in this period. It should be noted that excluding this obviously severely overrun project, effectively treating it as an outlier, will serve to weaken the expected relationship between time and economic performance.

2. Data for the 1970s - the 1976 NEDO ReportTABLE A.4. Performance of 7 Case Study Projects (Source: NEDO, 1976)

Projects	Overrun on Planned Project Time (%) (1)	Actual Construction Time (months)	Actual Construction Time (months)
Ethylene	68	51	41
Distillers	41	48	39
Refinery 1	33	32	27
Refinery 2	0	37	25
Methanol Plant	0	28	21
Power Station	64	87	69
Power Station	18	73	59

Source: NEDO, 1976:10.

Notes 1. 'For purposes of comparison, project time on power stations is measured to synchronisation of the first unit' (NEDO, 1976: 10).

2. 'Construction time is measured from start of civil engineering to completion of construction' (NEDO, 1976:10).

Table A.4 above gives data on seven projects in terms of actual construction time, actual project time, and overrun on planned project time expressed as a percentage. The problem here is that

schedule delay is based on the whole project (i.e. from the start of design to the plant coming on stream), and not just on the construction phase, the latter being the basis for the calculation elsewhere in this thesis. The assumption is made that the construction schedule delay was equal to the project schedule delay (both expressed as percentages). This assumption is extremely likely to make the observed construction schedule delay lower than the actual construction schedule delay. Therefore the assumption will work in the opposite direction than the expected direction of the relationship between economic performance and time. The observed construction schedule will very likely be lower than the actual construction schedule delay because, as table A.5. below indicates, construction schedule delays tend to be longer than overall project schedule delays.

TABLE A.5. Performance of 16 Questionnaire Projects (Source: NEDO, 1976)

	Design	Procurement	Construction	Overall Project
Percentage Lateness	36	28	42	21

Source: NEDO, 1976:23.

Note 1. 'Overall project refers to time from planned start of process design to date planned for bringing plant on stream' (NEDO, 1976:23).

Table A.5. gives data on sixteen UK projects, with data supplied

by clients concerning 'their most recent projects' (NEDO, 1976:23). In the table average construction schedule delay is given for the whole sixteen projects, not for individual projects. The cumulative average is 42%. It is a weakness that this data cannot be broken down by individual projects because this prevents the calculation of a number of relevant statistics - percentage of projects delayed, and schedule delay for projects excluding power stations. The inability to separate out the power station projects are spelled out in more detail in chapter 4. The sum of that discussion was that the exclusion of power station projects for other time periods did not substantially alter the overall level of schedule delay.

The key NEDO official responsible for writing the 1976 NEDO report stated that there was no overlap of projects between tables A.4. and A.5. above, nor between the projects covered in the 1970 report and in the 1976 report.

3. Data for the 1980s - the 1988 NEDO/NJC ReportTABLE A.6. Performance in the 1980s (Source: NEDO/NJC, 1988)

Project	Year Complete	Performance
Grangemouth Ethanol Plant - BP	1982	One Month ahead of Schedule
Easington Gas Terminal - BP	1983	On Schedule
Killingholme Refinery Expansion - Lindsey Oil	1983	5 Months behind Schedule
Culham Joint European Taurus Nuclear Fusion Research Project	1983	On Schedule
Dalry Vitamin C Production Plant - Hoffman La Roche	1983	On Schedule
Sellafield Site Ion Exchange Effluent Plant - BNFL	1984	To Client's Satisfaction
Billingham Nitric Acid Plant - ICI	1984	10 Mths Faster Than Previous Comparable Project
Pembroke Visbreaker - Texaco	1984	3 Months ahead of Schedule
Barry Silicone Plant	1984	To Client's Satisfaction

Mossmorran Gas - Shell/Exxon Chemical	1984	To Client's Satisfaction
Shell Haven Kero Mode Project - Shell	1984	On Schedule
Sellafield Fuel Handling Plant - BNFL	1985	To Client's Satisfaction
Port Talbot Hot Strip Mill - BSC	1985	On Schedule
Morecambe Bay Barrow Gas Terminal - British Gas	1985	To Client's Satisfaction
Pembroke Continuous Catalyst Regeneration - Texaco	1985	4 Months ahead of Schedule
Fife Ethylene Plant - Esso	1985	5 Months ahead of Schedule
Stanlow Platformer 3 - Shell	1985	Ahead of Schedule
Drax B Coal Fired Power Station - CEGB	1986	7 Months ahead of Schedule
Redcar Blast Furnace - BSC	1986	Substantially on Schedule
Easington Rough Onshore Storage Facility	1986	To Client's Satisfaction
Killingholme Refinery MTBE/TAME Project - Lindsey Oil	1987	1 Week behind Schedule

St. Fergus Fulmar Gas Terminal - Shell/Esso	1987	3 Months ahead of Schedule
Stanlow Lube Oil Project - Shell	1987	On Schedule
Liverpool Edible Oils Plant - Bibby	1987	To Client's Satisfaction
Immingham Chemical Plant - Norsk Hydro	1987	Successfully Completed
Wilton Power Station Coal Firing Project	1987	To Client's Satisfaction
Heysham 2 Power Station - CEGB	1988	On Schedule
Dimlington Gas Terminal - BP	1988	On Schedule
Shell Cat Cracker 2 - Shell	1988	To Client's Satisfaction
Workington PET Plant - Eastman Kodak	1988	On Schedule
Washington Car Assembly Plant - Nissan	1988	On Schedule
Sevenside Ammonia Plant - ICI	1988	To Client's Satisfaction

Source: NEDO/NJC, 1988.

As indicated in chapter four, this data from the 1988 NEDO/NJC report was systematically screened by examining NEDO files concerning the compilation of the 1988 report, by sending a questionnaire to clients, and by an examination of project files held at the NJC. In this screening process five of the thirty two projects were excluded because they were non-nominated projects, and therefore likely to have been included to serve the purpose of improving the overall picture. A further project has been excluded because a substantial part of its construction schedule took place prior to the introduction of 1981 national agreement.

To preserve anonymity there is no correspondence between the ordering of the screened data and the order of projects in the 1988 NEDO/NJC report.

Table A.7. below gives the screened data.

TABLE A.7. Schedule Delay in the 1980s - The Screened Data

Project	Planned Construction Schedule (months)	Construction Overrun (months)
A	12	2
B	18	5
C	24	0
D	14	0
E	23	-2
F	22	-4
G	30	0
H	23	-4
I	51	-5
J	90	-1
K	4	0
L	24	18
M	11.5	1.5
N	21	0
O	24	1.5
P	75	0
Q	28	0
R	22	4
S	22	0
T	22	2
U	67	14
V	30	0
W	27	12
X	38	-3
Y	24	6
Z	37	0

APPENDIX 2ABSENTEEISM, TIME DISCIPLINE, AND WET WEATHER WORKING

Chapter 7 showed that the labour militancy of the 1960s and 1970s embraced issues of both economism and work control. The central argument advanced was that whilst militancy directly exacerbated delay, its main significance was that it was used by contractors to perpetuate the form of commercial relationships with clients which underlay schedule delays. Given that this is the first time such an argument concerning labour relations and commercial relations has been advanced in academic literature it is necessary to substantiate it with detailed evidence. To this end, this appendix details the evidence concerning three issues of work control - absenteeism, time discipline and wet weather working - firstly, in the 1960s and 1970s, and then in the 1980s. The section does not add anything new in analytical sense but serves to strengthen the empirical basis of the argument.

The issues are particularly worthy of examination in a discussion of labour relations and economic performance given that in the survey of contractors undertaken by the 1970 NEDO working party 10% of contractors put down 'unexpectedly low labour productivity' as their first-ranked reason for schedule delay. The three issues can be seen as potentially important causes of 'unexpectedly low labour productivity' (survey discussed in chapter 5).

1960s and 1970sAbsenteeism

In relation to absenteeism in this period, there is tentative evidence that absenteeism tended to be high and that this was often related to the availability of overtime. The 1970 NEDO report included as an appendix a case study of a project researched by the Department of Employment and Productivity. The appendix reports that 'despite the fact that contractors had kept the site open for weekend and overtime working the response was very poor. Absenteeism.... was abnormally high' (p.104). At the 1970 wage negotiations at Grangemouth the contractors quoted levels of 'sick absenteeism' between 12.9% and 15.3%. The 1976 NEDO report stated that absenteeism on the seven UK projects studied ranged from 8% to 15% (p.20). The 1986 NEDO report on the Sullom Voe project also noted the existence of high overtime and absenteeism. Marshall of the CEGB, in his evidence to the Sizewell Inquiry, noted that high absenteeism existed with 'the reason being that men were able to absent themselves for one day during the basic working week and make up the earnings potential and more at the weekend through the application of premium payments for overtime' (day 80, p.75). The 1969 BP document detailing notes on the proposed site agreement states that 'overtime worked at premium rate is often accompanied by a corresponding loss of time at basic rates because of absenteeism'. Portus of ICI (in Wearne, 1970) described the

situation at the Wilton site in the mid-60s as, 'a curious correlation between overtime and absenteeism was observed, in that if the overtime was 25% then the absenteeism was 25%. Furthermore it was found that at this level an average attendance time of only 40 hours per week per man was being achieved' (1970:31/2). At a 1977 NEDO meeting a representative from Shell stated that in the mid-60s on Shell sites 'increasing overtime led to high absenteeism, the imbalance thereby created in the workforce reduced productivity, sending progress spiralling downwards'. The high level of absenteeism can be legitimately interpreted as a means of the workforce autonomously regulating their hours and earnings outwith management control.

It should be noted from the above that there is a tendency to describe levels of absenteeism as 'high' rather than to give specific statistics. The paucity of reliable statistical evidence on levels of absenteeism is of itself important. The extent of contractors' lack of emphasis upon the production process as a profit locus is highlighted by the apparent lack of knowledge by contractors of their own absenteeism levels. The 1986 NEDO report on the 1975-82 Sullom Voe project notes that,

'attention was first turned to this subject in 1978 when BP asked their contractors to account for their absentee levels. Their immediate response was that it was within acceptable bounds. Upon further scrutiny, however, it was found that absentee levels (including certified sickness, absence with and without permission and compassionate leave) were at around 16-

18%.... It had been apparent that no-one in fact measured the level of absenteeism in any systematic manner. Realising this, BP established a common method of measurement to be applied by all contractors as a first step to understanding the size of the problem and toward taking corrective action in reducing lost time.... BP complained that contractors' management were apathetic on the general question of absenteeism. The root cause was however not determined. It could for example have been related to the question of whether or not their (sic) was incentive in the contract' (p.56/7) (emphasis added).

It should be recalled that Sullom Voe was characterised by the use of reimbursable contracts. The point concerning the lack of knowledge of contractors is echoed in the evidence of Marshall of the CEGB to the Sizewell Inquiry :- 'absenteeism statistics have often been very difficult to obtain from contractors'(day 80:para 75).

The sum of this is to suggest that whilst it is evident that high absenteeism was endemic in this period and that it had a negative effect on progress, this occurred in a particular material context set by contractors' use of overtime, and further this absenteeism went largely unchallenged by contractors. This interpretation finds support in the discussion of absenteeism by the unpublished 1967 OCPCA report on productivity in which the report 'recommends the general adoption of (written) control

procedures', thus implying that such control procedures were not in general usage. This lack of challenge by contractors must be understood in the context of their strategic emphasis on the commercial arena as their key profit locus.

Time Discipline

Examining time discipline in this period it is appropriate to quote the description put forward by the unpublished 1982 NEDO report on two refinery projects to the effect that the second project 'suffered from the chronic UK difficulty of enforcing timekeeping around mealbreaks'. The contractors' working party into productivity at Baglan Bay examined the time losses at each part of the day and stated that 22 minutes were lost at the start of the day due to clocking, changing, washing and collecting tools, 25 minutes at the tea break due to work slowing and walking, 37 minutes at the meal break for the same reasons, 10 minutes due to toilet visits, and another 22 minutes at the end of the day. This aggregates to a total of two hours lost (including the actual paid 10 minute tea break). Whilst there is no evidence on how these statistics were compiled they are suggestive of the levels of potential time loss.

The 1976 NEDO report reports the results of activity samplings taken on six UK sites. These results are shown in table A.8.. The active period, that period defined as 'the daily period during which under normal circumstances construction should be observable.... (excluding) all official breaks such as lunch and

tea breaks, washing periods, walking time etc.' constituted on average 87.4% of the paid day (p.24). Further, within this active period an average 35.8% of time was spent 'not on plot', which was a 'residual category calculated by deducting the observed number of men on each round of observations from the potentially observable labour force provided each day by the contractor' (p.26). The report continues :- 'not on plot' measures time away from the plot for whatever reasons, but there is a strong presumption that some of this absence is illegitimate' (p.28).

TABLE A.8. 1970 NEDO Report - Activity Sampling Surveys:
Percentage of Active Period Spent on Each Activity
by the Potentially Observable Labour Force

Activity	Sites					
	UK1	UK2	UK3	UK4	UK5	UK6
Construction Work	17	44	38	27	25	31
Movement	11	11	15	16	13	17
Miscellaneous	20	27	26	24	27	32
Not on Plot	52	18	21	33	35	20

Labour resistance to the discipline of the clock and their self-activity in seeking control of their own time played a major part in this. At a stage 3 meeting at Baglan Bay in 1971 it was reported that there had been sympathy action over the dismissal of three men for clocking out at noon on Friday. The contractor

concerned agreed to re-instate the men but refused to reimburse wages. The FTOs stated that 'the men were arguing that there is a right to clock out'. Determined unilateral action by the workforce in taking an afternoon as well as a morning tea break was recounted by a delegate at the 1967 AEU-CS conference :-

'we intended to take the afternoon tea break on the job I was working on. We were penalised in working 40 hours a week, by losing the tea break and the men were suspended for the rest of the day for taking the break. There was a meeting of the lads and 87 voted in favour of taking the break. Br. Baldwin read the riot act, and said that we would get no support from anybody. This happened a few times in a few days. In the end the lads said 'we will have a tea break in the afternoon. If the executive council don't support us we can't help it. We will not give away this condition'. We took that decision and because of that the whole of the labour force was discharged'.

In the Baglan Bay December 1969 stage 3 minutes it was noted that there were to be no facilities to purchase tea, and that contractors would 'issue men with flasks which they fill themselves before arriving'. In the September 1971 notes of the meetings of contractors' working party into productivity it is stated that 'the site managers referred to the minutes of early 1970 on the subject of tea flasks and our attempts to get this into operation'; there was a compromise 'to put it back into the changehuts which is actually taking place now'. In an interview

with the Baglan Bay boilermakers' union FTO it was stated that 'the lads didn't like flasks. The longest lasting flask was approximately 36 hours, and because of the massive cost of replacement the contractors gave up. There was no need to organise this resistance, it was spontaneous'.

It is likely that such instances of overt conflict and resistance were the exception. There is good reason to believe that the form of de facto deterioration, as described in the minutes of a 1969 contractors' meeting concerning the Grangemouth site, was more common :-

'the meeting agreed that a most disappointing situation had been reached by the site agents. When the agreement was negotiated it was not intended that the morning break would be a breakfast break, merely a tea one. It was also agreed that such a break would be taken in the work area, and a stage 4 meeting confirmed that suitable and adequate cover should be provided for this purpose. The meeting agreed to write to the ETU FTO detailing this and to formally state that there was no obligation on part of the contractors to supply food facilities during the tea break'.

The previous analysis of contractors' practices in this period has indicated that such a situation may have developed without any form of challenge by contractors, particularly under a reimbursable contract. In this regard it is significant that it

was only after the client initiated an investigation into productivity at Baglan Bay that the levels of non-productive time were recognised as a problem. Contracts at Baglan Bay were mainly reimbursable in nature.

Wet Weather Working

There is evidence that on occasions the amount of time lost to inclement weather conditions could be considerable. At the 1970 wage negotiations at Grangemouth the contractors stated that 'the men seem not to merit working in slightly immoderate weather. The vital issue is whether it is raining or not.... (the contractors) are constantly bedevilled with this question'. At a 1977 stage 3 meeting at Seal Sands the contractors stated that 4.5% of hours had been lost to 'wet time' 'since the commencement of the project'. The unpublished NEDO report on the two refinery projects reported that 3% of hours were lost for inclement weather for the second project. In relation to their activity sampling of site work the 1976 NEDO report stated that 'it was noticeable to the observers that there is a lower propensity to work during damp weather on UK sites than on those overseas' (p.28). These figures should be taken as suggestive rather than precise indicators.

There is evidence that the self-activity of labour is an important factor, but to fully understand its manifestation in this area it is necessary to place it in the context of capital relations.

The level of resistance to working in the rain is indicated by the statement by the General Secretary of the AEU-CS at a 1968 stage 4 national meeting with regard to the BP site agreement :- 'he could not accept that his members should work in the rain, even though issued with protective clothing, and indicated he would take strong action if he found a continuance of this attitude being adopted by contractors, which was against his trade union's national policy'. The refusal to work in the rain still appeared to be strong in Grangemouth in the mid-70s according to the minutes of a 1976 stage 3 meeting, in which the FTO stated :-

'the work required the use of a winch which had rain water running onto it. The winch operator was offered protective clothing but there was a clear understanding that in normal circumstances riggers/erectors would not be required to work in the rain. This was recorded in the stage 4 minutes of 8/11/68. The men, therefore, asked for alternative work which would not involve a winch driver doing work in the rain but this was refused and although the man remained available for work, the Employer withdrew the productivity allowance as a disciplinary measure.... The Contractors replied that they were well aware of the official policy of the AUEW (Constr. Sect.) regarding work in the rain. In this case however, the winch driver had been prepared to put on protective clothing to operate the winch for some ten minutes only so that work could proceed'.

There is evidence that AEU-CS resistance to working in the rain was stronger than in other unions. At Baglan Bay the 1970 report by the Secretary to the contractors' group to the Department of Employment and Productivity regarding the effectiveness of the site agreement stated that :-

'most contractors said that the productivity allowance was effective in inducing men to work in marginal conditions and recorded a modest improvement in this field, with only one exception. This improvement did not include the CEU whose attitude to working in marginal condition continued to be generally intransigent. Some progress has, however, been achieved in that the CEU have on occasions unloaded lorries in damp weather'.

As well as there being a difference of practices amongst unions there is also evidence of a lack of uniformity among contractors. At a 1969 national stage 4 meeting on Grangemouth there were discussions surrounding the dismissal of 49 AEU-CS riggers. The FTO stated that 'it was against his union's policy to work in the rain, unless it was work of an emergency character.... he said the problem regarding rain only seemed to occur with Mathew Hall'. The notes of a 1978 contractors' meeting regarding Grangemouth show a discussion of a 5 week strike :- 'Laings said that the strong support given to the strike might indicate that there was something in the men's allegations regarding the wet weather practices of other contractors. There was strong pressure from the client for the monitoring of inclement weather

practices'. An example of the sort of covert agreement between the cabin and individual contractors which lay behind this conflict is given in the minutes of a stage 3 meeting held a month later - the contractors stated that 'the labour force.... were insisting that if some men were out working on dry jobs the remainder in the cabins should be paid the full site rate. It had also been alleged that previously men were required to remain 20-30 minutes in local shelter and then were allowed to return to the cabin on full rate. The site agreement specifically precluded this'.

The 1967 unpublished OCPCA report on productivity argues that in regard to time lost to poor weather 'managements do not pay enough attention to alternative employment'. This a useful insight. The effect on progress of the cabin refusing to work in the rain would be mitigated if contractors planned ahead such that alternative productive work under cover existed. Given the evidence elsewhere on the contractors' lack of emphasis on production planning it is appropriate to argue that alternative productive work would rarely be available.

Finally, it is also appropriate to argue, as with the issue of time discipline, that in situations of reimbursable contracts, or situations of instructions to accelerate - situations which were common, and deliberately made common by contractors, in the period - contractors would have little incentive to challenge the autonomous regulation of the cabin with regard to wet weather working practices.

The discussion of absenteeism, time discipline and wet weather working undertaken by this section has shown that the self-activity of labour in the arena of work control directly contributed to low labour productivity. The self-activity of labour occurred in a material context set by the contractors' emphasis upon the commercial arena as the main profit locus. Further, the very practices of labour which contractors allowed in the material context of reimbursable contracts and instructions to accelerate were used by contractors to justify the reproduction of this form of contractual relationship.

1980s

The picture of labour relations and economic performance in the 1980s which emerged in chapter 8 was that the fall in opportunism, the recession, and the NAECI played important roles in cutting the levels of militancy. The fall in militancy meant that 'blaming labour' was no longer available to contractors as a tool in their commercial relations with clients. Further, the NAECI had direct commercial implications. The evidence on absenteeism, time discipline, and wet weather working confirms this picture.

Absenteeism

The high levels of absenteeism in the 1960s and 1970s were noted above. This was related to the existence of reimbursable

contracts, and the systematic and widespread use of overtime. The picture was one of workers using absenteeism to regulate their hours and earnings whilst contractors had little incentive or ability to manage the absenteeism problem.

It is difficult to give a definitive picture of absenteeism in the 1980s, in that there was no central recording of absenteeism levels for projects, and post-job reports by PJCs also failed to report on levels. The one instance where a project's high level of absenteeism was discussed by the NJC was that of project A in 1991. The client met with NJC members and described the 'high' levels of absenteeism on the project - between 6.5% and 7.5% in 1990 and 1991. This instance stands in contrast to the 1970s projects with absenteeism between 8% and 18% which were discussed above. It appears that the chronic absenteeism of the previous decades had been ameliorated.

This improvement can be explained by the fall in overtime in the early part of the decade, the absence of reimbursable contracts in the 1980s and the increased information flow which stems from the NAECI auditing provisions. Contractors are required to report monthly levels of absenteeism on audit forms which are subject to PJC, NJC and client inspection. Whereas in the 1970s it was common for neither the contractor nor the client to have any knowledge of absenteeism levels, in the 1980s the NAECI ensures the existence of such information.

An important echo of the previous decades, however, was that it

was the client at site A, and not the contractors, who was concerned with high absenteeism. The client (and contractor lack of) concern is intimated in a 1991 letter from the client to the NJC Director which states, 'we shall be of course be discussing these statistics [on absenteeism] with the Contractors Group'. This tends to confirm the picture of the contractors' continued lack of focus upon productive efficiency.

Time Discipline

It was argued above that considerable production time was lost at the beginning and end of the work day and at tea and meal breaks. This was related not only to labour militancy in the sphere of work control but also to contractor non-enforcement in the context of reimbursable contracts and instructions to accelerate.

Given evidence in chapters 5 and 6 that contractors largely continue to stress the generation of additional payments, it can be expected that a substantial change is unlikely to have occurred. The evidence does not paint a clear picture but can tentatively be interpreted as supporting this expectation.

Whilst the introduction of electronic card swiping instead of mechanical card pushing on 2 projects in 1987 as well as at site D in 1991 imply a greater enforcement of time discipline, especially as the clocking also applied to the meal break, there are other pieces of evidence which tend to contradict this. The

PJC minutes of a site on which there has been continuous construction for the decade reveal a slackening of enforcement. In 1983 at a contractors' group meeting 6 of the 14 contractors stated that their workforces took their tea at the immediate place of work, but in 1987 the client stated that at the beginning of the decade tea breaks were taken 'in very close proximity to the place of work' but that increasingly this was no longer the case.

Further, at site C the first contractors on site had not operated the new NAECI provisions on 'bell to bell' working concerning the changing into work clothes after clocking out. One contractor attempted enforcement of the provisions, which led to labour force resistance in the form of unilateral changing of work clothes before clocking out. At this point the other contractors had still not attempted enforcement. The client then pressured the contractors to enforce in unison. The interpretation of the client's industrial relations officer was that 'without client intervention, left to contractors, bell to bell would have withered and died'.

A similar theme of the client pressuring the contractors to enforce time discipline, with the corollary that without client pressure enforcement of time discipline is low, was manifest on site A. The Director-level client official responsible for the completion of the construction project had visited the site and had been so 'appalled' at the lack of work activity some ten to fifteen minutes after the lunch break period that he called an

immediate meeting of site managers to criticise them for allowing this situation and to demand an improvement. Similarly, the industrial relations officer of the managing contractor on site D noted that 'a constant bollocking of construction management was needed regarding the morning and lunch breaks'.

Before bell to bell provisions introduced in 1990 the NAECI had no role in aiding the tightening of time discipline. In 1982 there were two references from contractors to the national level, stage 4, of the disputes procedure seeking a reduction in 'walking time'. Similarly, the union side pursued a reference to stage 4 in 1983 against the introduction of mechanical clocking on one site. The panel supported the union case .

The panel rejected these attempts to tighten time discipline because of the explicit understanding between the contractors and the union that the NAECI would not be used to undermine existing custom and practice in certain areas, which emerged primarily to be demarcation and time discipline. This limitation on the scope of the NAECI should be seen as flowing from the limits on the autonomy of the national union officials. Given the, at best, lack of enthusiasm of their members for the NAECI, there were limits beyond which they could not go despite the reversal in the flow of authority and the growth of representative democracy.

The 1990 NAECI bell to bell provisions emerged from the contractors' reaction to the union demands for a cut in the working week from 39 to 38 hours, with the tightening of time

discipline seen as a compensatory device. As such it would be difficult to interpret an attempt to enforce it as a sign of an increasing emphasis among contractors on the efficient organisation of production. At sites B and D it was being tightly enforced from the start of the projects. Its introduction at site A was described above. At site A the client had made the decision that there would be no attempt to enforce the provisions given that strong labour resistance would be expected, as the labour force had already been well established on site under the old conditions. The labour force was still relatively small and new on site C when bell to bell had been introduced and it had engendered resistance as described earlier. Three mass meetings were called on the subject and there was a unanimous vote that if anyone was dismissed over this there would be a site-wide walk-out. In addition this spurred the formation of a shop steward committee on the site.

The lack of resistance at sites B and D can be related to the fact that in both instances the client or managing contractor took into account the operation of bell to bell working in the design of the site lay-out, in the design of the project itself. On being asked whether the NAECI provisions had affected decisions concerning design and lay-out, the industrial relations manager of the client at site stated that 'it certainly concentrated our minds on the issue'. Here, there is another strand in the relationship between the labour relations and commercial arenas such that institutions of labour relations inform the realisation of the economic improvements through the

integration of design and construction. It will be recalled from chapter 6 that the form of low trust conflictual capital relations militated against such an integration.

An example of the lack of the integration of design and construction and the problems that this can cause for the management of time discipline was evident at Heysham 2 power station. The post-job report prepared by the PJC notes that 'a considerable amount of unrest occurred when it was decided that clocking stations.... must be moved to the 4.5 metre level.... The unrest was not created by the move itself, but by an inability to move men in large numbers to and from the work areas without frustration'. This was in part due to 'insufficient hoist capacity to cater for the large numbers involved'.

Wet Weather Working

Above it was indicated that in the 1960s and 1970s significant time could be lost due to 'inclement weather conditions'. This was related to cabin militancy in the context of reimbursable contracts, and the failure of contractors to plan alternative work under- cover.

The problems with evidence which were discussed under absenteeism also apply here. Despite the lack of systematic data on time lost to the weather conditions, there is evidence on one case, namely, the PJC post-job report on the St. Fergus project which describes 0.8% of hours lost to the weather as 'substantial'.

This indicates that there has been a drop in the hours lost because this level in the 1960s and 1970s would have been regarded as modest. At St. Fergus the NAECI played an important role in limiting and channelling the cabin militancy :- 'four cases were taken to stage four regarding inclement weather, and evolved around whether the workforce or the management decided when they cabined up in event of inclement weather. It was extremely difficult to get this message (i.e. management prerogative) across to the workforce'. The NAECI explicitly grants managerial prerogative on this issue and states that workers must work in the rain in protective clothing. The auditing provision is also important in that the client or managing contractor has knowledge of levels of time lost. The problem of getting across the message of managerial prerogative is intensified when the contractor is unwilling to use the NAECI provisions, and allows a position where in light rain, 50% continue to work, 50% stay in the cabin, and all the workforce are paid the full bonus. This was the case for contractor D.a..

Conclusion

This appendix has provided additional evidence on important areas of work control. The evidence confirms the arguments of chapters 7 and 8 that in the 1960s and 1970s the high levels of labour militancy had to be understood in relation to the emphasis of contractors on profit outwith production. The fall in militancy in the 1980s in effect facilitated the curbing of contractors'

opportunism by blocking the previous ability of contractors to blame slow building on recalcitrant labour.

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