Decentralized Decision-Making and Group Incentives in British Manufacturing Establishments 1992-1995 and a British Retail Firm 1998: Recent Econometric and Case Study Evidence

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Abstract

Researched in this thesis is the financial impact of employee involvement and performance-related pay systems in UK manufacturing and retail settings. The test questions are introduced in Chapter 1 along with some micro- and macro-level factors which may make it efficient to involve employees in decision-making and to pay basis performance. Chapter 2 discusses theoretical issues associated with involving employees in decision-making and using group-based incentives. There is support from both the theoretical and empirical literature that employee involvement and performance-related pay are more efficient when used in combination. Chapter 3 evaluates methodological issues associated with the examination of these questions, including methods used to attribute for unobserved heterogeneity and endogeneity in the econometric analysis. In Chapter 4 case study evidence is gathered from the retail sector on the adoption of, and associated performance trends with the use of, an All Employee Stock Option Programme (AESOP) and extensive employee communication programmes. Sources at the company indicate that the use of these practices are thought to result in greater employee effort and efficient information sharing. Performance trends, since the adoption of these programmes, indicate improved performance within the company and relative to competitors which do not offer an AESOP. Econometric analysis is used in Chapter 5 to examine the financial impact of individual, team and group pay systems in UK manufacturing establishments where there is work task 'interdependence'. Evidence is found that in team production settings group payments systems are the most efficient pay system. Chapter 6 examines the impact of two forms of employee involvement, decentralized decision-making and two-way information sharing, on establishment performance. These practices are examined both including and excluding incentives. A statistically significant impact on establishment performance is found when performance-based incentives are *included*: this result disappears when the incentives are *excluded*. A second econometric analysis is conducted in Chapter 6, evaluating the independent and interactive effects of decentralized decision-making and group incentives in team production settings. Evidence is found that sub-optimal performance results in establishments which use *only* decentralized decision-making or *only* group incentives. Establishments that use the practices in *combination* have the best performance. Chapter 7 is the summary and conclusion.

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Dedicated to

My Mother,

and

In Memory of My Father

"I got thinkin' how we was holy when we was one thing, an' mankin' was holy when it was one thing. An' it on'y got unholy when one mis'able little fella got the bit in his teeth an' run off his own way, kickin' an draggin' an' fightin'. Fella like that bust the holiness. But when they'll all workin' together, not one fella for another fella, but one fella kind of harnessed to the whole shebang - that's right, that's holy."

The Grapes of Wrath by John Steinbeck

Chapter 1

Introduction

1.1 Overview

Globalisation, reduction in communication and transportation costs, technological change, international trade, product market competition, the growth of service and 'weightless'[1] industries are all having an enormous impact on the workplace and the employment relationship. On the micro-level, information technology, greater individual training and higher levels of educational attainment may be putting greater amounts of potentially productivity-enhancing information at the disposal of employees. One result of these macro- and micro-level changes, in the manufacturing sector, is that the production process is changing from a primarily individually oriented *'hierarchical'* division of labour, to a much more team-based approach where there is a high degree of *'interdependence'* among work areas (Piore, 1989). Additionally, due to an increase in human capital and information technology 'efficiency-enhancing information', which resides with employees, may be more prevalent than ever. In order to gain access to this information companies are increasingly developing and putting in place formal mechanisms and programmes such as employee involvement programmes, decentralized decision-making and two-way communication programmes. An implication associated with an increase in private information is it may become more difficult and expensive for companies to monitor employees to ensure that they are acting on this information in a way that maximizes the companies' performance or profits. Additionally, without incentives, there may be little motivation for employees to communicate this information to those who may find it valuable.

[1] See Quah (1998) for a more thorough description of the 'weightless' economy and industries.

A cost-effective substitute for formal monitors may be incentives based on some measure of output such as performance rather than input such as time spent on the job.[2] There is an increase in the usage of these forms of performance-related pay systems such as individual merit pay, individual bonuses, team-based pay and various forms of group-based incentives including profit-sharing and share ownership schemes that may further suggest companies are attempting to access private information cost efficiently.

Given these factors, companies are faced with the question, what is the most efficient way in which to structure the employment relationship? Two core practices that are becoming more prevalent, and the subjects of this thesis, are employee involvement programmes and performance-related pay. The general question evaluated and tested in this thesis is - *In team production settings, where employees may have information from which the company could benefit, what are the most effective ways to structure human resource practices?* More specifically, the following questions are evaluated:

i. From the perspective of the company, why would they choose to use profit-sharing and employee involvement programmes? What would they hope to gain and does the firms' performance change after the introduction of these programmes? How well are they performing in relation to firms which do not use these programmes?

ii. What form of pay system promotes optimal establishment outcomes? In team production settings, are individual, team or group incentives most effective?

[2] The substitutability of incentives for formal monitors is discussed in both the theoretical Chapter 2 and the empirical Chapters.

iii. In settings where the product produced or the service given are dependent on team production or *interdependent* work processes, is it efficient for establishments to invest in decentralized decision-making and information-sharing? Is it efficient to use employee involvement and performance-related pay on their own or in combination?

Focussing on pay systems, primarily group-based performance-related schemes and on employee involvement programmes, in particular decentralized decision-making and employee communication programmes, this thesis explores these questions theoretically, practically and empirically.

1.1.1 Chapter Plans

To explore these questions this thesis will move from the general to the specific using both case study and econometric analysis. Starting in the introduction, some key concepts and the trends affecting employee involvement and group-based performance-related pay will be presented. In Chapter 2 a broad overview of theoretical concepts related to these questions and an empirical review of the research that has explored these issues is considered. Chapter 3 evaluates some methodological issues associated with an examination of the questions explored in this thesis. Within Chapters 4, 5 and 6 specific theoretical and empirical considerations will be evaluated. Chapter 4 presents a case study of one of the first firms in the UK to offer executive style stock options for all employees. Also examined in Chapter 4 is the extensive use of two-way employee communication programmes in the same firm. The intention of this case study is to obtain information on one firms' experience with group incentives and programmes designed to give both employees and management access to useful information. The questions examined in

Chapter 4 are, why would a company choose to put these practices in place, and is there any evidence that they may be having a positive effect on the company's performance? The evaluation draws upon both the theoretical considerations and interviews conducted with management at the case study company as to why they choose to place these programmes in place and what they hope to gain. Changing from the service sector to the manufacturing sector, and from the firm level to the establishment level, the econometric work begins in Chapter 5. Narrowing the focus specifically to the evaluation of pay systems in production settings in which the production process is largely interdependent, Chapter 5 evaluates the impact differing forms of performance-related pay systems have on establishment performance. First evaluated in Chapter 6 is the question, do two-way communication programmes or decentralized decision-making have an impact on performance? Initially, decision-making and financial participation are not isolated. The second set of regressions does eliminate the use of financial participation with employee participation. This is followed with an isolation of the impact establishments which use *i) only* a high degree of decentralized decision-making ii) only use group incentives and iii) only those establishments which use the two practices in combination. This separation of the various types of practices by establishment will enable an evaluation to determine both the independent and interactive effects of decentralized decision-making and group incentives on establishment performance. Chapter 7 is a review and conclusion of the thesis and Chapter 8 is the references.

1.2 Terminology and Concepts

1.2.1 Principals and Agents - Residual Return and Control Rights

Principal and Agents or Owner and Non-owners

Throughout this thesis I will be referring to *'principals'* and *'agents'*. The principal is the 'owner' of capital able to exercise decision-making rights regarding any residual profits and the right to decide how the assets are to be used. The 'agent' is the 'non-owner' and is employed by the principal to carry out some service or economic activity. However, the line between 'owners' and 'non-owners' is becoming increasingly blurred. More non-owners are becoming shareholders and becoming increasingly involved in organisational decision-making. Within the context of this thesis, non-owners, are those who have access to information that could improve efficiency, but who do not have access to the two rights of ownership, i.e. *'residual return'* and *'residual control'*.[3]

Residual Return and Residual Control Rights

There are two principal rights of ownership: the right of residual return, which is the right to any residual profits after all obligations have been met, and the right of residual control, which is the right to control what is done with an asset. Examples of sharing residual return rights with 'non-owners' are profit-sharing plans, share ownership or stock-option plans. Sharing residual control rights may consist of granting 'non-owners' a high degree of autonomy over the work process or employee involvement programmes such as information-sharing programmes.

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[3] The concept and definition of 'residual return' and 'control rights' are the same ones largely used by Milgrom and Roberson (1992) and Ben-Ner and Jones (1995).

This thesis will focus on certain forms of residual control and return sharing practices that will be more thoroughly discussed in the theoretical chapter and tested in the empirical work. The definition of 'non-owner' is broad and may include both senior management and shopfloor workers. However, it is unlikely, that senior management would not have access to residual return rights, for example in the form of stock option or some form of performance-related pay. 'Owners' are those who have the right to residual return and residual control and 'non-owners' are those who do not share in these rights.

1.2.2 New Economics of Personnel or the Strategic Choice Literature

The relatively recently coined terms the 'New Economics of Personnel'[4] or the 'Strategic Choice' literature recognize that firms have a choice regarding which management practices they put in place. Economists and industrial relations professionals have increasingly become interested in what goes on inside the 'black box', i.e. the firm. This interest has largely been focussed on the impact different compensation or remuneration programmes have on a firm's performance. Recently this has extended to other human resource practices including the impact of 'combinations' (Huseslid, 1995; Ichniowski, 1990) or 'systems'. This view suggests that firms make choices regarding how they structure their human resource policies, some of which work, some of which do not. Theory can tell us much about how the world works, however, not everyone acts in that way, so there is a role for economists and industrial relations professionals to steer firms in the right direction. This does not mean the 'one size fits all' mentality is being advocated; in fact, exactly the opposite view is supported in this thesis. There may be certain

[4] See the October 1987 issue of the Journal of Labor Economics for an overview of the 'New Economics of Personnel'.

firms or establishments with certain types of employees which may benefit from using a particular set of practices. This would mean those firms with a different set of characteristics and a different set of employees may benefit from a completely different set of practices.

1.2.3 The Economic Impact of Human Resource Practices

There is increasing evidence that human resource practices, such as pay systems, have an impact on the performance of the firm (Hueslid, 1995; Ichniowski 1990). In many companies the labour costs comprise a substantial portion of business costs. The impact on the success of an enterprise of efficiently organising a firm's human capital may be substantial. Take for example a fairly labour-intensive business where 80 per cent of the costs of doing business is associated with labour costs and 20 per cent is the cost of capital. If it were possible to make labour ten per cent more efficient and what was accomplished in 66 minutes could be accomplished in 60 minutes, there would be an increase in output of eight per cent. Assuming there were no, or little, set-up costs, even if five per cent of those gains went to employees, owners would be three per cent better off. The cost of labour and capital vary enormously by firm, industry and sector. In those firms which have a high level of labour costs and where inputs from labour are crucial for the product or service provided, the gains from increasing the efficiency of the workforce may be very substantial.

In order to explore the impact of human resource practices on firm performance both the retail and manufacturing sectors are evaluated. A case study will be conducted in a service sector retailer which uses an executive like stock options for all employees and also invests heavily in obtaining information from front-line employees. The econometric analysis of this thesis will

be conducted using data on shopfloor workers in manufacturing establishments which are mostly small-to-medium sized and hire skilled employees. These two settings are ideal for addressing the questions which are examined in this thesis. In the manufacturing setting, given the high skill levels and technological sophistication of the workplaces, there may be considerable scope for the shopfloor workers to influence performance. Additionally, manufacturing settings provide tangible measures of output which allow better performance measures. In the retail setting, while the employees may be considered low skill, they are in a position where, given their proximity to the customers, they may have access to highly useful information, for example, on customer preferences. It is more difficult to find viable performance measures in the service sector: however, comparison to performance measures prior to and after the programmes of interest are put in place, and comparison to firms in the same industry which do not offer these programmes, may provide information on their effects.

1.3 Changes in the Macro and Micro Economic Environment

Increased Levels of 'Information Capital' due to Information Technology

One fundamental change in organisations with enormous implications for both coordination and incentive mechanisms is the advent, and continued development of, information technology. The impact of the personal computer on the way in which work is carried out is enormous. Word processing and spreadsheets are part of most people's working lives. Local area networks (LANs), groupware, intranets and ISDN lines are tools which aid communication and information-sharing and all are becoming increasingly common in the workplace. Additionally, there are automated work flow process systems which carry out simple tasks as well as autonomous and intelligent agents which are capable of mining data for pertinent information

and also capable of conducting analysis of that data. The internet and corresponding search engines are putting individuals closer to ever increasing amount of information. The internet will continue to have the effect of increasing the level and type of information at the disposal of individuals and teams. Graph 1.1 shows the percentage increase in computer usage between the years 1986 and 1997. There has been a substantial increase in the level of computer usage in the UK between the 1986 survey and the 1997 survey.

Increased 'Human' Capital

While technology is increasing the information which individuals have access to, individual human capital is also increasing. This is evident due to an increase in the educational attainment which is taking place (graph 1.2) and the amount of firm-specific and general training which is taking place (graph 1.3). Regarding educational attainment, we see in graph 1.4 that there is an increase from 22.5 per cent in 1986 to 28.5 per cent in 1997 of the workforce with qualifications.

Work Organisation Change from Division of Labour to Team-Based Approach

Piore (1989) shows that there are a number of changes occurring in manufacturing settings which have a considerable impact on the way in which work is carried out. Piore contends that there is a change from hierarchy based on division of labour to team-based organisations. This is largely associated with the advent and proliferation of Japanese style 'Just-in-Time' management. This form of management is characterised as being associated with a reduction in '*in process inventory*'. According to Piore, the movement towards this form of workplace design has had important implications for the relationship among workers and work stations. The change, according to Piore, is from *'isolated'*, independent operations to intense interaction between adjacent operations. This change in manufacturing settings is also reflected in the adoption of

'flexible' work practices such as contingent pay, multi-skilling and a high level of employee involvement (Osterman, 1994).

Private Information

Another change in the economy which has been taking place for five decades in the developed world, and at a significant but slower rate in developing economies, is the rapid expansion of the service economy. There has been much concern about the loss of higher paying manufacturing jobs to the low wage service sector (Machin, 1996); these jobs often require a low skill level and pay a low wage. Typical low wage service sector jobs are till operators at fast food restaurants, check out clerks at supermarkets or telephonists at call centres. In the case of the service sector, many jobs put the workers in direct contact with customers; this should put them in the position where they may have access to information regarding customer preferences or other information concerning how to best serve the customer. The same information trends also apply to the manufacturing sector. Again, given employee's proximity to the work process they may have keen insights into how to make the production process more efficient. As workplace technology, work processes and practices such as multi-skilling and autonomous work practices become more common in manufacturing establishments the same information trends may apply.

Reduced Presence of Unions

While employees continue to have access to private information, there is also a reduction in the institution which had previously promoted information-sharing in the organisation: there is a sizable reduction in union membership. Graph 1.5 shows there has been a decrease in unionization from a high of 53 per cent membership in 1980 to 32 per cent in 1994. One of the principal benefits associated with unionization is the voice component. Medoff and Freeman

(1984) indicate that one of the primary benefits of unionization is that it acts as a mechanism to communicate employee preferences and information to management. With the reduction of the presence of unions, management are looking for other ways in which to access the potential productivity-enhancing information which employees harbour. One way in which this is done is through the implementation of employee involvement programmes.

1.4 Residual Control Rights - Employee Involvement

1.4.1 Type of Employee Involvement Evaluated

One of the principal ways in which firms have attempted to access information is via employee involvement programmes and employee communication programmes (Cotton, 1993). One of the fundamental issues of economic organisation, the coordination function, is closely related to how employees are deployed, organized and involved. The use of these forms of programmes are on the increase in both developed and developing economies. Firms or owners of capital have for a long time recognized that individual employees have access to information from which they (the 'owners') could benefit. Accordingly, over the years, there has developed many different types and forms and means of accessing this private information. These include programmes such as quality circles, teams, autonomous and semi-autonomous work groups and decentralized decision-making. In addition, in parts of Europe, there is a tradition of co-determination and board level employee representation. While there are many different types and forms of employee involvement, this thesis will be focussing on programmes designed to access information which employees have and the decentralization to employees of decisions previously taken by management.

1.4.2 Trends for Employee Involvement

From the view of the 'Positive Economist' the fact that certain practices are being used may signal that its use is efficient. From this point of view we see that employee involvement programmes are being used more frequently so companies are evidently finding them efficient. One source of information on frequency of practices is the 'Work Place Industrial Relations Survey' (WIRS) which was administered in 1980, 1984 and 1990. According to Brown (1995), the WIRS indicates that 45 per cent of the establishments initiated some form of employee involvement between 1987 and 1990. This shows an increase in the adoption rate of employee involvement programmes which between 1981 and 1984 stood at 35 per cent. Milward et al. (1992) determined that while the overall portion of establishments using employee involvement and communication programmes remained constant at 89 per cent of the establishment, the methods of communication increased from 2 in 1984 to 2.4 in 1990. In the US a survey conducted by Osterman (1994a) found that 45.6 per cent of manufacturing establishments used quality circles and 50.1 per cent used teams. This result in the US was broadly supported by Lawler et al. (1992) who found quality circles in 66 per cent of the top 1,000 firms and work teams in 47 per cent. The 1998 'Workplace Employee Relations Survey' (WERS) in the UK found 65 per cent of the workplaces worked in teams, 61 per cent used team briefings for employees, 42 per cent conducted problem solving groups and 37 per cent had information-sharing sessions for the entire workforce.[5]

[5] For more information on incidence of human resource practices see 'The 1998 Workplace Employee Relations Survey, First Findings'. These findings are based on responses from 1,926 managers in UK establishments with 25 or more employees.

1.5 Residual Return Rights - Group Based Incentives

There are many different types and forms of pay for performance systems: included are piece rates which pay directly for output, individually based programmes such as merit pay and bonuses, which reward individual effort. There are also team-based pay systems which reward the efforts of small teams. In addition, there are pay systems which reward group performance, such as gain-sharing and profit-sharing and share schemes which place shares in the hands of a broad range of employees.

It has been argued that pay systems other than a flat time-rate may elicit increased incentive effects. According to Lazear (1995), if someone was building an economy from scratch it is doubtful that they would put in a pay system which paid for time spent on the job or input, rather than some measure of output. Chapter 5 will evaluate the economic impact which some of these pay systems have on the performance of the establishment. However, the principal focus of this thesis will be on one form of pay for performance, specifically group-wide incentive schemes.

Three types of group incentive schemes are recognized by the Inland Revenue in the UK. These are: profit-sharing, share schemes and stock option programmes. A summary of these programmes are found in table 1.1.

Profit-Sharing

Special tax treatment for profit-sharing plans started in 1979. In order to gain approval for a share scheme a company must establish a trust fund and issue the payments to it directly. Employees do not pay income tax on shares when they are given by the trust. They must agree

to leave the funds in the trust for at least two years. If the shares are sold in the third year there is an income tax of 100 per cent of their value. If they are sold during the fourth year after appropriation, there is no income tax, although there may be capital gains tax.

The schemes are open to all employees of the company for at least five years, whether they are part- or full-time. The value of the shares issued to an employee in any tax year cannot exceed £3,000 or 10 per cent of the employee's earnings.

Savings-Related Share Option Schemes

The present tax relief was introduced in 1980. The employees are given the option (right) to buy shares, at some future date, at a price fixed when the right is given: it cannot be less than 80 per cent of the market price of the share at the time of the purchase. Those participating in the plan need to save between £5 and £250 per month within a saving contract (SAYE) either at a bank or building society: the contract lasts between five years and seven years. After five years the participant can elect to leave the proceeds for another two years. If the choice to leave for another two years is taken the interest accrued over that period is tax free and can be used to buy additional shares. Employees do not have to exercise their options and indeed may not want to if the share price is less than the option price at which they have the right to purchase. If they choose not to exercise the option they will receive the proceeds of the money in the trust plus interest.

An employee does not pay income tax on the bonus, or interest received under the SAYE contract or the increase in value of shares between when the option was granted and the date it is exercised however, capital gains tax may be payable when the shares are sold. SAYE schemes

are open to any employee who has been with the company for at least five years. Other employees may also be included, but all employees who are included must do so on similar terms.

Discretionary Share Option Schemes

Discretionary share option schemes were abolished in 1996. Prior to 1996 employees were given the right to buy options at a future date at a price fixed when the option was granted. The company could decide who was eligible to participate and it was not tied to any saving scheme. The value of the options held by an employee was limited to the greater of £100,000 or four times the person's salary. The option price could be set as low as 85 per cent of market value at the time the option was granted. The employee did not pay income tax on any increase in the market value of the shares when the option was exercised. To qualify for this tax treatment the option could not be exercised less than three years and not more than ten years from when the option was granted. Capital gains tax could apply when the options were exercised.

Company Share Option Plans

Discretionary share option plans were replaced by company share option plans in 1996. While the company is still free to decide who participates in these plans, there is a limit of £30,000 on tax relief. The value of the share cannot be granted below the market price and the tax treatment remains the same as was in effect for Discretionary Schemes.

Table 1.1

Summary of Inland Revenue Approved Share-Based Group Pay Plans

Profit-Sharing	**SAYE**	**Company Stock Options**
Tenure with Company: Company Determined.	**Tenure with Company:** Company Determined.	**Tenure with Company:** Company Determined.
Open to: All full- and part-time employees.	**Open to:** All full- and part-time employees.	**Open to:** Company decides who participates.
Tax Treatment: No income tax paid on shares.	**Tax Treatment:** No income tax paid on shares.	**Tax Treatment:** No income tax paid if less than £30,000.
Holding Obligations: Two years.	**Holding Obligations:** Five or seven year contracts.	**Holding Obligations:** The option must not be exercised less than three yrs. or more than ten yrs.
Limits: Maximum payment of £3,000 or 10 per cent of employees earning.	**Limits:** Maximum monthly contribution £250; minimum £5.	**Limits:** £30,000 exercised at any one time.

1.5.1 Trends for Share-Based Schemes in the UK

In graph 1.6, while the number of plans being approved in any one year has decreased the number of individuals receiving shares in any one year has increased four fold since 1979/1980. This largely reflects the fact that most companies require a vesting period which does not allow a cash- out. The same trend applies in graph 1.7 where the number of newly approved plans has stayed constant at about 100. However, the number of options granted doubles approximately every two years.

Graph 1.8 details the number of profit-related live schemes by industry. There is a considerable take-up in both the manufacturing and the service sectors. In 1991 the number of live plans in both sectors was approximately 1,000. By 1996 the number had grown to approximately 4,000 in manufacturing and over 5,000 in the service sector. The same trend is illustrated in graph 1.9 where the total number of individuals is indicated. Graph 1.10 shows the total number of full-time employees taking up profit-related plans by industry, and graph 1.11 outlines the take-up of part-time employees. While full-time employee take-up is increasing at a fairly constant rate we see that there is a sizable take-up in 1994/1995 by part-time employees. This reflects a new law which made it illegal not to include part-time employees. Finally, in graph 1.12 we see the number of approved 'discretionary' share option schemes. Overall there is a reduction in the take-up of these programmes and a fairly constant rate of granting of the options. Most of the reduction in the take-up of these programmes is attributed to the tax savings being withdrawn and these programmes are largely used as a component of executive compensation.

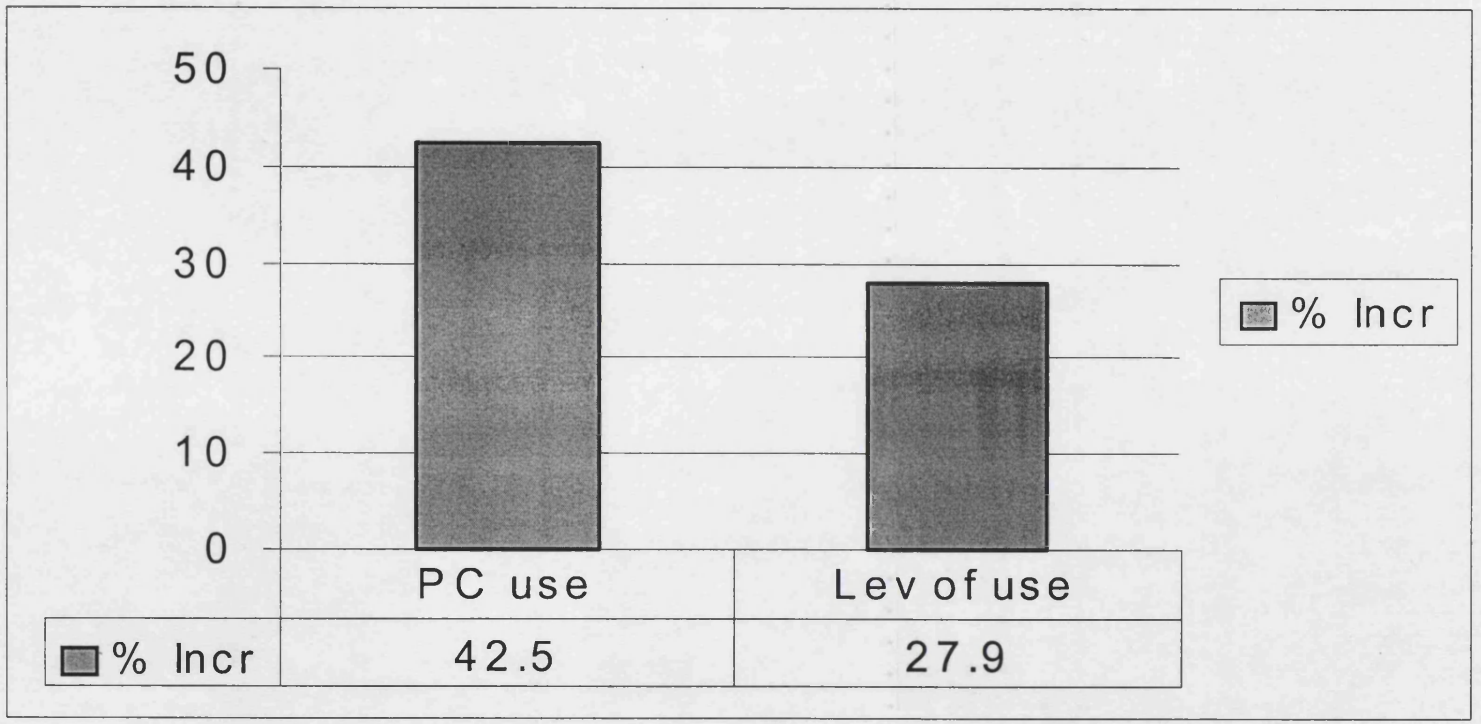
1.6 Chapter Summary

This introductory chapter outlines the main aim of this thesis, that is, to evaluate if it is efficient for companies to invest in employee involvement programmes and group-based incentives. These practices will be evaluated both independently and interactively. In order to evaluate these questions both the theoretical and empirical literature is evaluated and case study and econometric analysis are used.

Covered in this introduction has been the definitions of some key concepts including 'principal', 'agent', 'owner', 'non-owners'. Also discussed is the notion of the 'New Economics of Personnel' which recognizes that companies make decisions about how to structure their human resource practices which may or may not be efficient. An overview of the broad macro- and micro- level trends which are making it increasingly advantageous for companies to invest in employee involvement and pay based on performance are presented. These trends include a greater level of information residing with employees due to greater human capital and more access to information as a result of information technology. In addition, unions which have provided a conduit for information between management and employees, are becoming less prevalent. There is also a change from specialized division of labour in production settings to a much more 'team' production process approach that is interdependent on other work areas. These trends may be making it increasingly advisable for companies to invest in employee involvement programmes and pay based on performance. We see that there is a trend towards the greater use of employee involvement programmes and group-based performance-related pay.

Graph 1.1

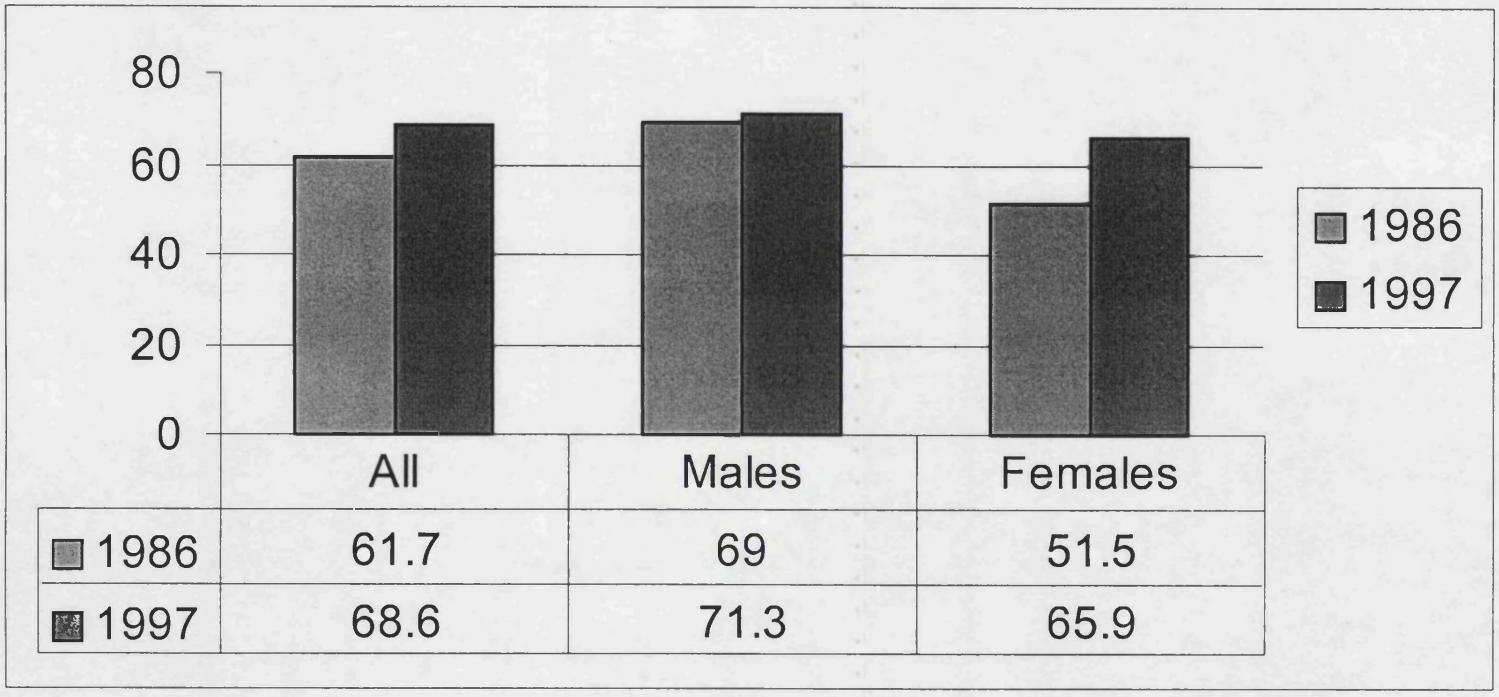
Percentage Increase in Computer Usage and Level of Use in the Workplace Between 1986 - 1997 in the UK



Source: Social Change and Economic Life Initiative, 1986 and Skills Survey, 1997

Graph 1.2

Percentage of Workers in Jobs Where a Qualification is Required to Get the Job

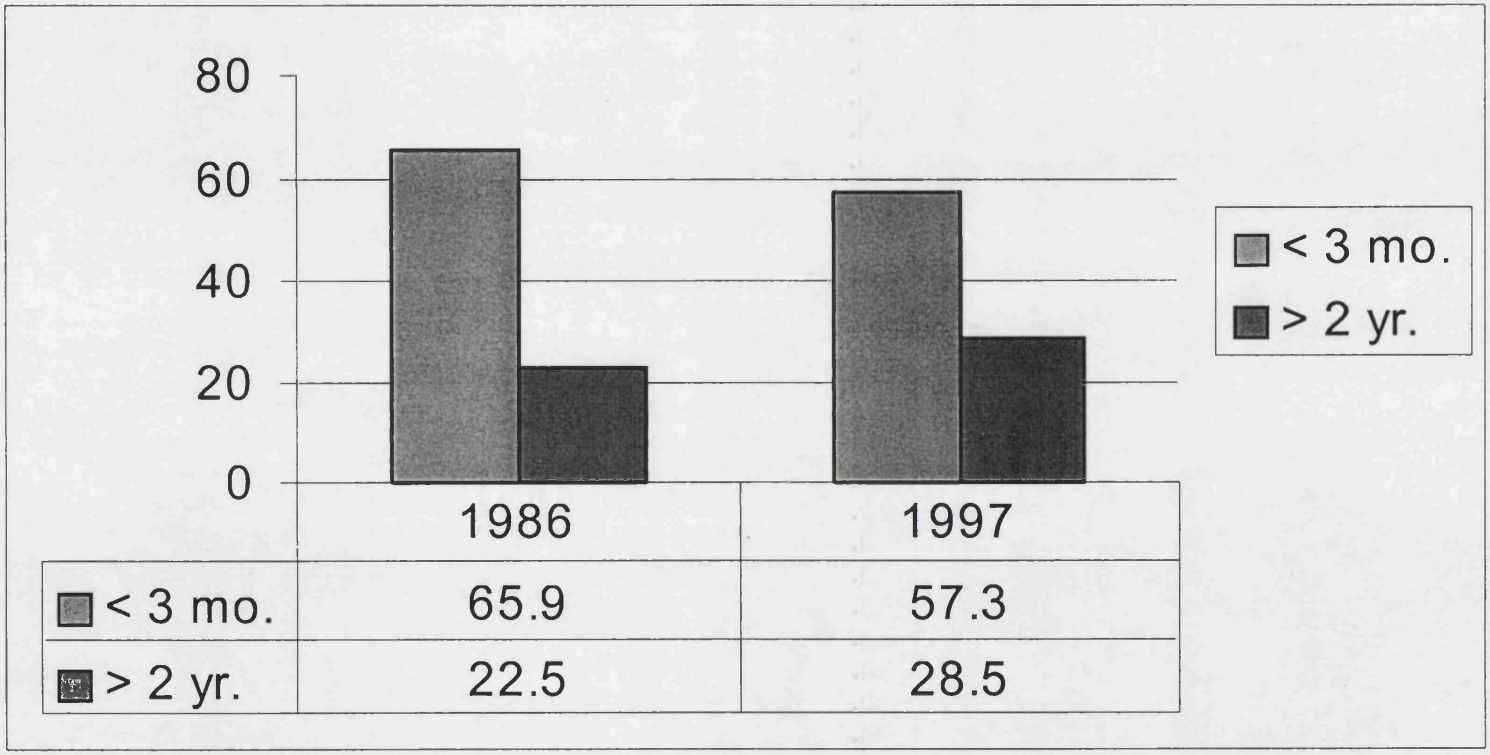


	All	Males	Females
1986	61.7	69	51.5
1997	68.6	71.3	65.9

Source: Social Change and Economic Life Initiative, 1986 and Skills Survey, 1997

Graph 1.3

Length of Training Required to Perform the Job Duties Adequately

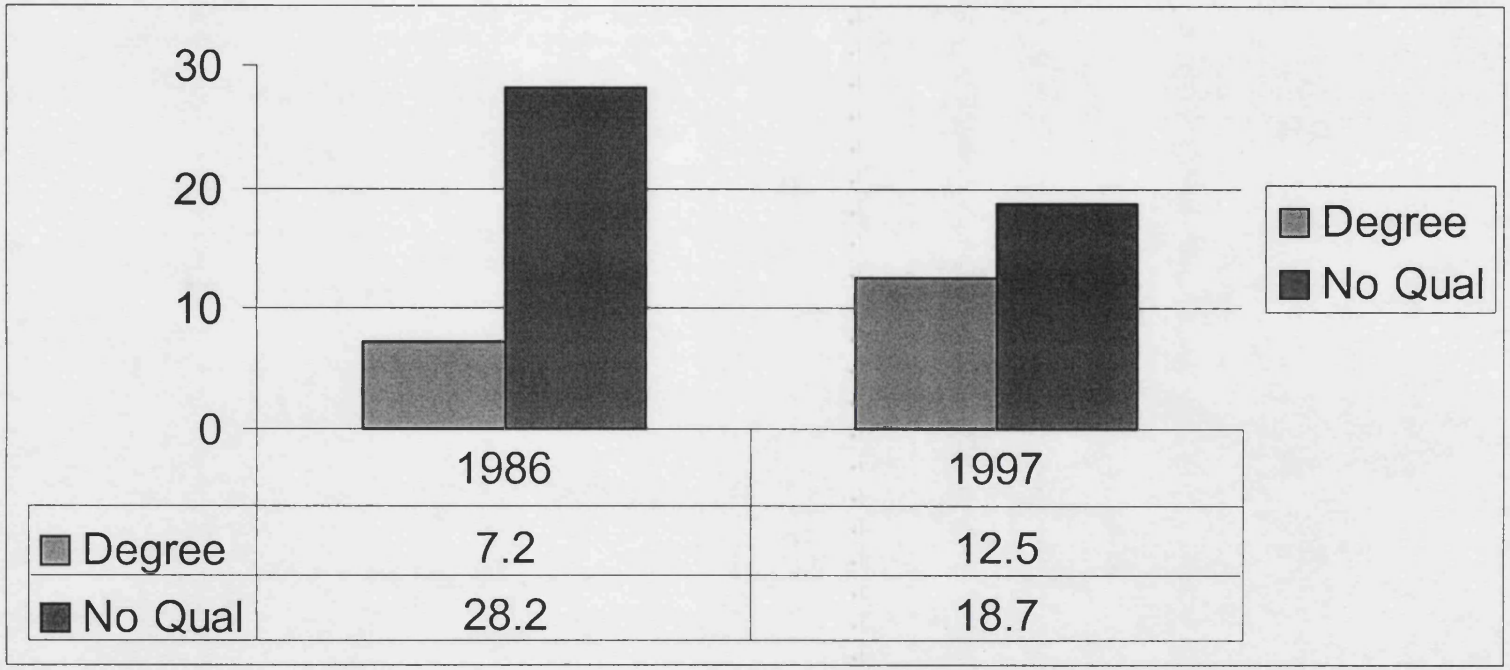


	1986	1997
< 3 mo.	65.9	57.3
> 2 yr.	22.5	28.5

Source: Social Change and Economic Life Initiative, 1986 and Skills Survey, 1997

Graph 1.4

Percentage of Workers with a Degree and with No Qualifications

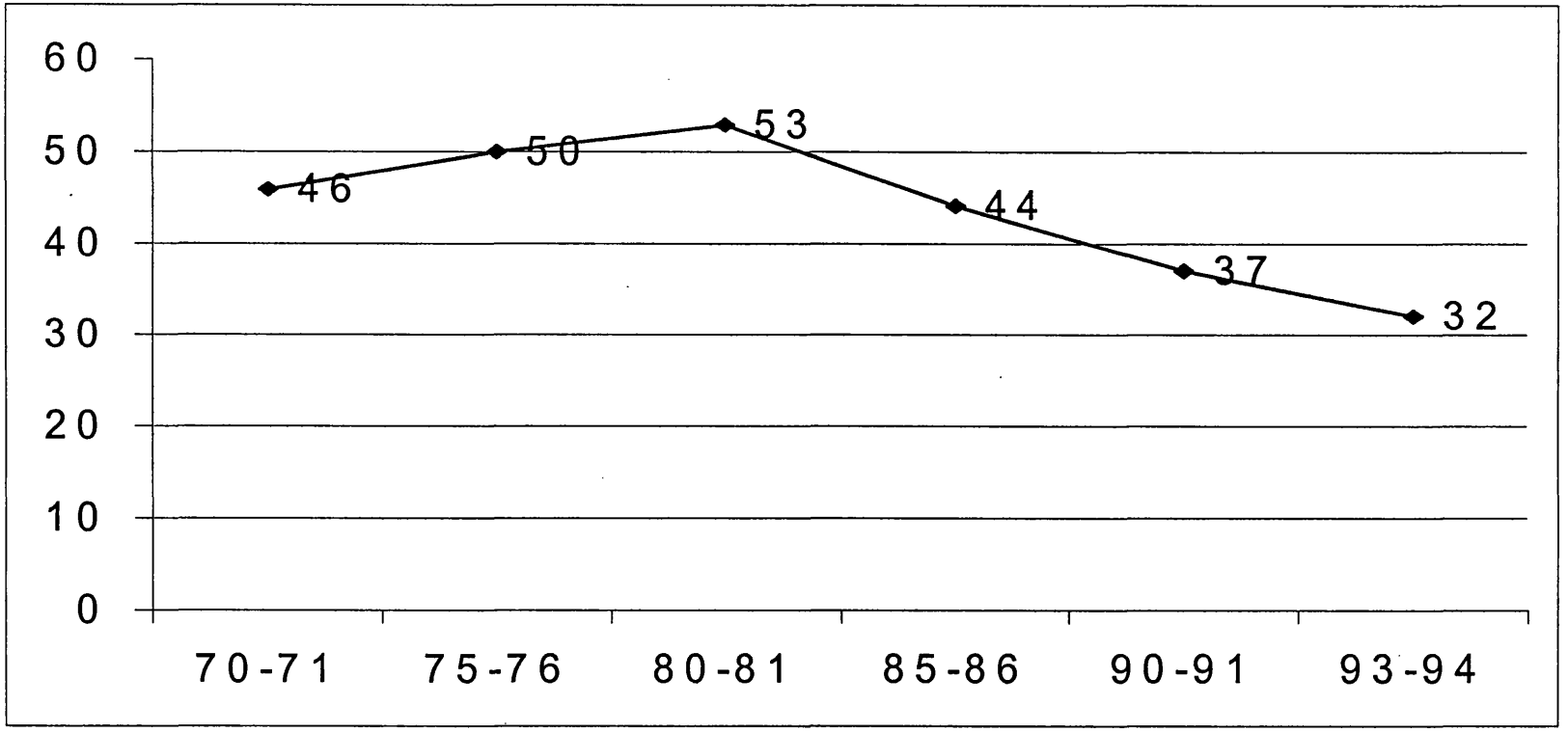


	1986	1997
Degree	7.2	12.5
No Qual	28.2	18.7

Source: **Skills Survey, 1997**

Graph 1.5

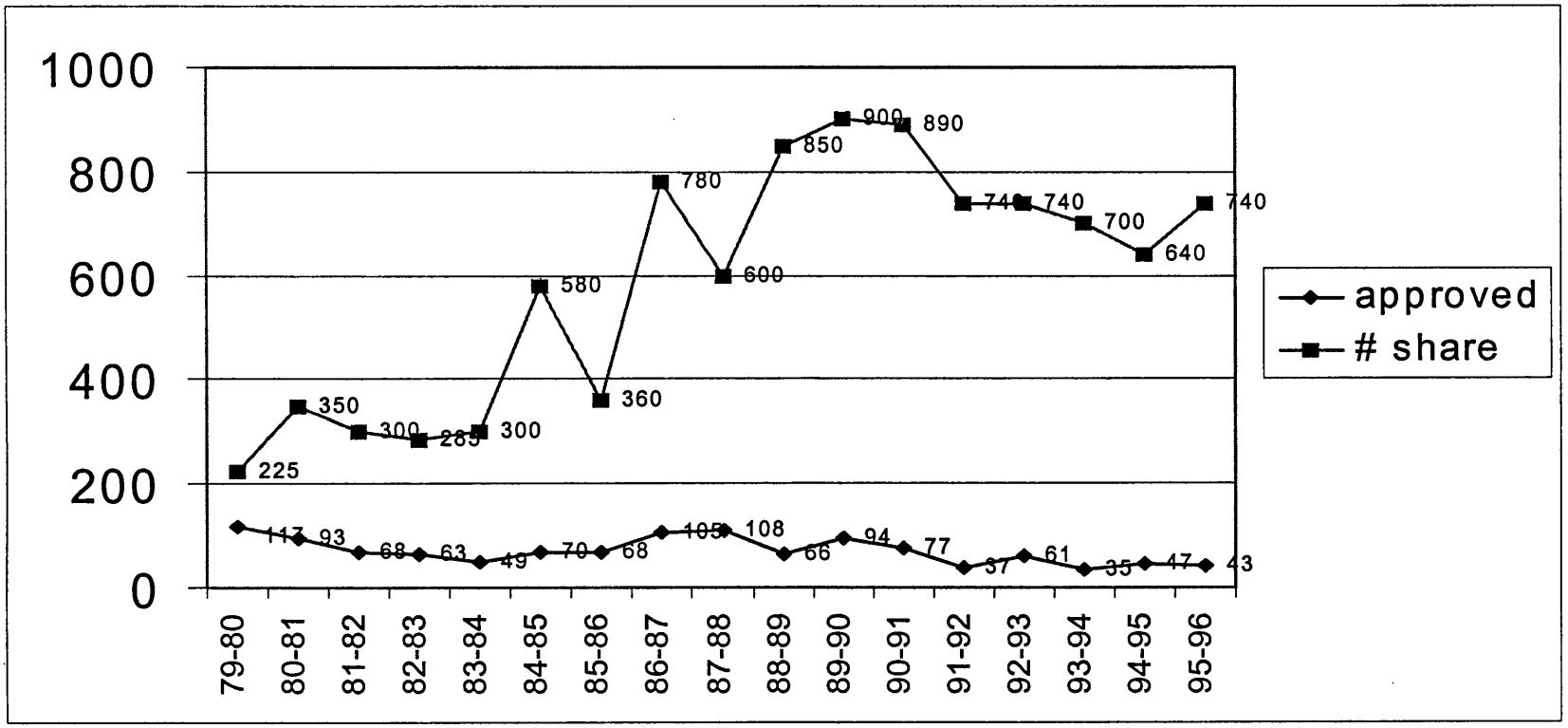
Trade Union Membership as a Percentage of Workforce in the UK



Source: **Social Trends, Office of National Statistics, 1997**

Graph 1.6

Number of Approved Profit-Sharing Schemes and Number of Participants Receiving Shares by Year

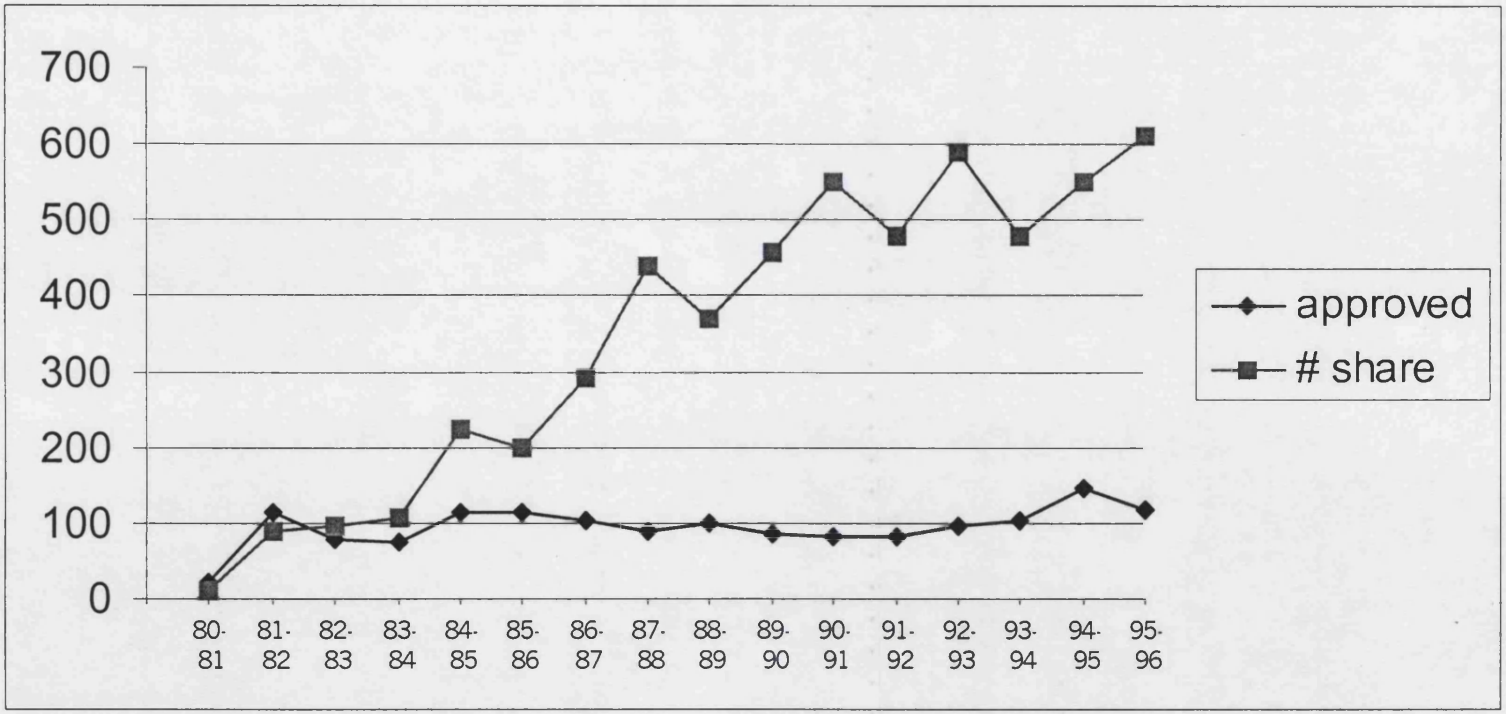


Source: **Inland Revenue Statistics for 1997**

Actual Number for Approved # Shares in (0000)

Graph 1.7

Number of Savings-Related Share Option Schemes and Number of Employees to Whom Options were Granted

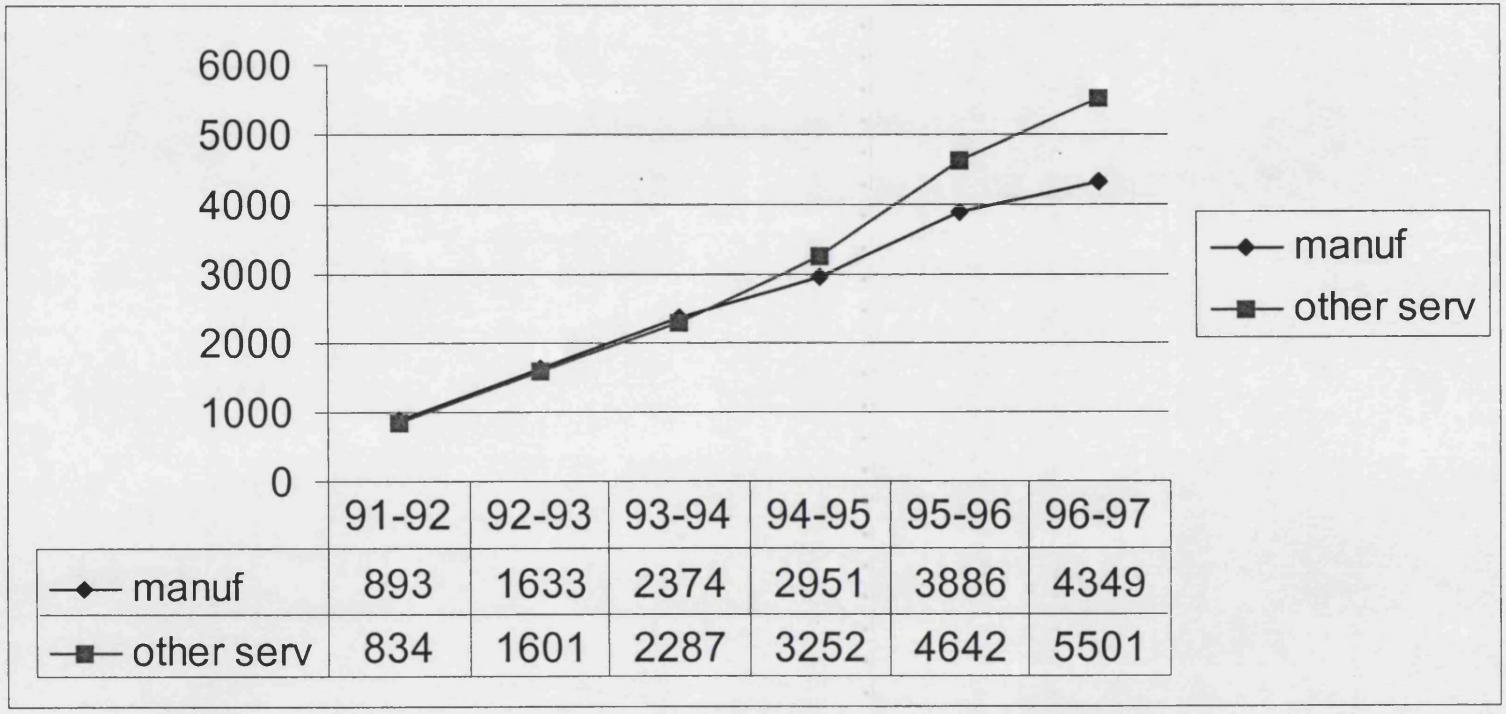


Source: **Inland Revenue Statistics for 1997**

Actual Number for Approved # Shares in (0000)

Graph 1.8

Total Number of Profit-Related Pay Live Schemes by Industry

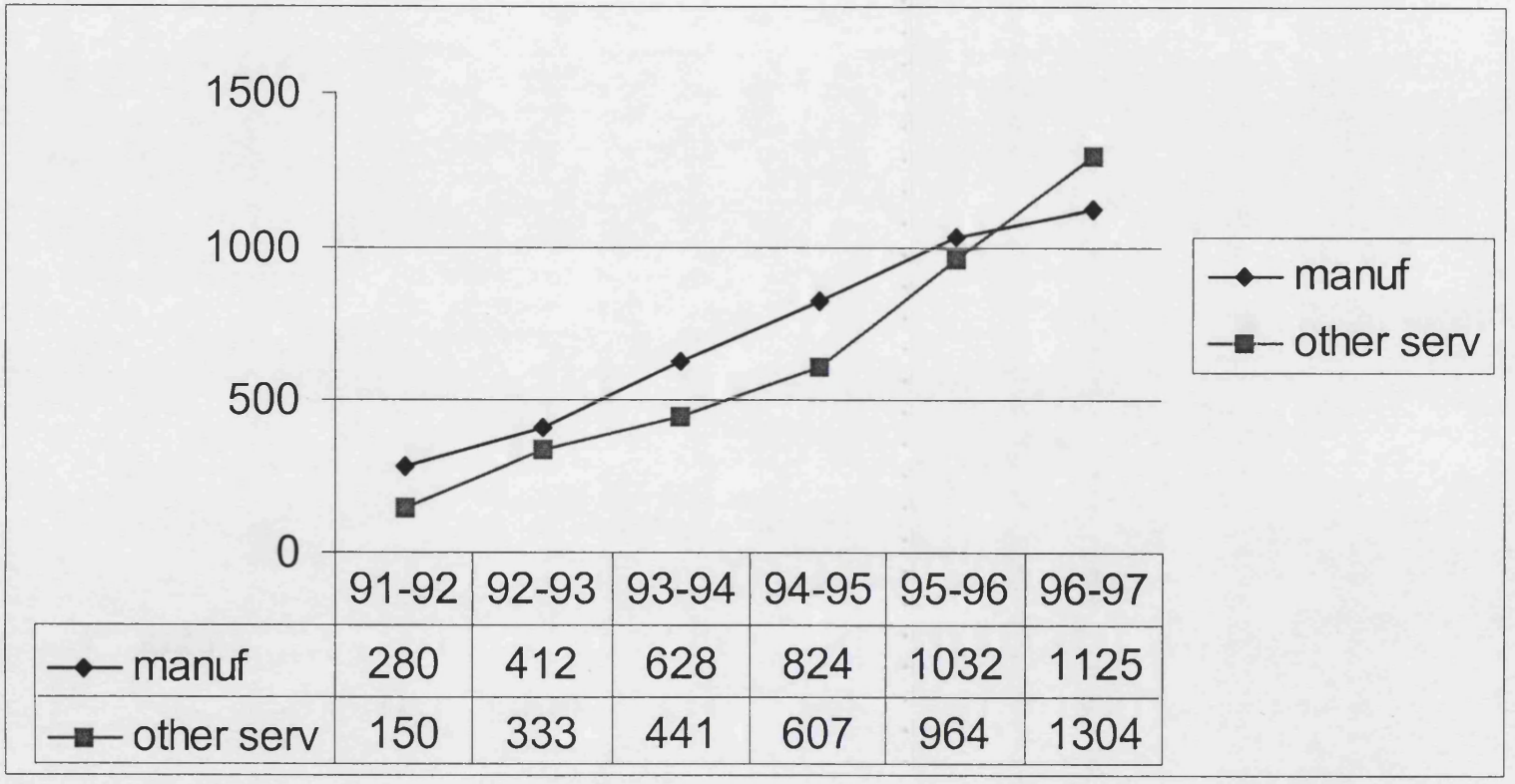


	91-92	92-93	93-94	94-95	95-96	96-97
manuf	893	1633	2374	2951	3886	4349
other serv	834	1601	2287	3252	4642	5501

Source: **Inland Revenue Statistics for 1997** **Actual Numbers**

Graph 1.9

Total Employees in Profit-Related Pay by Industry

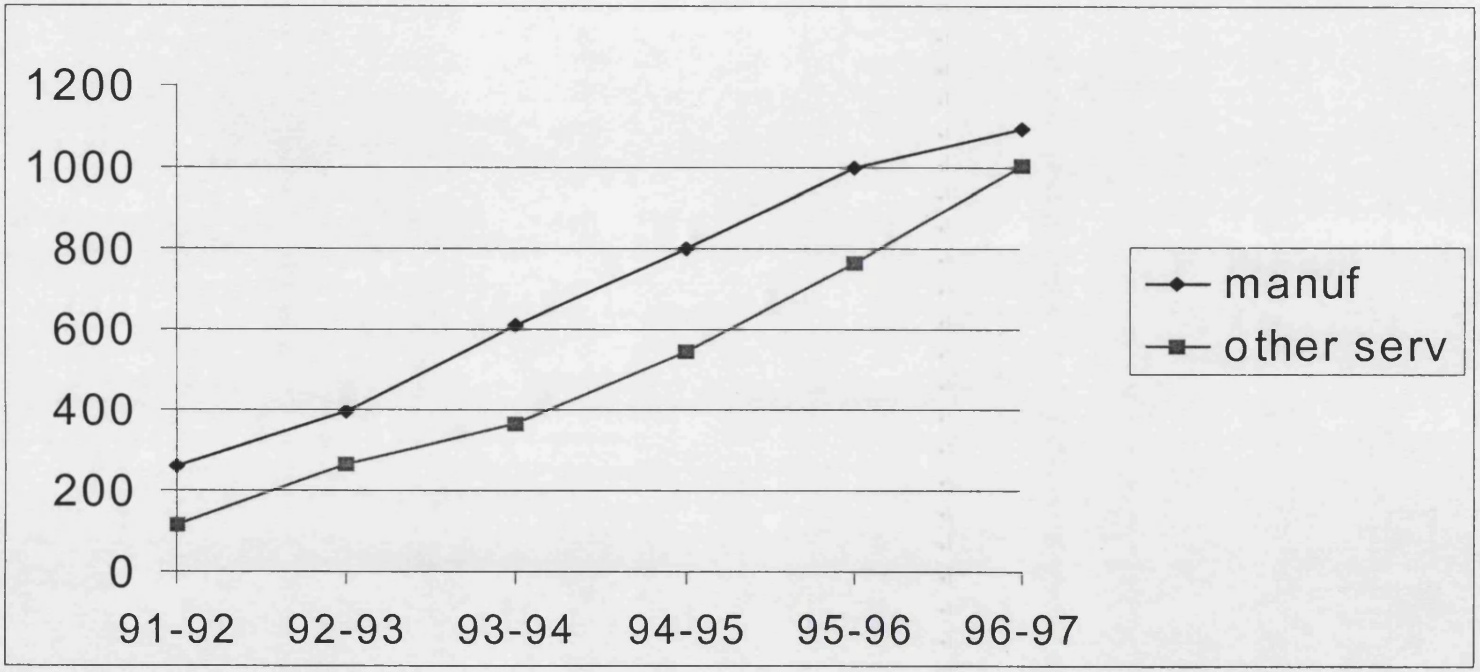


	91-92	92-93	93-94	94-95	95-96	96-97
manuf	280	412	628	824	1032	1125
other serv	150	333	441	607	964	1304

Source: **Inland Revenue Statistics 1997** **Number in (0000)**

Graph 1.10

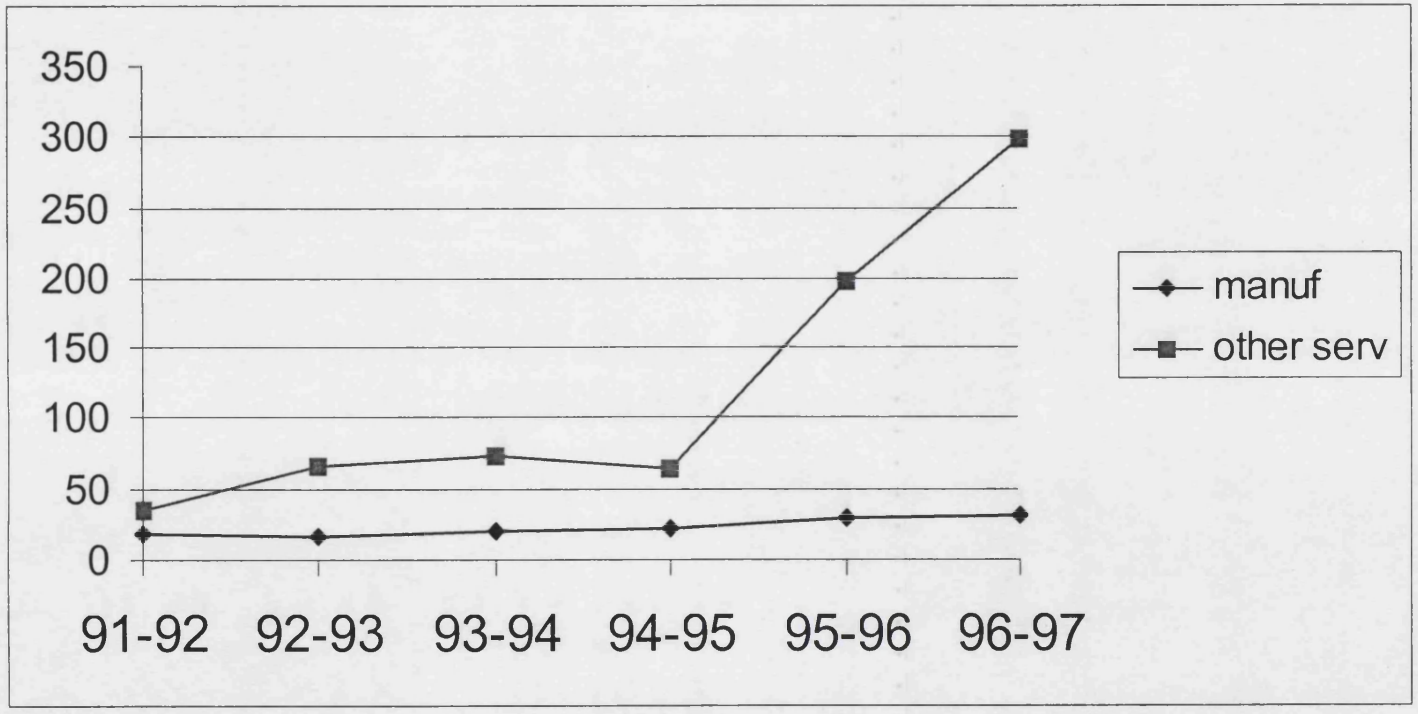
Number of Full-time Employees in Profit-Related Pay Plans by Industry



Source: **Inland Revenue Statistics 1997** **Numbers in (0000)**

Graph 1.11

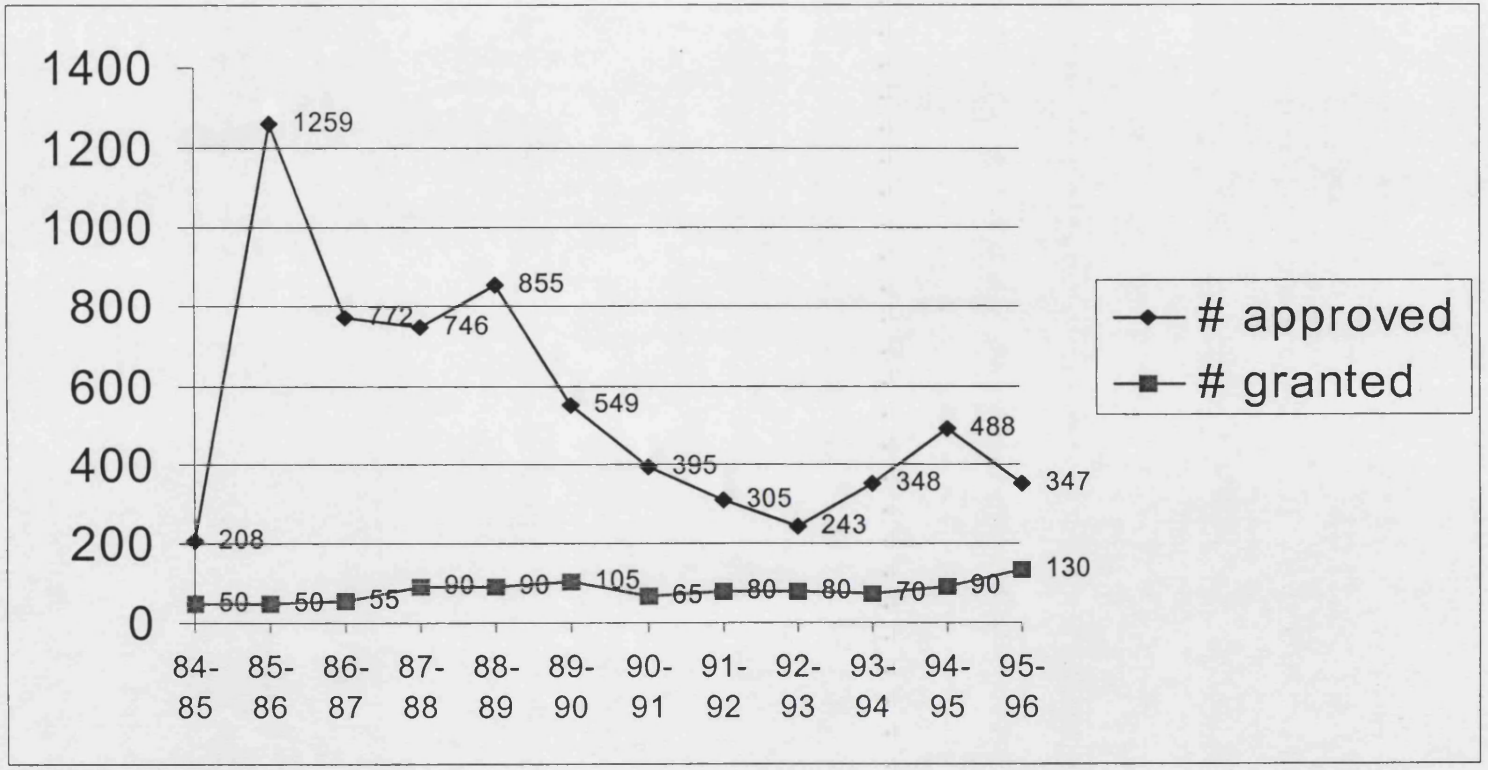
Number of Part-time Employees in Profit-Related Pay Schemes by Industry



Source: **Inland Revenue Statistics 1997** **Number in (0000)**

Graph 1.12

Discretionary Share Options Schemes Approved by Year and Number of Employees Granted Options



Source: **Inland Revenue Statistics 1997** **Number in (0000)**

Chapter 2

Theoretical and Empirical Overview

2.1 Introduction

Chapter 2 sets out to provide an overview of the theoretical issues and the previous empirical research which have a bearing on the questions asked in the introductory Chapter 1. That is, what are the independent and interactive effects of employee involvement and group incentives? While it is difficult to find an unambiguous prediction from theory, and this is the case in my assessment, an overview of the theoretical literature illustrates part of the dynamics present and what we might expect to see. The theoretical overview is taken largely from economic theory, although some psychological theory is discussed. Evaluated in this chapter are both potentially positive and potentially negative performance effects associated with group-based pay systems, employee involvement programmes, and the two used in combination.

Chapter 4, 5 and 6 will contain a theoretical summary, although the theoretical concepts will not be covered in detail in these chapters. Chapters 4, 5 and 6 will also contain some theoretical issues not covered in here but which are related to the specific empirical question addressed in the respective chapter. While I could not locate any empirical studies which specifically address the issue of employee involvement and incentive systems in team production settings, there are studies which examine the performance effects of these practices in a variety of settings. The empirical studies evaluated will include empirical research into the performance effects of employee involvement, group incentives and the combination of the two practices. Similar to the theoretical review, specific chapters will include additional empirical literature associated

with issues covered in the particular chapter.

2.2 Theoretical Overview

2.2.1 Agency Theory

One fundamental theory associated with questions of efficiency in organizations is the *principal-agent theory*. In part, principal-agent theory addresses the incentive effects of ownership (Jensen and Meckling, 1976). Principal-agent theory states that in order to develop an asset, owners need to delegate some of their decision-making rights and claims to part of the residual profits to agents (or managers). Principal-agent theory recognizes that the interests of owners and non-owners are not necessarily the same. The principal needs to incur costs in order to align the interests of the agent with that of the principal. The costs associated with developing these incentive schemes are agency costs. These costs include developing incentive programmes which create an incentive for agents to use their knowledge to benefit the owner's interests.

Agency theory was developed from information economics in order to explain the relationship between the owner of capital, the principal, and those whom they delegate work to, i.e. the agents (Fama and Jensen, 1983; Jensen and Meckling, 1976). It was then extended to organisational control literature (Ouchi and Maguire, 1975) which has developed into a focus on incentive contracts or performance-based pay, risk and the issue of effectively monitoring (Eisenhardt 1985, 1989).

According to Eisenhardt (1988), agency theory presents a theoretical framework for thinking about which compensation plan to use in different organisational settings. It allows a trade-off between determining when to pay based on observable behaviours, such as paying for time spent on the job, and, when it is more difficult to observe behaviour, to pay based on outcomes. The theory emphasizes the need to measure performance and the need for pay choice to be partially determined by the ease of measuring performance. Agency theory takes into consideration difficulty in observing behaviours and also the risk-reward relationship (Eisenhardt, 1988). For example, in the instance where the principal is able to observe perfectly the work that the agent has carried out monitoring costs would be zero, making payment based on output rather than behaviour the most efficient payment system. Paying basis output based on some measure of performance rather than identifiable behaviour, such as time spent on the job, means a number of other factors need to be taken into consideration when determining the most efficient payment contract. Factors which need to be taken into consideration when determining the most efficient contract include: the possibility of self-interested misbehaviour or moral hazard; the difficulty and cost of monitoring; the effects on effort associated with paying basis performance and the risk tolerance of the agent.

2.2.2 Incentive Contracts - Individual verses Team Performance

As previously discussed, principal-agent theory states that because there may exist differing interests between principals and their agents, the principal needs to develop and bear the costs of incentive contracts in order to align the efforts of the agents with the interests of the principal. There are numerous different contracts which employers can choose from and some have more efficient outcomes than others. In order to provide an efficient response to the principal-agent

problem, firms attempt to develop incentive systems which better align the interest of the agent with those of the principal. Work by Fernie and Metcalf (1996) and work by Ehrenberg and Bognanno (1990) indicates that paying for performance does produce greater individual performance outcomes. Ehrenberg and Bognanno use data from the 1984 European Professional Golf Association (PGA) to examine the tournament effects of compensation practices. They determine that where compensation is placed at risk there is a higher level of performance. Their work also supports the contention that a tournament structure of remuneration is conducive to greater levels of performance. A similar study conducted in the United Kingdom, looking at the horse racing industry, was carried out by Fernie and Metcalf (1996). In Fernie and Metcalf's work they look at the incentive effects associated with having compensation at risk versus fixed pay systems. They find that race jockeys who are paid relative to performance perform better than those riders paid a retainer or a fixed payment. These two studies support the theoretical position that more efficient individual level outcomes are associated with incentive contracts based on performance. While the work by Fernie and Metcalf and Bognanno and Ehrenberg clearly shows there is better performance where pay for performance is found, horse racing and golf are individual pursuits. What is the most efficient incentive contract in team production settings?

There is some support that in team production settings where output is achieved basis an 'interdependent production process', group or team-based compensation systems will provide optimal performance outcomes (MacLeod, 1988; Nalbantian, 1988). Support for this comes from Schmitt (1981) who found that group incentives were much more effective than individual-based rewards in settings where there was a high degree of interdependence of tasks. They found that when tasks could be measured individually, individual rewards worked best, but when

individual contributions to group output were difficult to measure, group incentive worked best. Another factor which may favour the use of group, rather than individual, incentives is the trend discussed in the introduction that private information is increasing which may result in very high monitoring costs. In situations where monitoring costs are very high, it may be to efficient to share profits which may act as a substitute for formal monitors (Milgrom and Roberts, 1992). For example, a partnership structure is often used when it is difficult or expensive to monitor others' work. Law firms and management consultancies are normally established as partnerships because in these settings the employees have a high degree of human capital and it would be very expensive for an outsider to effectively monitor their work. Professionals which have the same sort of educational background and experience are in a better position to monitor the work of each other. The fact that the partnership normally shares profits acts as an additional incentive for the other partners to monitor the work of each other to verify that no one is shirking their duties.

2.2.3 Contract Incompleteness and Implicit Contracts

Incentive contracts are in part established in order to align the incentives of the principal and the agent. It is, however, impossible to develop a contract which is entirely complete (Milgrom and Roberts, 1992). This would entail determining all the possible eventualities of any particular relationship and making explicit exactly what could be done as various contingent situations arose. For example, a complete contract would specify what would happen if an individual shirked their duties. The contract would specify that their pay would be reduced by a determined level. Alternatively, if the employee were to come up with an idea which saved the company money, this would also be dealt with in the contract. Attempts to formalize

conditions of the employment relationship, and to specify within the contract actions to be taken in particular circumstances, often leads to inefficiencies.[1] For example, narrowly defined job descriptions which attempt to identify all activities a person can perform may impose restrictions on a person's activities which may result in lower output.

The fact that complete contracts do not exist is due to some of the following limitations. Because of *bounded rationality* it is impossible to account for all possible contingencies. In complicated relationships many contingencies arise which are not planned for so the parties must find ways to adapt. This opens the door for opportunistic behaviour, *moral hazard,* including not following the original precepts of the contract. It may also be possible that one of the two parties has private information which stands in the way of a value maximizing solution. This also opens the door for self-interested misbehaviour (Milgrom and Roberts, 1992).

One way in which this incomplete contracting has been addressed is through the notion of implicit contracts (MacLeod, 1988). These are implicit rather than explicit contracts which may consist of a firm attempting to achieve a high level of loyalty, team spirit and high morale. According to Alchian and Demsetz (1992) implicit contracts may help to better align the interests of the principal and the agent. It may be that combinations of explicit and implicit contracts produce more efficient outcomes than the use of 'only' explicit incentives.

In psychology, it is largely within *psychological contracts* that the notions of loyalty, co-

[1] One form of explicit contracting which has been in decline is formally negotiated union contracts (Lewin, 1994). However, according to Lewin (1994) other forms of explicit contracts, which he refers to as 'employment contracts' are increasing. These are formal agreements which spell-out part of the conditions of employment such as hours worked, holiday entitlement, pay, confidentiality, property rights etc.

operative corporate culture, high employee morale and commitment are dealt with. According to Schein (1980), the notion of a psychological contract between employees and employer consists of the expectations, beliefs and attitudes which each party holds for the other.[2] It is asserted that a strong organisational culture is a prerequisite for the success of teams and other forms of employee participation programmes (Lawler, 1986; Levine and Tyson, 1990; Lewin, 1994; Siehl and Martin, 1990).

Kandal and Lazear (1992) evaluate the necessity of this added 'organisational culture' component using the concepts of shame and guilt. Essentially they suggest that there may be occasions when it is efficient for organisations to develop these two responses in their workforce. They characterise a 'shame-based' culture as being one in which work is monitored and if workers are shirking their duties pressure is placed on them to 'pull their weight'. Alternatively, in a 'guilt-based' corporate culture workers feel internal discomfort when they shirk their duties because they are letting their peers down. Consequently, Kandal and Lazear suggest that it may be advantageous for firms to develop a 'shame-based' culture, or mutual monitoring, where output and effort is easy to monitor and a 'guilt-based' culture, or loyalty, where effort and output is harder to observe. They go on to say a necessary element associated with these two types of culture is some form of profit-sharing. This sharing in returns provides the group-based gains which would provide individuals with the incentive to not shirk their duties, which would have the effect of negatively impacting their peers.

[2] An example would be 'realistic job previews', Wanous (1992) which emphasizes a realistic review of both positives and negatives associated with conveying information about the job. Wanous found that where expectations were more closely aligned with the reality of a situation, there was a greater likelihood of positive individual and firm performance.

2.2.4 Sharing Residual Control and Residual Return Rights as an Efficient Combination of Explicit and Implicit Contracting

One possible combination of an explicit contract combined with an implicit contract which may promote greater efficiency in a team where monitoring costs could be high is the combination of group incentives with a high degree of employee involvement.[3] According to Milgrom and Roberts (1992) it is these two fundamental rights of ownership, residual return and residual control, combined with statutory property rights that provide the framework necessary to create and develop an asset. Residual control rights being the ownership rights to decide what is done with an asset, after honouring any other contractual obligations and residual return rights being the rights to residual profits once all obligations have been met. It is recognized that there are occasions, for efficiency reasons, when it is best to transfer these rights of ownership to the best person to be in charge (Milgrom and Roberts, 1992). It is also speculated that these two rights of ownership will work best when transferred in combination rather than independently (Ben-Ner and Jones, 1995).

2.3 Incentive Effects of Residual Control: Theoretical Review

2.3.1 Private Information

At the heart of much of the theorized productivity effects of employee involvement is the

[3] The idea of efficient internal organization as a combination of explicit and implicit contracts is developed by Rozen (1991), in the notion of *implicit contracts plus*. This notion suggests the interests of both employee and employer are best served in an organisational culture comprised of trust and co-operation. His ideal organisational form is the labour-managed firm.

recognition that employees have access to information which may improve the production process or improve customer service (Levine and Tyson, 1990; Cooke, 1993; Fernie and Metcalf, 1995). While the principal normally has access to information which agents do not have access to, such as financial and strategic information, agents have information regarding the production process, customer preferences, information which comes with their own human capital, such as skill and knowledge, or the information associated with information sources due to information technology. As shown in the introduction, increased levels of human capital, information technology and an increase in the service sector have increased the information to which employees have access. An issue faced by firms is how to gain access to this information.

Part of the reason firms put employee involvement programmes in place may be to gain access to this private information (Levine and Tyson, 1990). Initiatives such as quality circles, autonomous work groups and a wide array of possible employee involvement programmes are all at least partially attempts to access information which employees have. Whether employees are in close proximity to customers or are close to the production process, employers want to access this information. Two forms of employee involvement programmes include the decentralization of decision-making and two-way information-sharing sessions.

The increase in the specialized knowledge of employees puts pressure on employers to push decisions, which they had previously taken, to lower levels in the organization and/or to put in place communication programmes which access this information. A question which arises is, when is it efficient to push decisions down to lower levels in the organization and when is it rather more efficient to place communication mechanisms in place which allow access to potentially productivity-enhancing information? According to Lazear (1995), the decision

regarding which form of employee involvement programme is used takes into consideration three factors: analytical ability of those close to the information, value of this information and the cost of communicating this information. If the value of the information is high but the cost of communicating this information is also high this may argue for a decentralization of tasks to employees. If information costs are low and the information is valuable, this may justify the development and use of information-sharing sessions.

2.3.2 Psychological Mechanisms Associated with the Incentive Effects of Employee Involvement

The psychological mechanisms which support increased performance when employee participation is present include *cognitive theory* and *affective theory*. Cognitive theory recognizes employees have private information and holds that employees have more knowledge about the work process than do supervisors or management. Consequently, if workers participate in decisions about the work process, greater worker efficiencies will result because those with the most knowledge are in a position to make changes which increase efficiency (Anthony, 1978; Frost, Wakely, and Ruh, 1974). Additionally, if employees make suggestions for changes in the workplace, they will be more likely to put the changes into practice (Maier, 1963; Melcher, 1976). Cognitive theory holds that increased performance is associated with specific workplace changes, due to suggestions or actions of employees, which increase efficiency. For example, due to a shopfloor worker's proximity to the production line she/he may have information or knowledge of the line operations which could increase efficiency. The identification, implementation and increased output due to suggestions from a person who has private information on the job process would reflect the potential benefits of cognitive theory.

A problem with cognitive theory is it assumes that employees have the necessary incentive to act on or communicate these productivity-enhancing ideas to someone who can act on them. It is largely because of this assumption, that employees will automatically share what they know, that cognitive theory is not viewed as the primary mechanism responsible for productivity gains associated with participation (Miller and Monge, 1986). While this theory does contain a fundamental performance-enhancing property, that those performing the job function are in the best position to make changes, in order for employees to share their knowledge, they may need an incentive.

Affective theory supports the view that in a participatory environment individuals will increase their effort simply because the act of participation itself is enough to motivate people to put-forth more effort. Affective theory holds that participatory programmes work because involvement in the work process appeals to higher order needs such as self-expression, respect, independence and equality, resulting in an increase in morale and satisfaction (Ritchie and Miles, 1970). By fulfilling these needs, participation will in turn lead to greater levels of satisfaction which leads to more effort and greater performance (French, Kay and As, 1960). In a meta-analytical review of much of the research associated with participation and satisfaction Miller and Monge (1986) support the view that participation has a positive effect on both satisfaction and performance. An example of the application of affective theory in the workplace could be the use of information-sharing sessions or quality circles without the inclusion of incentives. Affective theory would suggest that the act of requesting input from employees would appeal to their higher order needs and result in greater involvement.

One issue concerning affective theory is that it focuses on the act of participation itself as the crucial element. According to this theory it is not the information itself but rather the process which leads to increases in performance. This is a very different conclusion from cognitive theory of participation which states that it is the suggestions which result in better performance. Consequently, the job content or the participatory activities themselves do not necessarily need to be performance-enhancing. It is thus possible within affective theory that employees are reducing overall organisational performance rather then enhancing it. It is conceivable that you have highly motivated individuals who are working to minimize their own efforts or that efforts are not directed in a way which is of benefit to the organisation (Ben-Ner and Jones, 1995). While addressing individual higher order needs may increase an individual's effort, the effort may not be in a direction which maximizes the firm's utility but rather maximizes the individual's. If a person has control over their work practices, the incentive would be to design the job in a way which is most satisfying for the employee. Consequently, organisational performance will only be a result of how closely the firm's maximum efficiency is aligned with what acts as an incentive for the individual. However, this also assumes the employee has no rights to any returns or additional incentives. Given that control has been taken from shifted from management to employees, monitoring by management is reduced or eliminated.

2.3.3 Organisational Efficiency Associated with Employee Involvement

Some view the principal-agent problem as enough in itself to argue against there being any positive effects associated with participation or sharing the residual rights of decision-making. According to Jensen and Meckling (1979) profits will be reduced because as you increase the number of decision-makers you increase monitoring costs and subsequent inefficiencies. The

same conclusion was also reached by Williamson (1975) who stressed the greater transaction costs when many people are making decisions. Both Jensen and Meckling and Williamson's implied definition of participation is that an increased level of information-sharing will result in a corresponding increase in decision-makers. They further assume that with employee participation, the decision-making process will slow down, resulting in greater transaction costs and thus causing inefficiencies. Inherent in this assumption is that any gain associated with more efficient decisions would be negatively offset by the increased time these decisions took, resulting in an overall negative net impact on performance. Jensen and Meckling and Williamson's assumptions may hold true only in the case of a limited set of participation programmes. In the case where the residual rights of control are transferred to non-owner employees in the form of decentralizing decisions to lower levels in the organization there is, consequently, a reduction in the number of decision makers. From the vantage point of Jensen, Meckling and Williamson, this reduction in decision makers and subsequent reduction in layers may reduce transaction costs and increase efficiency.

Using this same agency theory framework, participatory programmes can result in improved firm performance (Levine and Tyson, 1990). Participatory programmes which give employees greater control will allow them to make efficiency-enhancing job changes, or communicate needed changes to management. In addition, according to Levine and Tyson, by combining a share in the returns with participation in decision-making rights, owners' and employees' interests are aligned and owners are able to take advantage of employees information.

2.3.4 Moral Hazard

One very fundamental problem associated with the efficiency effects of employee involvement is the problem of *moral hazard*, or shirking. The term originated in the insurance industry and refers to the tendency to change behaviour in order to maximize gain from a given claim. An example would be the tendency of individuals to use healthcare facilities much more frequently when there is no cost to themselves.

This problem surfaces in organisations when those with critical information have interests divergent from owners. It may be in a person's self interest to withhold information which may be of considerable value to decision makers. The moral hazard issue is the tendency for individuals to engage in self-interested, opportunistic, 'misbehaviour'.

It is possible to view the moral hazard problem from the principal-agent perspective. The agent is employed to further the interests of the principal. Moral hazard surfaces in situations where the agent and principal have different objectives and it is difficult for the principal to closely monitor the actions of the agent. This is evident because many organisations use various types and forms of incentive contracts. While these payments reduce the residual profits it is also true that this sharing in the residual profits may well represent one of the most efficient contracts. The sharing in the residual profits may actually better align the interests of employees with management, which may result in overall greater efficiency (Milgrom and Roberts, 1992).

While Milgrom and Roberts (1992) believe that it is possible to engage in communication procedures which enhance the efficiency within organisations the key is explicit incentives.

Conflict of interest will always arise in the situation of moral hazard. There are a number of conditions which must exist if the problem is to arise in the first place. First there has to be the possibility of differences in interest between parties. While interests may often be well aligned, there will definitely be conflict for reasons such as scarcity of resources. Second, there needs to be some basis for co-operation between individuals, a reason for people to work together for a common goal. Third, there must be some difficulty in determining if the contract has been kept. This is especially the situation when it is difficult to monitor the activities of employees closely.

2.4 Efficiency Effects of Residual Return Rights: Theoretical Review

2.4.1 Impact of Sharing in Returns on Effort

Principal support for the productivity effects of profit-sharing within economic theory is associated with the effect profit-sharing may have on effort. According to Weitzman and Kruse (1990) in the prototype example a person produces a single output from a single input. The input is ideally thought of as a combination of hours of work and effort. While it is easy to measure hours it is more difficult to measure or observe effort. According to Weitzman and Kruse, effort may consist of working hard and working intelligently including the use of private information. Under a wage system, a worker is paid a fixed rate dependent on the number of hours worked. This results in some level of output. If, however, it is inexpensive and easy to verify if the output level is efficient, a wage system often results in too little output relative to how much is socially optimal.

The solution is to pay the worker for a level of output which is easily observable: this would mean an efficient outcome whereby the worker is paid for what he or she produces and would automatically adjust her/his effort to an optimal level. Consequently, all else being equal, profit-sharing would be more likely to produce greater productivity than a wage system.

The impact of having rights to residual profits on effort is modelled by Lazear (1995) in his book *Personnel Economics*. In his analysis he determines that the optimal incentive contract makes the worker or the employee the residual claimant of all residual profits.

According to Lazear the payment scheme consists of the following:

$$\text{Pay} = a + bq, \qquad (2.1)$$

where q is output and a and b are remuneration parameters. Here output will depend on both effort and some random element, y:

$$q = e + y.$$

We assume that the employee likes income, but does not like work, C(e). Both C' and C" are positive which means the solution has a finite level of effort. At some point the employee will reach exhaustion and the costs of producing another unit will become infinite.

The solution to the employee's labour function is:

$$\max E[a + b(e + y)] - C(e), \qquad (2.2)$$

the first order condition would be:

$$C'(e) = b. \qquad (2.3)$$

Equation (2.4) is the employee's labour supply function which is what the firm takes as given when it maximizes profits by choosing a and b. Given C" > 0 and risk neutral, effort increases in b. Higher wages correspondingly induce greater effort, so labour supply functions are positively sloped.

According to Lazear the profit maximizing firm faces the following issue:

$$\max E(q) - (a + be). \qquad (2.4)$$

This is subject to the employee being willing to take the job in the first place shown in 2.5:

$$a + be > C(e). \qquad (2.5)$$

Equation (2.5) is just saying that the employee needs to earn enough to cover his distaste for work.

$$\max e - C(e), \qquad (2.6)$$

with the first-order condition.

$$\frac{da}{db} = [1-C'(e)] \frac{de}{db} = 0. \qquad (2.7)$$

(de/da= 0, so the second condition is the same.)

Equation 2.7 assumes the firm will choose b in order to bring about maximum efficiency. In order to maximize profits the firm wants the employee to set the maximum cost of effort equal to the marginal social value of effort. This implies that taken together (2.3) and (2.7) b = 1. After b is chosen, optimal effort is chosen by (2.3); (2.5) then dictates the size of a in order to attract employees to the firm. Also, b = 1 implies that the employees should receive the entire residual profit.

2.4.2 Efficiency Wage

The model of *efficiency wage* is largely developed by Shapiro and Stiglitz (1984). Essentially the argument suggests that employees who are paid at an above market rate are more likely to exert a greater level of effort in an attempt to remain in the good favour of their employer and remain employed. Given the wage premium they are paid they do not wish to risk losing their job. This rationale is conveyed in the following equation found in Milgrom and Roberts (1992).

$$G > P(W - W^*) N \qquad (2.8)$$

W (£30,000) equals the wage in the current job and W* (£25,000) represents the wage which the employee would get at the other firms. G represents any gain that the employee may receive from cheating on the job (£1,000) and P is the probability that the employee's cheating will be detected (.5). N, (1 in our example) represents the long-term multiplier of the employment relationship. If the employee is on a short-term contract which requires them to reapply frequently the multiplier is considerably less than if there is a potentially long-term advantageous relationship. It will be profitable to cheat if G is greater than the solution to P(W-W*)N.

Inserting the values in equation 2.9, .5(£30,000 - £25,000)1 = £2,500. £2,500 is greater than £1,000 so in the example cheating is not profitable. In order to provide a disincentive for employees to cheat employers must make G sufficiently low and P sufficiently high so as to discourage cheating.

2.4.3 Sorting and Risk Aversion

Another issue associated with the increased productivity effects of profit-sharing may be the fact that more productive employees sort to firms which offer some degree of compensation at risk. A crucial issue in this line of research is whether profit-sharing or other group incentives actually increase the productivity of individual workers or whether more productive workers sort to firms which have group incentive programmes. This question is important because if there is only a shift of more productive employees from one firm to the other, society as a whole does not benefit. From a 'benefit to society' view it is better that these forms of compensation programmes actually increase employee productivity because then the pie is getting bigger rather than just being redistributed. However, at the level of the individual firm, the sorting issue may

work to their advantage because pay at risk may attract higher ability employees so these firms may attract more productive employees than their 'fixed' rate paying competitors. This, coupled with the potential for a greater effort level, may result in greater productivity than at firms or establishments which do not put remuneration at risk.

While there may be some benefits to the firm or establishment, there may also be a disincentive to employees associated with transferring risk from the employer to the employee. Employees are thought to be risk-averse and this is largely borne out by the way in which employees sort to positions where their exposure to risk is kept to a minimum. Depending on the risk tolerance level of the employee, this transferal of risk may also result in a higher turnover and overall reduced employee motivation.

2.4.4 The Free-Rider Problem and Adding Monitors as a Solution to Free Riding

The *free-rider problem* is often used as a criticism against group-based remuneration schemes such as profit-sharing. The free-rider problem is the tendency for individuals to 'free ride' on the work of others. If an individual is associated with a group-based incentive scheme, such as profit-sharing, where withholding effort will have a negligible impact on the overall results as long as everyone else continues to work hard, then there is an incentive for the individual to shirk their duties. This is sometimes also referred to as the 1/n problem, as n or the number of employees gets larger the results of one's efforts may be less apparent. While there is a tendency to shirk duties in so far as monitoring will allow, it is also true that everyone will be better off if everyone works hard and profits are increased. Consequently, there is a possibility for both a non-co-operative and co-operative solution. The non-co-operative solution is associated with

free-riding on the efforts of others and the co-operative solution is based on everyone putting in their best effort, thus increasing profits to be shared. In an environment where group financial incentives exist, participation may help provide the mechanism needed to develop this co-operative solution. In the case of team-based participation programmes that are coupled with team-based incentive programmes, team member's actions are observable by other team members leading to group peer pressure or monitoring that may help eliminate individual shirking. If any individual's incentive pay is partially or wholly related to the performance of the team, there will be incentive to make certain all team members are doing their share.

Weitzman has done much work into both the productivity and employment effects of profit-sharing (Weitzman 1984, 1995). While much of his work and the work of others supports the premise that profit-sharing increases productivity, he also recognizes that there is an added element which impacts upon the success of profit-sharing.

> "To get the productivity-enhancing effects, something more may be needed ... something akin to developing a corporate culture that emphasises company spirit, promotes group cooperation, encourages social enforcement mechanisms, and so forth" (Weitzman 1995, p. 57).

This is further supported by Lewin (1994) who recognizes that one of the major problems with group-based incentives is the possibility of the free-rider problem. He suggests that one of the primary ways in which this is addressed is through the use of employee involvement programmes.

> "One answer is that the individual may know his or her co-workers well ... or may feel a sense of altruism towards or identification with them. Programs of team-based employee involvement and participation in decision-making are intended to strengthen such mutual identification with them"
> (Levine 1994, p. 403).

Taking both the principal-agent issue and the free-rider problem, we see how participation in decisions and sharing in returns may prompted employees with superior job knowledge to use their knowledge to increase organisational efficiency and may also leads to increased peer monitoring. The combination of these two elements could result in greater organisational performance.

2.4.5 Impact of Unionization on Employee Involvement

In the situation where unions are present there will also be effects which are negatively and positively related to performance. Freeman and Medoff (1984) state unions provide a 'voice' mechanism which promotes dialogue between management and employees and increases efficiency. According to Cooke (1994), where unions are present the positive effects of participation may be amplified due to the existence of this communication channel. However, it may also be the case that the presence of a union has a negative impact on performance where hostile relations result in a lack of management - employee co-operation, (Freeman and Medoff, 1984). In the case of the effect of unionization on financial participation, given that union officials were involved in the negotiated settlement of this incentive scheme, they have a strong incentive to encourage employees to look for performance enhancements (Cooke, 1994). However, on the negative side, union leaders would be expected to discourage employees from reporting on shirking employees and employees disciplining other workers.

2.4.6 The Co-operative Solution as a Response to the Free-Rider Problem

One way in which the free-rider problem is addressed is taken from game theory and indicates

that two parties can be better off if they decide to co-operate. This is best illustrated by the *prisoners' dilemma*:

two prisoners are arrested and charged with a crime. The police do not have enough evidence to convict either of them unless the other confesses. The two prisoners have two choices, they can either confess or not confess. The matrix in table 2.1 portrays the various implications associated with their choices. If both prisoners choose to confess they both will get six months for their crime. If, however, either prisoner 1 or prisoner 2 chooses to fink on the other, the prisoner who finks will get off free and the other will get six months for the crime and three months for obstructing justice. If they both choose not to confess they will be guilty of a minor crime and spend one month in jail.

Clearly the optimal choice for either prisoner is to fink on the other, however, this is true for both parties. This will be the prisoners' first choice and both end up in jail for six months. This is the result predicted in the first iteration of the *nash equilibrium*[4] which would state that the choice either party would take would be the one which is their optimal solution. However, it is clear that if they both keep quiet both parties are better off. As the prisoners are repeatedly arrested for their crime, eventually they will determine that they are better off if they co-operate (Gibbon, 1992). This co-operative solution is important because one of the principal objections to group incentive schemes is the free-rider problem.

[4] An example of this can be found in Levine (1995, Chapter 6) where he shows how bargaining problems can lead to a sub-optimal outcome. This is more formally modelled in an article by Freeman and Lazear (1994).

Table 2.1

The Prisoners' Dilemma

		Prisoner 1	
		Confess	**Not Confess**
Prisoner 2	**Confess**	**-6, -6**	**-9, 0**
	Not Confess	**0, -9**	**-1, -1**

2.5 Combining Residual Control and Return Rights: Theoretical Review

General theoretical support for the use of complimentary practices is found in the work Milgrom and Roberts (1990) Holmstrom and Milgrom (1994) and Milgrom and Roberts (1995). Milgrom and Roberts (1990) discuss the implications of the movement from the traditional assembly line model with its emphasis on quantity to the current model of flexibility with a focus on quality and customization. They argue that it is efficient to evaluate work practices relative to the work technology which is in place. Holmstrom and Milgrom (1994) argue that it is important to evaluate a firm's work practices as a part of a larger 'incentive system'. Additional support is found in Migrom and Roberts (1995) who evaluate features of the Lincoln Electric Company and find support for their notion of complementarity and work 'systems'.

Principal support for a combination of these two rights and the sharing with 'non-owners' comes from Ben-Ner and Jones (1995). Ben-Ner and Jones developed a theoretical framework which combines these two aspects of ownership, control and return, and suggest possible firm-level

performance outcomes associated with various levels of the two rights. Ben-Ner and Jones discuss the impact these rights have on individual employee motivation and on structural organisational outcomes. They argue that return rights work best when used in conjunction with one another but can be detrimental if either of the rights are used in isolation. In the instance where employees are assigned only return rights with no control rights, those who retain the rights to the residual returns have less of an incentive to effectively direct the work of employees given they are in a position where they have to 'share' the returns. If, conversely, employees find themselves in a position where they have control rights with no right to returns, the incentive will be for them to shirk or exert as little effort as possible (Ben-Ner and Jones, 1995). When the two rights are combined, the incentives are aligned so the employee can use their superior job knowledge to carry out the job most efficiently and effectively and is rewarded for doing so.

According to Ben-Ner and Jones, in the instance where residual returns are going to employees fewer of these returns may be going to managers, which may result in management having less incentive to direct and control employees in a way which has a positive impact on the firm. This is based on the traditional neo-classical view of the firm in which capital monitors labour and in turn capital is entitled to all the residual returns (Alchian and Demsetz, 1992). Return rights in themselves may have a positive impact on structural variables which in turn may have a positive impact on co-operation among individuals and various parts of the organisation. The rationale would be that the greater alignment of interests between the principal and their agents could lead to maximizing the performance of the firm. One problem with this is that many incentive programmes are anchored in individual or small team objectives, and consequently there is often little incentive to share information which may be of use to other parts of the organisation.

There are mixed effects of control rights or employee participation on performance when used without return rights. According to Ben-Ner and Jones, the impact which participation has will depend largely on the type of participation instituted. If the form of participation is limited to making suggestions, which management may or may not implement, the impact on performance is unlikely to be significant. However, if employees can give input into major organisational strategic planning and have control over their job task, Ben-Ner and Jones (1995) would argue that this form of participation has scope for improving performance.

Ben-Ner and Jones (1995) suggest that three conditions need to be present in order to see a positive impact on control rights. These are:

i. participation is meaningful enough to enhance employee's autonomy and their ability to choose some aspects of their working conditions.
ii. There are ways to ensure that employees do not make decisions that trade off organisational productivity in favour of their individual welfare via working conditions and reduced effort.
iii. The net benefit of participation to individual employees is positive.

According to Ben-Ner and Jones, in the situation where control and return rights are combined, and shared with employees, the agency issue is largely resolved. Combining the claim to residual profits with control over work processes creates an environment in which employees have the authority to use their superior job knowledge to enhance efficiency, and the incentive to ensure they align their efforts with the best interests of the owners.

Psychological Theory Support for a Combination of the Two Rights

While there is support in cognitive theory for the increase in productivity due to employees sharing their increased job knowledge, workers may be less likely to do this if there is not a clear benefit to them. While there is also support for an increase in productivity in affective theory, this theory states that it is the act of participation which increases productivity and not the content. This means employees could well be engaged in participatory activities which are having negative effects on organisational outcomes. Cognitive theory recognizes that employees may have valuable information, however, the theory assumes that they have the necessary incentive to act on this information, or communicate it to those who have the authority to act.

The issue not addressed in these theories is: where does the incentive to share the employee's superior job knowledge, or for him/her to put in greater effort, come from? This missing link is provided from psychological *expectancy theory.*

One problem with the previous psychological theories discussed is that they do not include the necessary incentive to employees for sharing their superior job knowledge. It is within expectancy theory that a rationale for employees to share in returns is provided. Expectancy theory asks the question, 'what is in it for me?'. Expectancy theory was developed by Vroom (1964) and is referred to as VIE or *instrumentality theory.* The theory is used to describe how people choose from several possible courses of actions. The three components which make up expectancy theory are:

Expectancy:	Does the employee have the necessary skills to perform the task which has been asked of her/him?
Instrumentality:	Would the employee be rewarded for performing the task?
Valence:	Would the reward be something which the employee valued?

Expectancy theory gives a psychological framework for ensuring that employees are presented with incentives to perform their jobs in a way which aligns their interests with those of the firm. Therefore, expectancy theory provides the recognition that incentives are necessary in order to motivate desired behaviours.

Incentive Contracts Address the Moral Hazard Problem

An issue with a high degree of employee involvement, without incentives, is the potential for moral hazard. While psychologists argue that involvement in itself provides enough incentive to promote involvement, without incentives, a high degree of worker involvement may result in shirking. This may occur when the agent has a high degree of control over their job, however without rights to returns. In this situation the agent may choose to reduce effort, in so far as monitoring and their 'span of control' will allow, and shirk. One way to resolve this problem is by including incentives which help to align the interests of the agent with that of the principal.

2.6 Empirical Review of the Performance Effects of Employee Involvement and Group Incentives

There are no studies I could locate which examine the impact of employee involvement programmes and group incentives in team production settings, however, there are a number of

studies which evaluate the impact in unspecified settings. The following is a review of a number of those studies. The individual empirical chapters will include additional empirical work related to the questions addressed in the respective chapter.

2.6.1 Residual Control: Empirical Review

Table 2.2 presents a summary of select articles on the economic impact of employee participation programmes. Using meta-analysis Doucouliagos (1995) carried out a survey on the effects financial and decision-making participation have on company performance. He finds that there is a negative association with co-determination laws, but positive associations with profit-sharing, worker ownership and worker participation in decision-making. He also finds that all relationships are stronger in firms owned and controlled by workers and in firms adopting more than one employee involvement scheme.

2.6.2 Residual Return: Empirical Review

While a broad econometric analysis of the productivity effects of profit-sharing and case study evidence focussed on profit-sharing is presented in Table 2.3, there is very little research on the profitability effects of profit-sharing in the UK. Some of the most recent work is conducted by Bhargava (1994). Using a panel dataset he examines the impact of the introduction of profit-sharing on the financial performance of British manufacturing firms. Controlling both for unobserved firm-specific fixed effects and controlling for potential endogeneity, he finds there to be both a short-run association with higher profitability and evidence that there is higher profitability in firms which use profit-sharing. The same was found by both Estrin and Wilson

(1987) and Cable and Wilson (1989) who discovered that the average return on capital is higher in profit-sharing than in non-profit-sharing firms. Richardson and Nejad (1986) examine UK firms and use share price as a proxy for profitability and find there to be evidence of improved financial performance in firms which use profit-sharing. However, Blanchflower and Oswald (1988) do not find there to be any evidence of an impact of profit-related pay on UK firms.

2.6.3 Residual Control and Return Combined: Empirical Review

There are five studies which I was able to identify, summarized in Table 2.4, which explore the relationship between combining control and return rights and the impact they have on company performance. Conte and Svejnar (1988) found that employee participation (EP) and profit-sharing each had significant effects. Mitchell et al. (1990) found that employee participation and group-based incentives were significant independently but not combined. Kruse (1993) found positive effects of profit-sharing but no combined effects or independent effects of EP. Cooke (1994) found that the combination of EP and group-based compensation schemes had fairly substantial effects on firm performance. These effects were also considerably amplified in unionized firms. Fernie and Metcalf (1995) found that workplaces with employee involvement characteristics, such as employee-management communication channels and incentive schemes, have higher productivity than other types of workplaces.

The two studies most similar to the work in this thesis are those of Fernie and Metcalf (1995) and Cooke (1994). While Fernie and Metcalf evaluate links between employee involvement, contingent pay and different forms of collective representation I focus on only employee involvement and contingent pay. They examine the impact these practices have on six outcomes,

including productivity levels, productivity growth, change in employment, industrial relations climate, quit rate and absenteeism. They found that employee involvement and contingent pay were more likely to be associated with positive economic outcomes. In addition, the best performance outcomes were found when these two practices were used in combination. The same finding was discovered by Cooke (1994) who evaluated the impact of employee involvement and group incentives, independently and interactively, on productivity and financial performance. He found that firms which used employee involvement and group incentives had greater performance outcomes and that these results were more pronounced when the two practices were used in combination. Cooke also found these results were stronger in unionized firms.

Arthur (1992) evaluates the how industrial relations practices vary in relation to different business strategies. He evaluates business strategy in U.S. steel minimills of either high volume lowest possible cost or high customization and more flexible manufacturing processes. The industrial relation systems evaluated consist of either an emphasis on cost reduction or employee commitment. He finds there to be a strong relationship between an industrial relations system which promotes employee commitment and a highly flexible manufacturing process. MacDuffie (1995) finds that 'bundles' of HR practices which are internally consistent with the business strategy produce better performance than 'non-bundled' practices. For instance, plants which use flexible production techniques perform better if they also use 'high-commitment' work practices consisting of teams, contingent compensation and extensive training. This 'systems' approach is further supported by the work of Huselid (1995), Becker and Huselid (1998) and by the work of Ichniowski, Shaw and Prennushi (1997) and Ichniowski and Shaw (1999).

2.7 Chapter Summary

In Chapter 2 we see conflicting views from the theory and from the empirical evidence regarding employee involvement and group incentives. Starting from principal-agent theory we see that the goals of owners and agents are not necessarily the same. The agent has access to information which will be advantageous to the principal. In order to better align the interests of the agent with those of the principal the principal incurs costs. A portion of these costs are associated with incentive contracts which help to align the interests of the two parties. Incentive contracts may consist of both explicit and implicit contracts; explicit contracts being the formal compensation structure and implicit contracts being corporate culture, fostering team spirit or loyalty.

In settings where there is private information, a high degree of employee involvement or decentralized decision-making may be effective in gaining access to this private information. Also, in settings where there is an integrated production process, group-based incentives may work better than individual or team-based compensation systems.

A problem with a high degree of employee involvement is the possibility of moral hazard or self-interested mis-behaviour. To reduce the opportunity for moral hazard the inclusion of incentives is advisable in order to better align the interest of the principal and the agent and reduce the chance of shirking. There is, however, a problem with group incentives which is the issue of the free-rider or 1/n problem. One way in which to reduce the free-rider problem is to add monitors and foster a 'co-operative' culture which may encourage mutual monitoring, reducing the need for formal supervision.

In summary, there is some support from theory that in a team production setting, where there is a high degree of 'interdependence' among tasks and the employees have private information, an efficient labour contract may consist of a combination or both explicit and implicit incentives, specifically group incentives and employee involvement. To some degree this is borne out in the empirical literature where there is some evidence that when group incentives are combined with employee involvement there is a greater performance outcome than when one or the other is used in isolation. Group incentives or profit-sharing has been shown to have a small but positive impact on performance, but the evidence on employee involvement is largely mixed, often depending on the type of employee involvement used.

Table 2.2

Summary of Research on Employee Participation and Company Performance

Research	Data	Measure	Summary of Results
Berman and Berman (1989)	7 Co-ops 19 Traditional Firms (1958 - 1977)	Physical Output	Significant negative association.
Cutcher-Gershenfield (1991)	25 Work Areas (1984 - 1987)	Scrap Rates Value Added	Positive association with higher levels of participation.
Defourney, Estrin Jones (1985)	550 French Co-ops (1978 & 1979)	Value Added	Employee participation has a positive association with the dependent variable.
Doucouliagos (1995)	Meta-analysis of 43 studies	Various Productivity Measures	Positive association with employee decision-making, worker ownership, profit-sharing, but negative association with co-determination.
Fitzroy and Kraft (1992)	62 West German Firms	Value Added	Significant negative association with productivity.
Levine and Tyson (1990)	Review of 47 studies	Productivity Measures	Mixed results of impact of employee participation on outcomes. Participation more likely to have positive impact when employees are given real responsibility.
Rosenberg and Rosenstein (1980)	68 Five week periods (1969 - 1975)	Plant Output Measures	Very strong association between level of involvement and productivity.

Table 2.3

Summary of Research of Impact of Profit-sharing on Performance

Research	Data	Measure	Summary of Results
Estrin, Jones and Svejnar (1987)	550 French Co-ops (1978 & 1979) 150 Italian Co-ops (1976 - 1980) 50 British Co-ops (1948- 68), 5 year Intervals	Value Added	Robust association between profit-sharing and productivity.
Fitzroy and Kraft (1987)	61 W. German firms in 1977; 62 W. German firms in 1979	Total Factor Productivity	Very robust association between productivity and extent of PS.
Jones (1982)	46 to 30 British Co-operatives (1948 - 1968)	Value Added	Positive association.
Jones (1987)	50 British Co-operatives in Retail Sector	Gross Margin	Positive association.
Kraft (1991)	79 German firms (1977 and 1978)	Total Factor Productivity	PS a positive impact on productivity.
Kruse (1988)	2,976 U.S. firms (1971 - 1985)	Sales per EE	PS associated with between 2.8 per cent - 4.2 per cent increase in productivity.
Kruse (1993)	500 companies with public stock	Value Added	PS adoption is associated with 3.5 per cent to 5 per cent increase in productivity.
Wadhwani and Wall (1990)	101 U.K. Firms (1972 - 1982)	Labour Productivity	Positive impact but not statistically significant

Table 2.4

Summary of Research Associated with Combined Practices

Research	Data	Measure	Summary of Results
Black and Lynch (1997)	627 US Establishments (1987 - 1993)	Sales per EE	Establishments which use participation in decision-making and use PS are more productive.
Cable and Fitzroy (1980)	43 German Firms (1974 - 1976)	Value Added	Whole sample PS effect positive but not statistically significant. Split sample for *high, low* participatory firm in decision-making resulted in positive sig. result for 'high' firms.
Cooke (1994)	841 US Firms (1989)	Value Added	Employee participation had a positive impact on performance, as did profit-sharing. The combination resulted in significant positive association. The positive effects were amplified if the firm was unionized.
Conte and Svejnar (1988)	40 US Frims (Unbalanced Panel 2 to 8 years)	Value Added	Positive impact of involvement in decision-making. Impact of PS depends on regression specification.
Fernie and Metcalf (1995)	2061 UK Establishments (1990)	Measures of Productivity Growth and Change	Combination of EI and Profit-sharing results in best performance for unionized workplaces.
Michell, Lewin and Lawler (1990)	495 U.S. Business Units (1983 - 1985)	Sales per EE (ROI) and (ROA)	PS associated with higher productivity and firm performance.

Chapter 3

Research Methods and Issues

3.1 Introduction

As discussed in the introduction, the general question explored in this thesis is, in a team production setting, where employees may have useful private information, what is that the most efficient way in which to structure the employment relationship? To address this question, I have chosen to focus on employee involvement and group incentives programmes. Chapter 1 introduced the question and in Chapter 2 the theoretical considerations were discussed and the empirical work evaluated. Chapter 3 will overview how the question will be evaluated empirically and explore methodological issues.

In order to evaluate the questions discussed, both econometric and case study analysis will be conducted. The econometric evidence will, within the limitation which will be discussed, allow an evaluation of the extent to which there is an association or even 'causal' relationship between the practices of interest and outcomes. The case study will allow for an evaluation of what is taking place from the perspective of those interviewed at the firm and also overview practical issues, such as legal and taxation issues associated with sharing residual control and return rights with employees.

With respect to the econometric analysis, in order to determine if there is a relationship between the independent and dependent variables, there are three major issues which need to be addressed. The first issue is *measurement error*. Measurement error is a problem if we have not accurately

identified and 'measured' what we plan to test. As will be further discussed, measurement error is a particular problem with research associated with employee participation. The second issue is the issue of omitted variable bias or *heterogeneity*. Omitted variable bias is bias to the dependent variable associated with an unidentified variable or variables. The third issue is the issue of *endogeneity*, or the problem of reverse causality. For example, in research associated with profit-sharing, does profit-sharing cause profitability or does profitability cause profit-sharing? Discussed in Chapter 3 will be how each of these and other issues will be dealt with.

3.2 Research Methodologies

Four forms of research methodology will be used in this thesis in order to evaluate the questions discussed. These include the use of case study evidence, descriptive statistics, correlations coefficients, and regression analysis. The following is a brief overview of each of the four methodologies.

Case Study

In order to determine how these practices actually work in a company, a case study on a firm, which is one of the first in the UK to implement an AESOP is conducted. The case study includes interviewing those responsible for implementing an AESOP scheme and a broad range of employee involvement programmes. The intent of the interviews was to determine why such programmes are being used in their firm, how they are structured and administered and what they expect to gain from these programmes? In addition, company performance trends *before and after* the introduction of the AESOP and a comparison of the performance of firms in the same industry which do not have the same programme will be conducted.

Descriptive Statistics - Means and Standard Deviations

In Chapters 5 and Chapter 6 the mean values associated with the variables of interest will be evaluated. Mean and standard deviation analysis will allow an examination of the variables of interest by the establishment characteristic groupings. For example, evaluating the mean return on asset (ROA) performance of establishments which have a high degree of employee involvement with either the overall average ROA or in comparison with establishments which have a low degree of employee involvement.

Correlation Coefficients

Another type of analysis conducted is the correlation of the independent, control and dependent variables. Whether there is a statistically significant relationship between the variables will also be determined. This type of analysis will allow us to determine the relationship which exists between these variables; to establish if there is a positive, negative or no relationship at all.

Multiple Regression Analysis

The use of multi-variate analysis will allow a more thorough evaluation, which should enable a stronger argument related to determining whether there is a strong association, or causal relationship, between the independent and dependent variables.

3.3 Data-set

This section gives an overview of the corporate performance data-set. (More detail on the establishment, employment practices and worker characteristics can be found in Chapter 5).

3.3.1 Corporate Performance Project Database

The Corporate Performance Project is a longitudinal research project being carried out jointly by the Centre for Economic Performance at the London School of Economics and the Institute of Work Psychology at the University of Sheffield. One of the principal aims of the project is to research how management practices impact the performance of establishments. The project obtains information from manufacturing establishments located in the UK. The establishments have between 61-3,496 employees and all are manufacturing establishments. The project started in 1990 and will be completed in the year 2000. Currently, two sets of data are available. The first period of data collection was conducted between 1992-1994. The second period of collection was between 1994-1996. The data was gathered using on-site structured interviews speaking with each establishment's human resource manager, plant manager, or other production manager. The database contains information on 118 establishments gathered during the first period, from 1992 through to 1994. The second period survey conducted in 1994-1996 obtained information from 60 establishments, 45 of which participated in the first round of data collection.

The data-set contains very detailed information on the types of management practices, the structure of the establishment, the market they operate in, work practices and organisational designs, establishment performance outcomes and human resource policies and practices. Establishment performance outcomes include establishment profits and sales turnover. The questionnaire was designed by both economists and organisational psychologists, and care was taken to find valid and reliable measures of management and establishment performance indicators. Also included in the data-set is information on product market, technological sophistication and management practices which may influence outcomes.

3.3.2 Corporate Performance Data-Set Information Categories

Exhibit 3.1 below lists the information categories found in the Corporate Performance data-set.

Exhibit 3.1

Establishment Information Categories

A. Organisational Overview (Performance Measures)
B. Organisational Structure
C. Market Environment
D. Competitive Strategies
E. Production Technology
F. Work Design
G. Quality
H. Just-in-Time Manufacturing Process
I. Human Resource Management
J. Industrial Relations
K. Equal Opportunity
L. Records
M. Research and Development
N. Organisational Strategy

3.4 Data-set Construct and Issues

3.4.1 Establishment Versus Firm Based Level of Observation

In research associated with employee involvement there is an advantage in using establishment level data over firm-level data. Firm-level data is much more prone to measurement error,

because, for example, the type and success of employee involvement programmes will vary considerably from one establishment to another. Firm-level surveys, for practices such as employee involvement, assume that the practices are the same across all establishments within the firm. This is very unlikely to be the situation, therefore establishment level information is more likely to be accurate.

3.4.2 Extrapolation of Variables in Corporate Performance Data-set

As previously indicated, two periods of data are currently available from the Corporate Performance data-set. This includes the first round of 118 interviews which were conducted in 1992 through 1994; a second round of 60 interviews then took place in 1995 and 1996. Of those establishments interviewed in the second round information was gathered from 45 in both time periods. In examining the control (with the exception of number of employees and assets) and the independent variables there are no variations in these practices between the two periods. Given that there is no change in these practices this disallows for first difference or change over time analysis in the panel data set of 45.

Given that there is no change in the practices during the two periods, it is possible to extend the data-set to include information on the presence of the control and independent variables in future years. That is, if the remuneration practice was in place during the first round of interviews in 1993, and was also in place in the second round of interviews in say 1995, I presume the practices were not discontinued and restarted during the one year in between so there is information on 93 through 95 for that establishment. Given that in 45 of the 118 establishments there were no changes in these practices, I also assume that the same holds true for the other establishments and

hold constant the status of the practices in future periods.[1]

3.4.3 Cross-Sectional Data versus Panel Data

Cross-sectional data is a sample which represents a particular 'slice' of time, the data is gathered at one particular point in time. Panel data, on the other hand, is data gathered time period after time period, allowing researchers to evaluate the impact of change over time.

Panel data which includes variation in the variables of interest allows for 'fixed' effects to be attributed for. Fixed effects may include the impact of difficult to measure factors which remain constant over time and may have an impact on the dependent variable. For example, in the case of examining the economic impact that employee involvement has on performance, if we have, say, a panel set on one thousand establishments over a ten year period we would be able to examine the impact which the start, or 'initiation', of a certain type or form of employee involvement has on performance. It would be possible to conduct a 'before and after' analysis allowing a study of the impact the initiation of a programme has on the performance of the firm or establishment. Provided variables affecting performance, which are not identified, remain constant, having more than one time period allows for the effects of these variables to be controlled and attributed for.

[1] The surveys conducted do not ask when a pay system or human resource practice went into effect so I am not able to conduct a 'before and after' analysis. There is, however, information on performance measures dating back to 1982 for some of the establishments. In order to conduct an analysis which will better control for fixed effects I have recently sent-out a follow-up survey in order to find-out what date the practices of interest were started. While that information is not yet available for analysis, and included in this thesis, none of the establishments which I currently have replies from (approximately 30) have discontinued these practice once they were put in place. This provides supports for my assumption allowing me to extend the data-set.

While the Corporate Performance data-set does contain a 'panel' element, the fact the practices I am interested in examining were not introduced during the time period the panel data-set covers, means I am not able to conduct a 'before and after' analysis. However, there is another means of attributing for omitted variable bias or heterogeneity which I will cover in section 3.5.3 and 3.5.4.

3.4.4 Balanced Panel Data versus Unbalanced Panel Data

To reiterate, panel data is data over time for the same observations over a given time period. A balanced panel consists of the data for the same observation over a particular time period. An unbalanced panel is data over time, but there will either be missing data for some time periods or observations.

3.5 Validity and Reliability

3.5.1 Internal and External Validity

The ideal study would incorporate both internal and external validity. A high level of internal validity would allow us to rule out alternative explanations of what is causing the association we are testing. For example, if we are testing the impact a particular set of practices has on firm performance we would need to rule out the effect any recently introduced technological innovations would have on the outcomes we are measuring. In order to arrive at this type of design you ideally need to have a random sample of establishments. What random assignment does, is guarantee, on average, that other factors influencing performance, such as the quality of

management or cultural work ethic, do not differ between the treatment and control group. This random element should result in the mean difference in performance between the groups reflecting only the effects of the work practices which are being examined.

The second type of validity is that of external validity. This type of validity is primarily concerned with how well we are to generalise our findings. If we are attempting to determine the impact management practices have on some element of establishment performance we would ideally want to be able to have a random sample of firms which have these types of practices (and those which do not) in a single industry. This would allow us to be the most declarative about the impact these practices have on the performance outcomes within this particular industry.

External validity is partially addressed because most of the establishments included in the Corporate Performance data-set are manufacturing establishments. While there is some variety in the types of manufacturing establishments,[2] the majority are engineering establishments. They are also mostly manufacturing establishments which use advanced production technology and a skilled workforce.

3.5.2 Selectivity or Response Bias

Selectivity bias is the tendency for respondents to either reply, or not, based on some mediating factor such as profitability.[3] That is, more profitable establishments may be more prone to reply to questionnaires. Again, the alternative could also be true and less profitable firms may tend to

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[2] See Chapter 5 for a more detail description of the types of establishments represented in the data-set.

[3] See the work of Hausman (1979) for a thorough treatment of selectivity bias.

respond to surveys. This would also have the effect of positively skewing the results. However, without knowing the direction of this bias prior to the analysis, it is impossible to gauge the impact on performance.

The Corporate Performance data-set has scope for selectivity bias. Fewer than five per cent of the establishments approached agreed to participate in this survey. The reason for this was primarily attributed to the fact that the survey was very extensive and took up a considerable amount of time of the senior management within the establishment. While some element of this bias may be present in this analysis, as mentioned, without knowing the direction of the bias there is little that can be done to control for it. However, in evaluating the data-set it is apparent that both profitable and non-profitable establishments are participating in the survey. This may indicate that selectivity bias may not be a substantial problem.

3.5.3 Heterogeneity

One of the principal problems with cross-sectional analysis is unobserved heterogeneity, or omitted variable bias. Heterogeneity bias is the bias caused to coefficients due to factors which are not included in the model which may be correlated with the dependent variable. Leaving out these factors may have the effect of biassing the coefficients. One way to address this issue is by identifying and including as many of the variables as possible which may have an impact on the dependent variable.

In this line of research, which is associated with factors which influence company performance, one of the principal factors often left out is a measure of management quality. The idea being,

if they chose the most efficient human resource practice, they are probably making correct choices in other functional areas. If the omitted variables do not change over time than longitudinal data and the use of first difference, should attribute for these omitted variables. However, according to Huselid and Becker (1995) longitudinal data may well accentuate measurement error, if error is present. Also, if the omitted variables are not stable over time than the only way to eliminate their effects is to identify, measure and control for them statistically.

One way of addressing the issue of heterogeneity is by identifying as many factors as possible which influence performance, and by including them in the model and subsequent regression analysis. I have attempted to do this by including a measure of management quality which I believe will pick-up, and attribute for, management quality.[4]

Due to the extensive nature of the interviews which were conducted it will be possible to include a number of variables which are normally not included in this type of analysis, including a measure of management quality. In addition, the use of random effects specification should further attribute for unobserved heterogeneity.

3.5.4 Fixed versus Random Effects

The fixed effect model is the appropriate model when looking at a specific set of establishments as any inferences are related only to those establishments. This is due to the fact that the population mean for the sample is assumed to be a fixed parameter which can be estimated and the remaining disturbances are stochastic (i.e. subject to change with the remaining independent

[4] See the appendix for Chapter 5, (Strategy) to see how I define this variable.

variables). The random effects model is assumed to be random and is the correct model if you are drawing (n) number of establishments and you wish to draw inferences to the entire sphere of establishments.

It is generally agreed[5] that the fixed effects model is appropriate when inference is to be made only in relation to the sample examined. Fixed effects would be the suitable model to be used when a researcher is attempting to examine one particular firm or one particular set of countries. Random effects is more appropriate when the intent is to generalise the conclusions outside of the sample. It is apparent that the more appropriate model is the random effects model because the intent is clearly to generalise the findings outside the sample.

3.5.5 Measurement Error

Measurement error is error associated with not actually measuring the concept you are attempting to test. This is very often a problem when attempting to measure employee involvement. Most surveys are firm-based and ask each organisation if it has a high degree of employee involvement. Firm level questionnaires tell us virtually nothing about what is actually taking place regarding participation in establishments.

The Corporate Performance data-set questionnaire is establishment level and contains questions which allow for an accurate read on the actual level of control and involvement in job tasks. This should help eliminate the effects of measurement error.

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[5] See Green (1993) Hsiao (1986) and Baltagi (1995).

3.6 Chapter Summary

As discussed in the introduction, the three primary methodological issues which I address in order to prove as conclusively as possible that the variables of interest are *causing* the results seen include: measurement error, heterogeneity and endogeneity. Given that the data-set is establishment rather than firm-based, this will allow for a more accurate read on the existence of the independent variables of interest. Measurement error will also be reduced due to the choice of independent variable (i.e. decentralization of tasks). Unlike other forms of employee involvement, decentralization of tasks is a concrete and identifiable form of employee involvement, either the shopfloor workers have authority to act or they do not. The second issue is of omitted variable bias or unobserved heterogeneity. In order to directly control for omitted variable bias a measure of 'management quality' is taken and included in the regressions. Firms which correctly choose the most efficient human resource policies may also choose the correct marketing, operational and financial strategy. This should control, in part, for one of the primary factors thought to affect establishment performance. Additionally, the random effects model is a way of further attributing for unobserved heterogeneity. The empirical work is conducted using both standard ordinary least square and the random effects models. Another potential problem is the issue of endogeneity or reverse causality. The issue is, do higher profits cause payment systems such as profit-sharing, or does profit-sharing cause higher profits? While ideally, one would like to identify suitable instruments and check for reverse causality, no suitable were identified. Another way in which to address this issue may be through the use of lag variables. This clearly separates the decision to use a particular form of remuneration with future profitability. Time lags are used in both the empirical Chapters to partially control of reverse causality.

The case study used is of a firm which is one of the first in the UK to put an All Employee Stock Option Programme in place, and which also uses an extensive amount of employee involvement or communication programmes. The case study is meant to complement the econometric work in order to explore the practical issues associated with the transferring of residual control and residual return rights to employees. In addition, there is an evaluation of how well this firm is performing in comparison to other firms in the same industry which do not offer stock options to all their employees.

Chapter 4

A Case Study of an All Employee Stock Option Programme and Communication Programmes at a UK Retail Firm

4.1 Introduction

Stock options[1] are often associated with either executive compensation or remuneration in cash-strapped high technology start-ups. There has, however, been an increased use of stock option programmes outside of high technology firms and for employees other than executives. Participation in decision-making and employee communication programmes are also becoming more common. These include such practices as suggestion schemes, small group information sessions and autonomous work groups (Cotton, 1993). Additionally, there is increasing evidence that financial participation works better when used in combination with participation in decision-making (Ben-Ner and Jones, 1995; Blinder, 1990).

In this case study, I provide some insight into why a firm would choose to put a stock option programme in place and also evaluate the impact of the programme. The first part of my analysis is associated with 'why' they would choose to put these programmes in place. Interviews with employees provided a basis to evaluate theoretical considerations. I had the opportunity to speak with a number of employees including the Share Scheme Manager, the Employee Relations

[1] The Inland Revenue as: ' Employees (being) given the right ('option') to buy at a future date a certain number of shares at a price fixed when the option was granted'. In practice, if the shares appreciate in value over the required holding period the employee 'purchase' the shares and is allocated the difference between the previously fixed price and the current appreciated level. If the shares depreciate in value over the required holding period, the employee simply chooses not to exercise their right to purchase the shares so there is no cost to the employee.

Manager and the Coordinator of the Employee Suggestion Scheme. I also had the opportunity to speak with a store Human Resource Manager, and a number of shopfloor hourly colleagues. In the second part of my analysis I evaluate and compare the changes in performance, both prior to and after the introduction of the broad-based stock option programmes and extensive communication programmes. The performance relative to competitors is also evaluated.

There is good reason to be interested in this type of financial participation and the extensive use of communication programmes. Firstly, at the case study firm, the grant proportion is 25 per cent of base salary. Employees are eligible to exercise 50 per cent of the shares after three years and the remaining 50 per cent after six years. Since the inception of the All Employee Stock Option Programme (AESOP) the stock has increased by more than 100 per cent. According to Bradley et al. (1990) profit-sharing bonuses for sales assistants rarely exceed a maximum of four per cent of basic salary.[2] Given the potential bonus levels reached at the case study company the incentive effects and the corresponding impact on profit-maximizing behaviours could be substantial. Secondly, in the UK, the employee turnover rate within the retail sector is high. At the case study company there is a three- and six-year vesting period associated with the stock option programme. Basis Freeman's (1976) argument, an ownership programme which has a required vesting period (three years for the case study company) such as a stock option programme may reduce turnover and encourage the formation of firm-specific human capital.[3] Thirdly, following Weitzman's (1984) argument, if profit-sharing reduces the marginal cost of labour and correspondingly promotes employment expansion, or reduces the need for firms to make

[2] The one well documented exception to this in London is John Lewis Partnership which pays an annual profit-sharing bonus in the order of 20 per cent of base pay.

[3] While Freeman's argument was associated with unionization the principle would apply in the case of employee share ownership.

employees redundant in times of economic contraction, stock option programmes, which are a cost-efficient way to deliver compensation, may have potential for capturing these theorised employment effects.[4] Fourthly, the gap between the highest and lowest paid is at its highest level since the start of the century (Machin, 1996). AESOPs may have potential for increasing employees' overall earnings. Finally, the feedback effects associated with these types of communication programmes may also be substantial (Ben-Ner and Jones, 1995). Those who have a stake in the company may be more likely to be involved in a communication programme, actively seeking ways in which to cut costs, serve the customers better and generally look for ways in which to increase efficiency. Communication programmes may also signal to employees that their input is valued and help develop the co-operative 'corporate culture' which Weitzman refers to as being needed to help eliminate the incentive diluting effects of the free-rider problem (Weitzman, 1995).

4.2 Case Study Company

4.2.1 Sector and Case Study Company Background

The case study company operates in the UK grocery trade which currently accounts for nearly 40 per cent of all UK retail sales. The sector has also become considerably more concentrated with four firms (the case study company is one of the four) accounting for 65 per cent of an annual market valued in excess of £90 billion. There has also been growth in the number of superstores in the UK from 457 in 1986 to 1,102 in 1997, accompanied by a substantial decline in the overall

[4] Given the high european unemployment for the low-skilled workers a company such as this which operates in this labour market is of special interest.

number of grocery stores; 147,000 in 1961 to 29,000 in 1997. It is predicted that competition will remain intense with a focus on price and service. Profit margins will be under pressure and while there is continued scope for consolidation, this will occur mostly within the convenience end of the market. One of the four largest players in the market launched a free home delivery service, which, it is thought, may result in an escalation of price competition. It is speculated that in the near future home shopping via the internet will be focussed in dry goods rather than fresh foods.[5]

The case study company was founded by two brothers in a former Bingo Hall in the Yorkshire region of England, approximately 200 miles north of London. In 1965 the two brothers consolidated with another partner and formed the company as it is known today. The stores quickly established a reputation for branded goods, at low prices in very convenient 'one-stop' shopping centres. While today the company is primarily associated with food sales, in 1970 only one third of their floor space was used for food. In 1977, the company opened its first store around London and started a new focus on making their stores both attractive and functional. By the mid-1980s the focus had become to develop 'customer friendly' stores with increased level of customer service.

Two decisions in the mid-1980s set the stage for future financial difficulties including, an unsuccessful purchase of another retailer and an attempt to go upmarket, which resulted in alienation of its customer base. In the late 1980s and early 1990s the company found itself in a position of near bankruptcy. It was losing market share to competitors, its share price had dipped to a low of 22 pence per share and the company was deeply in debt. In 1991, a new Managing

[5] The analysis provided here is largely provided by 'Verdict Research Limited' (1998) and the Financial Times Retail and Consumer Report, 'European Retail Analyst' (1998).

Director and Group Chief Executive was appointed. In 1992, the company launched a three-year recovery programme with the objective of returning the company to profitability. The first year of the recovery programme was called 'Establishing the Platform', and consisted of establishing a good financial and organisational foundation on which to build. The recovery plan consisted of a re-focus on the core superstore business and on achieving financial stability. In order to accomplish this a rights issue took place, a number of non-core businesses were sold and more aggressive cash management was adopted. In addition to the structural and financial management changes a re-focus on winning back the traditional customer base was put in place which entailed a new focus on customer service and refurbishing stores. The second year was labelled 'Evolving the Format' and continued the focus on prudent fiscal management, restructuring and customer satisfaction. The final year of the three-year programme and the start of the next three-year emphasis was labelled 'Breakout' and was largely characterised by a focus on growth and capitalising on the changes which had been put in place during the previous three years.

4.2.2 Corporate Changes

In addition to substantive changes in fiscal management and restructuring, the company changed the corporate culture. According to the Chief Executive, by the late 1980s the company had, *'too many layers of management, narrow functional attitudes and a controlling bureaucratic head office culture'*.

A number of activities were put in place to institute these cultural changes. These included:

(i) *a style of management in the stores that was becoming less authoritarian and more respectful of colleagues at all levels,*

(ii) *reduce management headcount,*

(iii) *improve communication at all levels.*

There was the recognition that front-line employees were the key to much of the focus on customer service and customer satisfaction. The company moved towards a philosophy of harmonisation which included referring to all employees as 'colleagues' and eliminating barriers between salaried and hourly employees.

Two of the major changes associated with this corporate culture change included the adoption of extensive employee involvement and communication programmes and, in 1995, the adoption of a stock option programme for all employees.

4.2.2.1 Employee Relations Programmes

According to an interview with the Manager of Employee Relations, the principal reason for putting employee suggestion programmes and involvement programmes in place was. ' *away from work our colleagues may be magistrates, council or scout leaders, they have all sorts skills, ideas and suggestions that could help the company succeed.* '

It was believed that employees who were in closest proximity to the customer would have valuable information on customers' preferences. Not only was there recognition that information should flow from employees to management, but also that information should flow from management to employees. As a result both bottom-up and top-down communication mechanisms were put in place. Top-down communication programmes because it was felt employees should know how well the business is performing, and should be made aware of any changes which may affect them.

A number of different communication programmes were put in place, all with the intention of keeping employees informed and allowing management access to valuable information which employees may have (Table 4.1 details the various programmes). A 'suggestion' programme involving all employees has been in place since 1993. There is an average of 250 suggestions made each week. Each suggestion is reviewed in order to establish whether or not it is feasible to implement. Approximately 5 per cent of the suggestions are put in place. Employees obtain points for making suggestions which are implemented and they are then able to use the points for gifts. Each person who makes a suggestion receives a signed personal letter from the Chairman. The Human Resource Manager interviewed indicated that the company suggestion scheme was considered one of the best in the country and She believe the success of the programme was largely due to the support of the Chairman.

There are a number of information sessions with employees that are meant to promote free information flows between various levels in the organisation. At the beginning of each daily shift the employees and their supervisors gather for a short five minute 'huddle' where employees are

asked if they have any questions, or if there are any issues which need addressing. Employees are also given any information from their supervisor about the company which would be of interest to them. In addition to the daily 'huddles' there are monthly meetings for all colleagues. These meetings last between 20 and 30 minutes and are an opportunity for management to convey company financial and other information to employees and also for employees to give feedback to management. In addition, each store holds a monthly 'colleague circle' aimed at addressing store-specific issues raised by colleagues. While the intention of the monthly meetings is primarily to convey 'top-down' information, the intention of the 'colleague circles' is to convey information 'bottom-up' to management. There is also an annual survey called the 'We're Listening' survey which is a morale survey covering employees.

The five hourly employees at the store I spoke to included one with ten years' experience at the store, two with nine years' experience, one with six years' experience and one had only worked for four months. The longer term employees I spoke to confirmed that there had been considerable changes in the culture of the organisation since they had started working and, in particular, there had been a notable effort to push decisions down to lower levels in the organisation. For example, any colleague in the store had the authority to refund a purchase which a customer found to be unsatisfactory. While this level of trust was appreciated by the employees, they had mixed feelings about the greater responsibilities which they had. The hourly employees felt that along with this increased trust came greater stress because more and more duties were being added to their jobs. On the other hand, the hourly employees felt that their store managers were 'in the same boat', and were under as much pressure as they were.

Management also had mixed feelings about the decentralization of decisions and the 'flattening' of the organisation. In addition to greater pressure due to more responsibilities, middle level managers sometimes found it difficult to see a clearly defined career path. Turnover for the middle level managers was high; approximately 50 per cent of new middle managers level in the first 12 months. According to the manager I spoke to this was attributed to the relatively low base wage and the sometimes ill-defined career path.

In addition to an array of communication and involvement programmes, the company has a variety of other employee relation programmes. They offer considerable flexibility in work hours. Parents of school children are allowed to reduce their hours during school breaks and the firm allows university students to work during breaks. All the employees spoken to commented that the flexibility the company exhibited was highly valued by them. There is also a subsidised meals programme and a healthy living programme. The headquarters themselves are open-planned with no dividers between desks, which is meant to foster the free flow of information. The board room has glass walls and there is a meeting room which has no chairs and a chest-level table which is used for 'standing' meetings. The intention is to keep the meetings short and to the point.

4.2.2.2 The Share Scheme

According to an interview with the Manager of Share Scheme the reason the AESOP was put in place was the following:

'We put the stock option programme in place with an objective of getting 65 per cent of the colleagues to be holders of stock and owners of the firm. There is the belief that owners will identify more closely with the firm and this in turn will result in greater loyalty, and also promote an environment of customer service. Another reason for starting the programme is we were hoping it would help reduce employee turnover.'

According to the Share Scheme Manager the primary intention of the stock option programme was that it would provide an additional mechanism which 'helps people think and act like owners'. Management at the company felt that having employees holding shares in the company would result in greater effort, greater loyalty and help 'promote an environment of customer service'. Management considered there to be a concrete link between employees having shares in the company and the level of effort employees would put forth. Additionally, management believed there to be a connection between a stock option programme and the likelihood that employees would not quit. Finally, there was the belief that 'owners' would conduct themselves differently in respect to how they treated customers. These beliefs by management were all predicated on the assumption that employees would see a concrete link between their jobs and the success or profitability of the company. The Share Scheme Manager said the AESOP was also seen by management as a way of eliminating barriers between employees and management.

There was the belief that if executive stock options helped motivate management, why would they not provide an incentive for *all* employees?

Since the early 1970s there has been an executive share scheme which included less than the top one per cent of the company's employees and could issue up to four times base salary in company shares. In 1978 a Save As You Earn Share Option Scheme (SAYE) was put in place for all employees. While SAYE schemes are similar to AESOPs, in that they place shares in the hands of employees, AESOPs differ from SAYEs in that employees do not put up any of their own money. With SAYE schemes employees make monthly contributions of between £5 and £250 which is held in a trust. At the end of the contract period they are allowed to buy shares at a pre-determined value, or if the shares have depreciated in value they are given the amount they have put in the trust plus any interest. At the time the SAYE scheme was introduced, there was a profit-sharing plan in place which had not made a payment for a number of years. In 1995 a stock option programme was established for all employees at the same time as the profit-sharing plan was eliminated. Table 2 presents the details and conditions associated with Share Schemes.

Under the AESOP all employees with 12 months tenure are eligible to participate in the programme. Employees are also required to work a minimum of 15 hours per week. The rationale for this requirement is to get people to contract for more hours. Management thought one of the principal reasons why people quit was because they did not identify closely with the organisation. By getting people to work more hours it was hoped they would become more active members of the organisation and be less likely to quit. The hope was that this requirement would result in a reduction in head count (e.g. fewer employees working more hours).

The employees interviewed supported this belief by management that the AESOP and SAYE programmes were likely to make employees pause when considering leaving the company. This was not the case for employees who had been employed less than one year, however, those with greater length of service felt tied to the company due to the possibility of losing the benefit associated with the share ownership. This was not necessarily viewed positively by the employees; some said they felt 'trapped' or 'bound' by the company due to the vesting requirements of the AESOP and SAYE programmes.

The SAYE programme has a three and five year vesting period and the non-executive stock option scheme has a vesting period of three and six years. While vesting periods are Inland Revenue determined, the company hoped that this requirement would help reduce employee turnover. The 25 per cent of base salary is calculated as 25 per cent of annual contracted earnings,[6] and employees are eligible to exercise 50 per cent of the options after three years and the remaining 50 per cent after six years. The share price at the time the option is granted has to be the market rate. In the SAYE programme there is a 26 per cent involvement rate. In the stock option programme there are 52,000 colleagues enrolled in the programme out of a potential 74,000. The reason there is not 100 per cent take-up in the all employee stock option programme is some of the employees have not been employed for 12 months or because they do not work the required 15 hours per week. While some companies attach specific individual, team or establishment performance targets to the allocation of options, this firm does not attach such targets to its AESOP. If an employee leaves the company due to ill-health, incapacity or

[6] For example, a clerk in London earning £4.50 per hour who is contracted to work 20 hours per week would be granted £1,170 options (£4,680 x .25). This would mean that if the price of the option was set at 90 pence per share and if the shares doubled in price to £1.80 over the three year vesting period, the employee would be eligible to buy the shares at 90 pence and retain the 50 per cent difference.

retirement he or she may be eligible for a reduced number of shares. If they leave for any other reason they lose the option to receive shares. If the employee dies the next of kin will be able to take up the option within 12 months of the death. If the company is taken over the new company may allow the option holder to 'roll over' their options from the old company to the new company. The value of the new options must have the same value as the old options, and original rules and conditions will apply to the new options.

According to management, the institution of an AESOP was seen as a way to keep labour costs low. The case study company does pay the lowest base rate when compared to its four rivals (see table 4.7). Graph 4.13 also shows that the case study company has the lowest annual salary per employee among four competitors. These figures *do not* include any earnings from an AESOP programme. All of the employees who were asked if they were satisfied with their base wages responded that they were not satisfied. They did not view any income from either the AESOP or the SAYE as part of their basic pay but rather as a 'gift'. A typical comment was,

> *'They (management) have to understand that we have to live on what we make. Our wages are not 'extra' money. If there is extra money from something like the 'AESOP' or the 'SAYE' we will use it for a holiday.'*

However, when asked if a competitor were to open a store right next door paying 10 per cent more but not offering free shares, would they quit and go next door. The replies included:

'No, this place has become like an old pair of slippers over the years.'

'Yes, however, I might come back if they (the competitor) made me call the supervisors Sir and Madam.'

One other stipulation which the case study company has with its AESOP is that after the three and six year required holding period there is an 'auto-exercise' mechanism in place. The way in which this works is, after the three year holding period, if the stock has appreciated in value the options are exercised automatically for the employees and they are given the profit in the form of company shares. If the stock depreciates in value the shares are not given to the employees so there are no costs to them. While this mechanism automatically exercises the options for employees, any profits issued to the employees are in the form of free shares which they can choose to hold or sell. According to management, employees will be encouraged to remain share-holders in the company. However, if employees choose to sell their shares the company will help them to do this through a discounted brokerage.

According to sources at the firm the rationale for putting an 'auto-exercise' mechanism in place is two-fold. Firstly, this mechanism will greatly simplify administration for both employees and for the company. From the company's perspective it is much easier administratively if all 54,000 employees choose to exercise their options at the same time. It was also thought that it would be much easier for the colleagues who may not be very familiar with how to approach the use of options to have them exercised automatically. Additionally, the company will be able to re-coup its investment at a predictable point in time. This 'auto-exercise' mechanism does not apply in

the case of the 'executive stock option' programme.

The non-executive stock option programme differs from the executive option programme in several ways. In the executive plan there are no tenure requirements, and the cash-out periods are three and four years.[7] More detail on the difference between the executive and broad based plan can be seen in table 6.2. According to sources at the firm, one of the principal reasons an AESOP was put in place was to help eliminate barriers between employees and upper management.

Hourly employee reaction to the stock option programme was very positive and they expressed gratitude at what they perceived as a free gift. They also said the reason they thought it was a good idea was because it made them feel appreciated. When asked if the work they did had any impact on the share price they said *no*, however, when asked if the job they did had an impact on the bottom-line, they all answered *yes*. However, they also said that the existence of a stock option programme and their owning stock did not have an impact on the way they carried out their jobs (e.g. effort level or level of customer service).

4.3 Background and Trends of Share Option Schemes and Employee Communication Programmes

4.3.1 Stock Option Programmes

[7] The company determines who participates and at what level, subject to a maximum of 4x base salary .

4.3.1.1 Individual Tax Implications

The tax implications for discretionary share option schemes in the UK were changed in 1996. Prior to 1996 employees were given the right to buy options at a future date at a price fixed when the option was granted. The company could decide who was eligible to participate. The value of the options held by an individual was limited to a maximum of £100,000 or four times the person's base salary. The option price could be set as low as 85 per cent of the market value of the shares at the time the option was granted. The employee did not pay income tax on any increase in the market value of the shares when the option was exercised. To qualify for this tax treatment the option could not be exercised less than three years, and not more than ten years, from when the option was granted. Capital gains tax may have applied when the options were exercised.

Discretionary share option plans were replaced by company share option plans in 1996. While the company is still free to decide who participates in these plans, a £30,000 ceiling was placed on the amount eligible for tax relief. Also, the value of the shares cannot be discounted below the market price.

4.3.1.2 Corporate Tax/Profit Implications

There are two ways in which an employer can issue shares to employees. Employers have the choice of either purchasing existing shares or issuing new shares. One criticism associated with stock options for all employees is that setting aside large numbers of shares will dilute earnings,

negatively impacting current shareholders.[8] However, it is argued that the number of options exercised at any one time is going to be small, thus limiting this dilution effect.

This form of remuneration delivery may be a very cost-efficient way for companies to deliver compensation. The company chooses to either issue new shares, subject to the 10 per cent limit over a ten year period, or to buy back existing shares. When the shares are appropriated to employees they are put in a trust and provided the shares appreciate, at the time employees exercise their options the company recovers its original investment. In addition, costs associated with option programmes are legitimate business costs which are fully tax deductable.

In the UK and the US the accounting practice associated with stock options has recently caused some controversy. This is due to corporate profits being 'inflated' because accepted accounting practices allow stock options not to be charged against the profit and loss accounts (see table 6.3 for example) . In addition, there are circumstances when expenses incurred from stock options can be used as a tax deduction, for instance, the interest payments on a loan taken to pay for stock options can be taken as a tax deduction and in turn seen as profit. This results in an overvaluation of individual companies. In the US, where stock option programmes are more widespread, it is also contended that because individual earnings from these programmes are not reported in national accounts, wage inflation may be 2 per cent to 3 per cent higher per annum.[9] In the UK,

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[8] Guidelines for all employees shares are set by the Association of British Insurers and the National Association of Pension Funds. Over a ten year period newly issued shares cannot exceed 10 per cent of the company's ordinary share capital.

[9] A report by Smithers & Co. Ltd., 'USA: The Impact of Employee Stock Options' recalculates profits of 100 US firms when stock option costs are charged against profits. For example, Microsoft's reported profit of $2.8 billion in 1996 changes to a $10.2 billion loss. More detail on company overvaluation and the impact this accounting practice may have on unreported wage inflation can be found in the report. Another report, by Bears Stearns reported in the May 13, 1998, issue of The Wall Street Journal Europe, using a more conservative methodology, recalculates Microsoft's 1997 operating income from $5.1 billion w/o option to $4.7 including

where stock option programmes are not yet as widespread, it is doubtful there is any significant impact on wage inflation, although the individual company overvaluation may apply.[10]

4.3.2 Trends for All Employee Stock Option Programmes and Employee Communication Programmes

4.3.2.1 Stock Option Plans

Until recently, stock options were used largely for only executives and senior managers. This is changing in both Europe and the US. According to a survey conducted by the Association for Quality and Participation in 1995, 13 per cent of Fortune 1,000 firms in the US offered stock options to 60 per cent or more of their employees. The trends are similar in the UK. Graph 4.1 shows both the newly approved discretionary share option programmes in the UK between 1984 and 1996 and a cumulative total. While the vast majority of these option schemes are associated with executives, AESOPs in the UK are also increasing. According to a recent survey by New Bridge Streets Consultants, the number of AESOPs in the UK has increased five-fold from 5 - 25 between 1994 and 1997.

4.3.2.2 Employee Communication Programmes and Involvement Programmes

See Chapter 1.0, section 1.4.2 for a summary of the trends associated with employee involvement

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options.

[10] The case study company reports the costs associated with the AESOP in its company accounts.

programmes in the UK.

4.4 Previous Research and Theoretical Considerations

4.4.1 Previous Research

I have not been able to find any case study or econometric research examining the economic impact of AESOPs. There has, however, been substantial work in the UK and US associated with the economic impact which various forms and levels of executive compensation have on the performance of the firm. While there is a fair amount of UK evidence (Conyon et al. 1995; Conyon and Gregg, 1994; Conyon and Leech, 1994; Gregg et al. 1993) associated with the impact of executive remuneration on the performance of companies, this has mostly been limited to examining the impact that salary and bonus have on performance. This may largely be due to the fact that until recently information has not been available which allows the evaluation of the impact of share options on performance.

In a comprehensive review of the literature on various forms of employee ownership Kruse and Blasi (1996) find ten studies on US ESOPs.[11] They do not find there to be a strong positive relationship between ESOPs and company performance. This result is largely supported by further work by Blasi, Conte and Kruse (1996) who find only a small difference in the performance of firms which have more than five per cent employee ownership compared with

[11] ESOPs, or Employee Stock Ownership Schemes, in the US are one form of employee ownership. They are often associated with 'retirement savings' programmes, which place shares in the hands of employees. However, employees or their beneficiaries do not often have access to these shares until they retire or die.

all other firms.

While the legal form differs and they use the traditional form of profit-sharing, research into the John Lewis Partnership may provide a useful insight into the potential effects of broad-based profit-sharing. In their book, Bradley and Taylor (1992) present a detailed case study at the John Lewis Partnership.[12] Employees in the John Lewis organisations are considered formal partners with rights of ownership, including the right to decide if the chairman stays and the right to a portion of the profits. According to the authors, since the company's early days, the Partnership has focussed on employee's 'enhanced financial remuneration, improved flow of information, and service as a key commercial goal.' While it could be argued employees are not full partners in the traditional definition as they share little risk (e.g. they are not liable if the concern is declared insolvent) they do have a greater remit than employees in traditional capitalist firms. The case study finds that the John Lewis Partnership ranks near the top of its competitors in performance indicators, such as profitability and productivity.

4.4.2 Theoretical Overview

Two issues addressed in this case study are, why would this company, which operates in a low-wage, low-skill labour market, offer stock options to all employees, and what is the impact of these programmes on economic outcomes? Previously discussed, from the perspective of the company, is why the firm chose to put these practices in place. This section will overview some of the theoretical issues regarding the determinants of the usage for these practices and what

[12] Also, see the article by Bradley, Estrin and Taylor (1990) in Industrial Relations.

theory would say about their potential impact on economic outcomes.

4.4.2.1 Determinants of Employee Involvement and Share Schemes

The first issue of interest is, why would a service sector firm hiring mostly low-skill, low-pay employees decide to put a stock option scheme in place and employee involvement practices in place? There is little work on why a firm would choose to put an all employee stock option programme in place, however, there is more work on why a firm would choose to use a group incentive scheme such as profit-sharing. A helpful framework associated with explaining why a firm would choose a particular set of human resource, or remuneration practices, is provided by the New Economics of Personnel[13] (NEP). The NEP literature suggests the decision to use a group incentive scheme is part of a larger decision to put an entire set of practices into place. These practices include teams, job rotation, TQM and quality circles (Osterman, 1994). According to Osterman, there are company characteristics which make it more likely for an establishment to choose to put these practices into effect. These factors include being in an internationally competitive product market, having a technology that requires a high skill-level and following a strategy which emphasizes service, variety and quality, over low-cost. According to NEP, a firm's choice to select a particular incentive scheme is also associated with the production technology and the make-up of the workforce. This view suggests that as the monitoring of the workforce becomes more expensive firms will choose to put group incentive schemes or profit-sharing into place. This is the view largely supported by Milgrom and Roberts (1992) who would support the use of variable pay in settings where it is difficult or costly to

[13] For a comprehensive overview of the New Economics of Personnel see the October 1987 issue of the Journal of Labor Economics.

accurately measure effort. A somewhat contradictory position is held by Lazear (1995) who suggests when quality is difficult to observe it may be more efficient to pay basis input (time on the job) versus output (some measure of output), because quality may be sacrificed for quantity. However, Lazear's position applies to piece rates where the measurement of output is relatively inexpensive.

Regarding the use of employee involvement programmes Lazear (1995) suggests that the decision to use these programmes is related to a number of factors including analytical ability of employees, complexity and value of information in their possession and the costs of communicating this information. If the tasks are complex, if employees have the necessary skills and abilities to make decisions and communication costs are high, employee involvement may be the most cost-effective option.

There are conflicting views from theory on why a firm such as the case study firm would use AESOPs and employee involvement programmes. The case study company hires primarily low-skilled workers which contrasts with the prediction of NEP which suggests profit-sharing and involvement are most appropriate for companies with high-skilled workers. However, there is a very clear focus on customer service,[14] and given that it would be very expensive or impossible to monitor the customer service (e.g. helpfulness) of all hourly employees, using a group incentive system may help provide a substitute for monitoring.[15] Regarding why this firm would

[14] According to the store Human Resource Manager, the selection attributes for hourly colleagues, includes people who are 'positive', 'customer oriented', 'and work well in a team'. While it may well be that profit-sharing promotes mutual monitoring, the 'customer service' of hourly colleagues may be partially due to personal attributes screened during the selection process.

[15] Some support for this view may be found in recent work by Fernie and Metcalf (1996) who found telephonists in call centres being paid partially performance-related pay even though their work was extremely closely monitored. It may be that monitoring 'service orientation' is impossible or very costly.

choose to use employee involvement practices, it may be that employee's proximity to the customers may provide them with customer preference information which may be of value to management who are in less direct contact with customers.

4.4.2.2 Theoretical Overview of Performance Effects of Employee Involvement and Group Incentives

Stock Option programmes, commonly used with executives, are normally established in order to counter one of the fundamental incentive problems of economic organisation: the principal-agent problem. The principal-agent problem recognizes that the best interests of the owners are not necessarily the same as their agents. One mechanism used to bring the interests of these two parties into closer alignment is the allocation of stock to agents. This should result in the efforts of these agents being directed towards maximizing shareholder returns. The use of AESOPs are meant to provide these same incentive effects, not only for executives, but for all employees.

In evaluating issues associated with the incentive effects of employee stock option programmes, one of the first major problems associated with the use of any group incentive programme is the free-rider problem. As the number of employees increase there will be a corresponding dilution of any incentive effect. It is clearly understood from motivational theory that for there to be an impact on productivity-enhancing behaviour there needs to be a transparent connection between a person's behaviour and the rewards. The free-rider problem recognizes that in settings where profits are shared among many this connection may not be very apparent.

Conte and Svejnar (1990) argue that employee share schemes may be better at providing a clear

link between effort and profits, thus capturing efficient market effects better than other forms of profit-sharing. For example, profits may be reduced due to depreciation charges associated with a large capital investment. In an efficient market the stock price may better reflect future profits, thus providing a clearer link between effort and profits.

The standard argument in economics used to address the incentive diluting effects of the free-rider problem is taken from game theory. Game theory recognises that while a non-co-operative solution is possible, everyone is better off if all work hard so as the game is repeated over and over, eventually a co-operative solution may result.

The other means of addressing the free-rider problem is by adding more monitors. While the normal way in which this is accomplished is by hiring more supervisors, this is expensive. There is some evidence that there may be cheaper alternatives to adding formal monitors. This would essentially consist of employees monitoring themselves and others. Weitzman (1995) argues that developing a co-operative corporate culture may help in reducing the effects of the free-rider problem. In an employee-owned firm, the Spanish Mondragon communities, Bradley and Gelb (1980) found monitoring costs were reduced because workers tend to engage in 'horizontal' monitoring.

Other theoretical considerations include the lowering of information costs because managers' and employees' interests are more closely aligned. This recognises that employees have access to information which may be valuable to management. The presence of a group incentive scheme may result in employees having the necessary incentive to communicate, or act on their superior information. The majority of the research associated with information sharing has been

evaluating top-down information sharing (Kleiner and Bouillon, 1988; Morishima, 1991). While Kleiner and Bouillon did not find a positive effect of information-sharing on performance measures, Morishima found that there was a positive association with information-sharing and profitability and productivity. Another issue, according to Conte and Svejnar (1990), is that more productive employees may sort to firms where more compensation is placed at risk. Additionally, the argument from efficiency wage theory may apply: due to the higher wage rate, employees who work for firms which pay above the market rate may be less likely to quit and more likely to exert maximum effort.

In addition to the possible impact of broad-based stock options on productivity, the same macroeconomic employment effects of profit-sharing may apply to stock option schemes. The essential argument put forth by Weitzman[16] is that by including a variable pay component related to performance, marginal labour costs are reduced, resulting in less need to make people redundant in times of economic downturns and increasing the incentive for employers to expand employment in economic good times. Given a firm's investment is returned when the options are exercised, provided the shares have appreciated, stock options are an inexpensive way to deliver compensation. The fact that stock options may be cost effective may mean this form of profit-sharing has scope for realizing Weitzman's theorized employment effects.

These theoretical considerations do not give a clear prediction regarding the effect all employee stock options, combined with employee involvement, will have on company performance. However, all of the case study companies competitors detailed in table 4.6 use some form of

[16] See Weitzman's 1985 article in the American Economic Review for a thorough treatment of the macroeconomic effects of profit-sharing.

contingent pay for their hourly employees. Additionally, one of the case study companies competitors have put an AESOP in place for all hourly employees.[17] The fact that these contingent pay systems are this common may support the perception that there is a positive association with performance.

In the next section some of the broad trends and associations which these programmes may have on earnings will be evaluated along with the changes in performance at the case study company since the adoption of stock options and extensive employee involvement programmes. Additionally, how the company is performing in comparison to competitors which do not have an AESOP in place, employee turnover and employee attitudes are evaluated.

4.5 Analysis of Performance Indicators

4.5.1 An Example of Impact on Earnings

The hypothetical example in table 6.4[18] compares the earnings of an individual at an AESOP firm with a non-AESOP firm. The example assumes the person at both firms earns £4.00 per hour in year one, the hourly wage at the hypothetical non-AESOP firm one increases three per cent per year and the hypothetical AESOP firm two increases at two per cent. Employees at both firms are contracted to work 30 hours per week, and there is a 12 month eligibility requirement for the

[17] Per a phone conversation with the manager of compensation and benefits at the second company, part of the reason they put a AESOP in place was because of the perceived success of the case firm's programme. Additional reasons included the need to find 'tax efficient' ways of delivering compensation and the hope this programme would reduce employee turnover. In addition, unlike the case study company, the second company ties the number of shares issued to the 'customer service rating' the store receives.

[18] Given that employees are often given stock options again after three years, this example is very conservative.

AESOP. In firm two, which has the AESOP plan, the following assumptions apply: the share price doubles in the first three years and increases by 50 per cent at the end of the next three; the vesting period is three and six years; employees are eligible to exercise 50 per cent of their options in the third year and 50 per cent in the sixth year and the grant amount is 25 per cent of contracted earnings. Table 6.4 shows that while the annual base salary earnings are higher at firm one, the AESOP firm, firm two, makes a payment of 12.5 per cent of base salary (based on base salary in year one) in year four and in year seven a full 25 per cent of base salary is paid. While a stock appreciation of 100 per cent during the first three years and an additional 50 per cent after six years may sound ambitious, given the phenomenal growth in the stock market in recent years, this rate is not unrealistic for some companies.

4.5.2 Outcome Measures

According to the annual morale survey (table 4.5) there is a high degree of affiliation with the establishment (Q1; 88 per cent). There is also a strong sense that the customers are the focus of the establishment (Q5; 94.8 per cent) and (Q6; 95.4 per cent). Also, the employees have a strong identification that the work they perform has a direct impact on the performance of the establishment (Q7; 85.7 per cent). The response to question seven is notable because the theorized incentive diluting effects of the free-rider problem may not be an issue at the case study company. However, while employees believe their actions effect the bottom line, this does not mean they necessarily act. Though they may be more likely to do their part in increasing profits now that they share in those profits.

While these responses taken by themselves are of interest, it is helpful to see how they compare

to the satisfaction level of employees at competitors in the same labour market and industry. Some recent work by Brown and McIntosh (1998a) evaluates job satisfaction in the service sector. One of the firms participating in their study is a competitor of the case study company. While the scale differs,[19] there is some similarity between the questionnaire items. For example, in the survey used for the job satisfaction survey, only 14.9 per cent of the employees responded with either a 1 or 2 when asked if; 'All in all I am satisfied with the job'. Only 19.3 per cent responded with either a 1 or 2 when asked if; 'The company is a good employer'. While these questions do not allow us to compare, 'apples to apples', apparently, the case study company has a well satisfied workforce.

Regarding the various performance measures, starting first with the changes within the company, there are upward trends in all the reported performance indicators. In graph 4.2, starting in 1988, there has been a steady improvement in real sales (discounted for inflation). The return to financial health is reflected in the earnings per share found in graph 4.5 and the overall increase in operating profits in graph 4.6. However, it is likely that some of this increase in total sales can be attributed in part to an increase in stores, seen in graph 4.3, and the increase in sales per square metre seen in graph 4.4.

While changes in performance within the company have been increasing after the introduction of the AESOP, relative to other companies in the retail food industry, the company has also been performing very well. During the time period analysed, the case study company was the only company which offered an AESOP. Looking initially at the labour productivity measure of sales

[19] The questionnaire item for Brown and McIntosh's work is a five point scale with 'Strongly Agree' being 1 and 'Strongly Disagree' being 5.

per employee in graph 4.7, in 1993 the case study company was a distant fifth out of five.[20] By 1997 it was nearly tied for second place with the other three companies. Only one competitor clearly had a greater level of sales[21] per employee. Commencing in 1994, the firm starts an upward trend in sales per employee and the trend seems to accelerate in 1995. In graph 4.8, which displays operating profit per employee, compared with competitors in 1993, the case study company was again a distant fifth. An acceleration in operating profit started in 1994 and continued until 1997. The same story applies to profit margins and value added, seen in graph 4.9 and 4.10 respectively. The company moved from fifth place in 1993 to nearly a tie for second in 1997 for profit margins and made sizable increases in value added per employee over the same period.

Table 4.6 is the percentage change *within* the various companies and *between* the case study company and its competitors between 1994 and 1997 for sales per employee, operating profit per employee and value added per employee. The first column shows the 'first difference' or the change within the various companies between 1994 and 1997. The second column labelled 'difference between differences' is the change during these years between the case study company and the competitors. This exercise is an attempt to control for 'fixed effects', or any other factors which impact performance and are stable over time. Due to the small set of firms found in this analysis, testing for statistical significance is not possible, however, the table clearly shows the case study firm to be performing very well over these years in comparison to itself and relative to its competitors. Especially striking is the growth in value added per employee by 177 per cent

[20] The data was obtained through Datastream Data Services.

[21] It is necessary to note that if the company's stated objective of increasing the hours of employees and reducing total employment was realized this would have the effect of increasing the sales to employee ratio.

between 1994 and 1997 which is between 145 per cent and 157 per cent better than it's competitors.

The results concerning the changes associated with wages and employment levels are also of interest. In Table 4.7, of the five companies, the firm's basic rate is lower than two of the five competitors, approximately the same as the third (except the provincial rate) and clearly greater than one competitor. This is further supported in graph 4.13 which presents average annual earnings per employee. Annual earnings at the case study company is considerably less than its competitors. It appears that the case study company may be using the stock option programme in the way which Weitzman envisioned, as a way to keep 'fixed' compensation costs lower. From this type of analysis, we cannot say for certain, however, as shown in graph 4.11, there is an increase in the number of employees per store: this signals that a closer empirical look to evaluate Weitzman's theorized employment effects may be warranted.[22]

The next objectives include reducing employee turnover and promoting employee communication. Using the annual morale survey there is an attempt to detail some of the associations between these effects and the initiation of the share option programme at the case study company. There is a reduction in employee turnover between the years 1995 and 1997 (graph 4.12). Concerning the industrial relations outcome of the success of various communication programmes, (Q4; 88.3 per cent) of the employees believe they have the right to say something if they see something wrong. Also, (Q8; 33 per cent) of the workforce believe that management takes decisions which should be made at a lower level. Using the Brown and McIntosh survey data as a comparison, while not an identical question, 94 per cent replied either

[22] As previously mentioned, a number of the stores were recently renovated which may influence the employment level at the stores.

1 or 2 to the questionnaire item, 'I get along well with my supervisor'. If employees have a good relationship with their supervisor they may be more likely to say something if they see a problem.

4.6 Conclusion

From this analysis it is apparent that the case study company is doing many things right, including the initiation of a stock option programme for all employees and extensive communication programmes. The answer to the question regarding why a firm operating in the low-wage sector would invest in an employee option programme and in employee communication programmes, the company believes that there will be a positive impact on reducing turnover, increasing productivity and profitability. From theory there is evidence of contradictory dynamics. On the one hand, the company uses low-skill employees which argues against the use of contingent pay arrangements. However, it may be more difficult monitoring the customer service orientation of the workforce, which may be an argument for some component of remuneration being variable.

Regarding productivity and profitability, all of the fundamental performance indicators have increased. This upward trend in performance measures applies both to changes within the firm after the introduction of the AESOP, and in relation to its primary competitors which do not offer an AESOP. There is also a reduction in employee turnover, a high level of employee morale and participation and involvement in company wide communication programmes. Also interesting is that 86 per cent of the workforce at the company believe their actions affect the bottom line. There are mixed feelings from employees regarding the AESOP. While they appreciate the free

shares, they do not see how it affects their work behaviour. However, there seems to be a 'culture' which promotes customer orientation, taking responsibility and affiliation with the organisation. It is difficult to say if the AESOP is 'the' mechanism which promotes this, but it seems to be a contributing factor.

Chapter 4 clearly shows us that group incentives and employee involvement programmes are worth a close empirical look. In the next chapter, using more rigorous econometric techniques, I will examine the impact which performance related pay, including group incentives, have on establishment performance. Chapter 6 will than directly address the question, is it employee involvement, group incentives, or the combination of the two, which elicits the greatest performance outcomes?

Table 4.1

Employee Communication and Involvement Programmes

Occurring Daily	**Weekly**	**Monthly**	**Annually**
Suggestion Scheme	Suggestion Scheme	Suggestion Scheme	Suggestion Scheme
Huddles	Huddles	Huddles	Huddles
		Monthly Meeting	Monthly Meeting
		Colleague Circles	Colleague Circles
			'Were Listening Survey'

Table 4.2

Share Schemes

Save As You Earn	All Employee Stock Option Programme	Executive Stock Option Scheme
Tenure: 12 months.	**Tenure:** 12 months.	**Tenure:** Company determined.
Hours: Minimum of 14 hours per week.	**Hours:** Minimum of 15 hours per week.	**Hours:** Company determined.
Cash-out: 3 and 5 year contract.	**Cash-out:** 3 and 6 year contract.	**Cash-out:** 3 and 4 year contract.
Contribution Level: £5 to £250 per week.	**Contribution Level:** 25% of base salary.	**Contribution Level:** Up to 4 times salary.
Share Purchase Price: 80%of market price.	**Share Purchase Price:** Market price.	**Share Purchase Price:** Market price.
Taxation:	**Taxation:**	**Taxation:**
Income Tax: No income tax paid on shares.	**Income Tax:** No income tax when option exercised as long as value of shares is less than £30,000.	**Income Tax:** Same as AESOP.
Capital Gains: 1997-1998 limit on capital gains tax is £6,500.	**Capital Gains:** Same.	**Capital Gains:** Same.

Table 4.3

Impact of Accounting Practice of Stock Options on Company Reported Profits

	Company A	Company B
Revenue from sales	**100**	**100**
Labour costs charged to P&L	**80**	**100**
Profits to employees from exercise of options	**20**	**0**
Total income to employees	**100**	**100**
Increase in net worth	**0**	**0**
Profit shown in P&L	**20**	**0**
Overstatement of Profit	**20**	**0**
Source: Smithers & Co.	**Company A pays EEs in part with options, Co. B does not.**	

Table 4.4

Hypothetical Example of
Annual Earnings of Individual at AESOP Firm Compared to Non-AESOP Firm

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Firm 1 (Non-AESOP Firm) (3per cent annual base salary increase)		6240	6427	6620	6818	7023	7234	7450
Firm 2 (AESOP Firm) (2per cent annual base salary increase)		6240	6365	6492	6622	6754	6889	7027
AESOP Payment					780		1560	
TOTAL:	Firm 1	6240	6427	6620	6818	7023	7234	7450
	Firm 2	6240	6365	6492	7402	6754	6889	8587

Table 4.5

Results Associated with the Annual Morale Study for 1997

Per cent of EEs Agreeing or Disagreeing with Question.	Agree	Disagree
1. I enjoy working at this store.	88	5.9
3. I am encouraged to come up with new ideas in my job.	71.5	18.2
4. When I see something wrong I feel I have the right to mention it.	88.3	4.8
5. Customers are number one in this store.	94.8	2.9
6. I have a good understanding of the best way to serve customers.	95.4	1.6
7. The work I do impacts directly on the success of the store.	85.7	6.3
8. Managers take decisions that should be taken at a lower level.	33	36.6

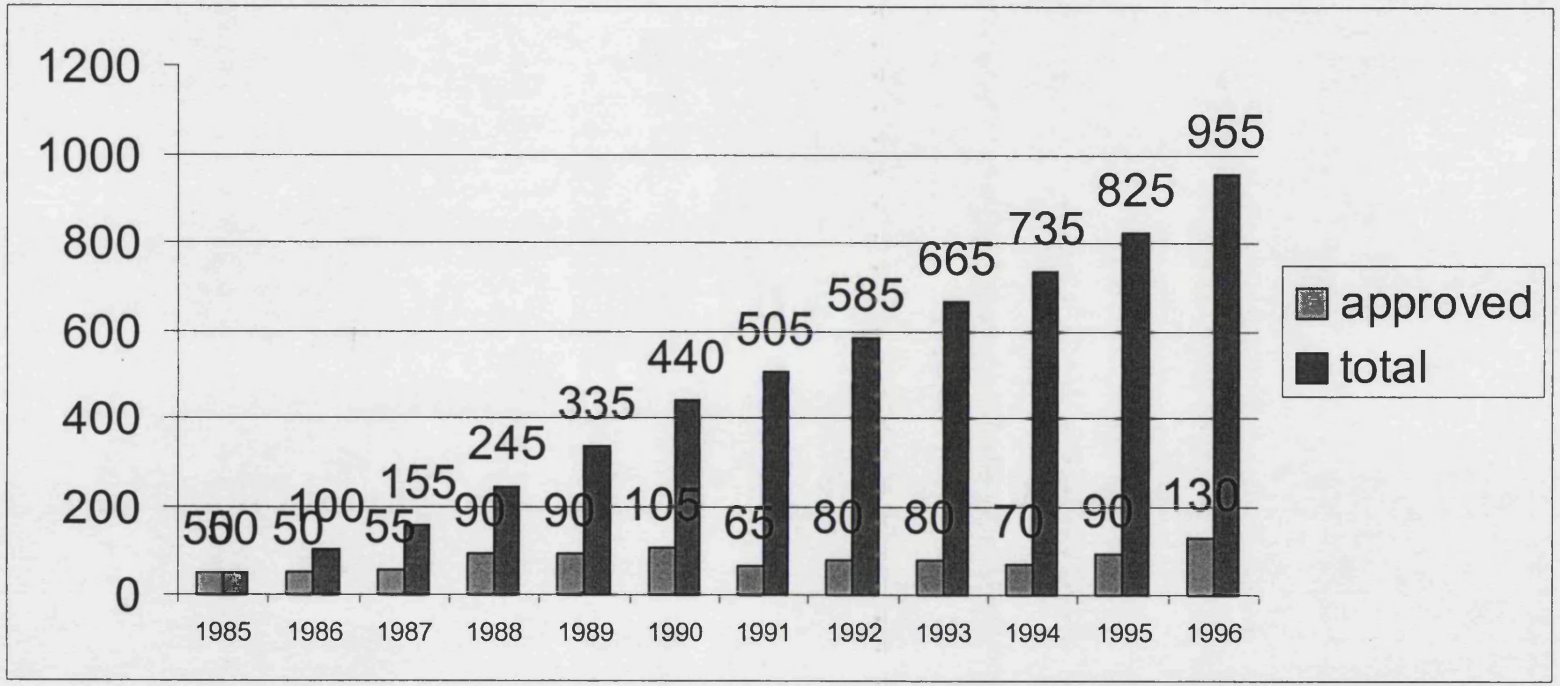
Table 4.6

Percentage Change Between 1994 & 1997

First Difference		Difference between Differences	
Sales per EE			
Case Co.:	**59%**	**Difference with:**	
Comp. 1:	17%	Comp. 1:	42%
Comp. 2:	39%	Comp. 2:	20%
Comp. 3:	16%	Comp. 3:	43%
Comp. 4:	20%	Comp. 4:	39%
Operating Profit per EE			
Case Co.:	**111%**	**Difference with:**	
Comp. 1:	36%	Comp. 1:	147%
Comp. 2:	50%	Comp. 2:	61%
Comp. 3:	-17%	Comp. 3:	128%
Comp. 4:	03%	Comp. 4:	108%
Value Added per EE			
Case Co.:	**177%**	**Difference with:**	
Comp. 2:	30%	Comp. 2:	147%
Comp. 3:	32%	Comp. 3:	145%
Comp. 4:	20%	Comp. 4:	157%

Graph 4.1

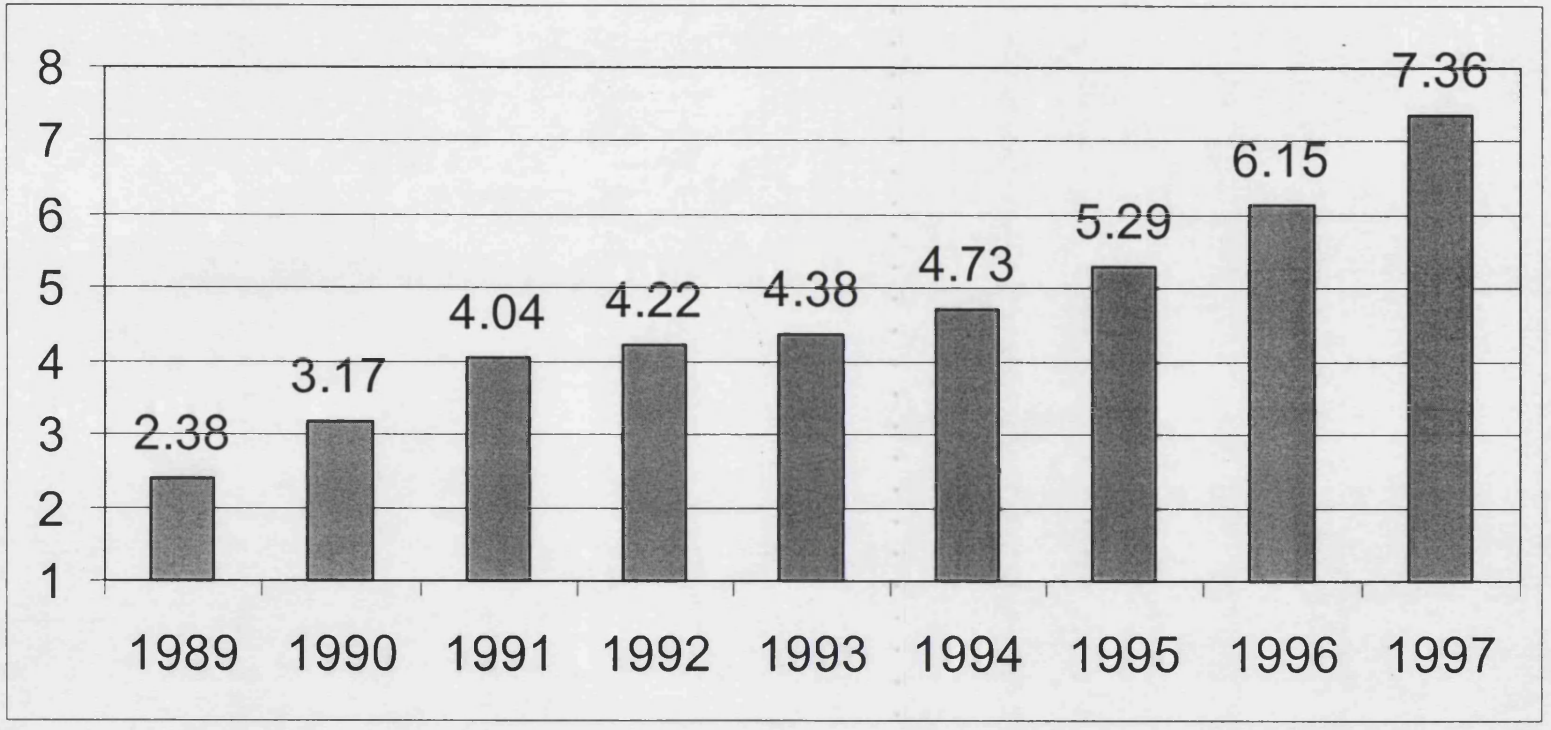
Discretionary Share Option Schemes Approved by Year



Source: **Internal Revenue Statistics 1997**

Graph 4.2

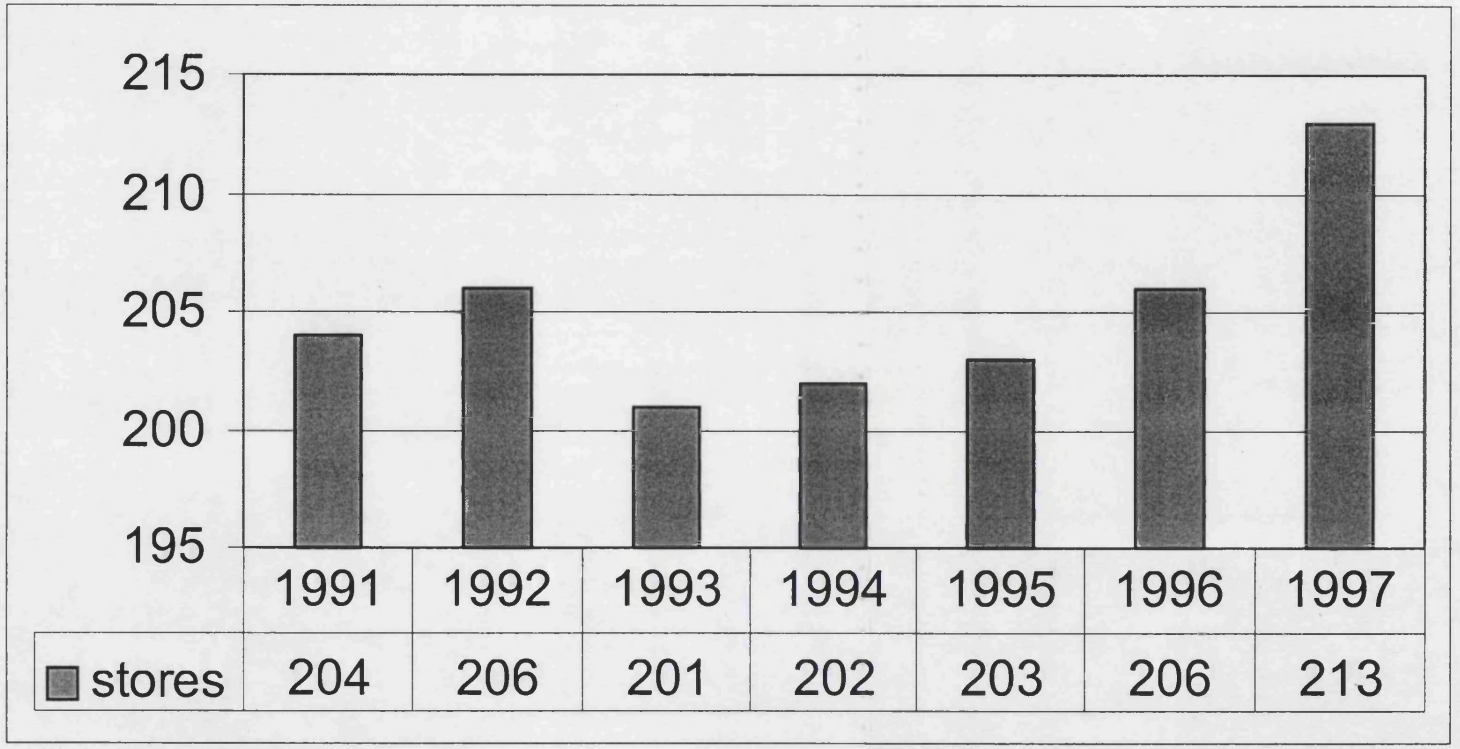
Annual Real Sales Turnover (1989 - 1997)



Source: Case Study Company Annual Reports **Scale: Billion Pounds**
(Deflated Using Retail Price Index: 1995 = 100)

Graph 4.3

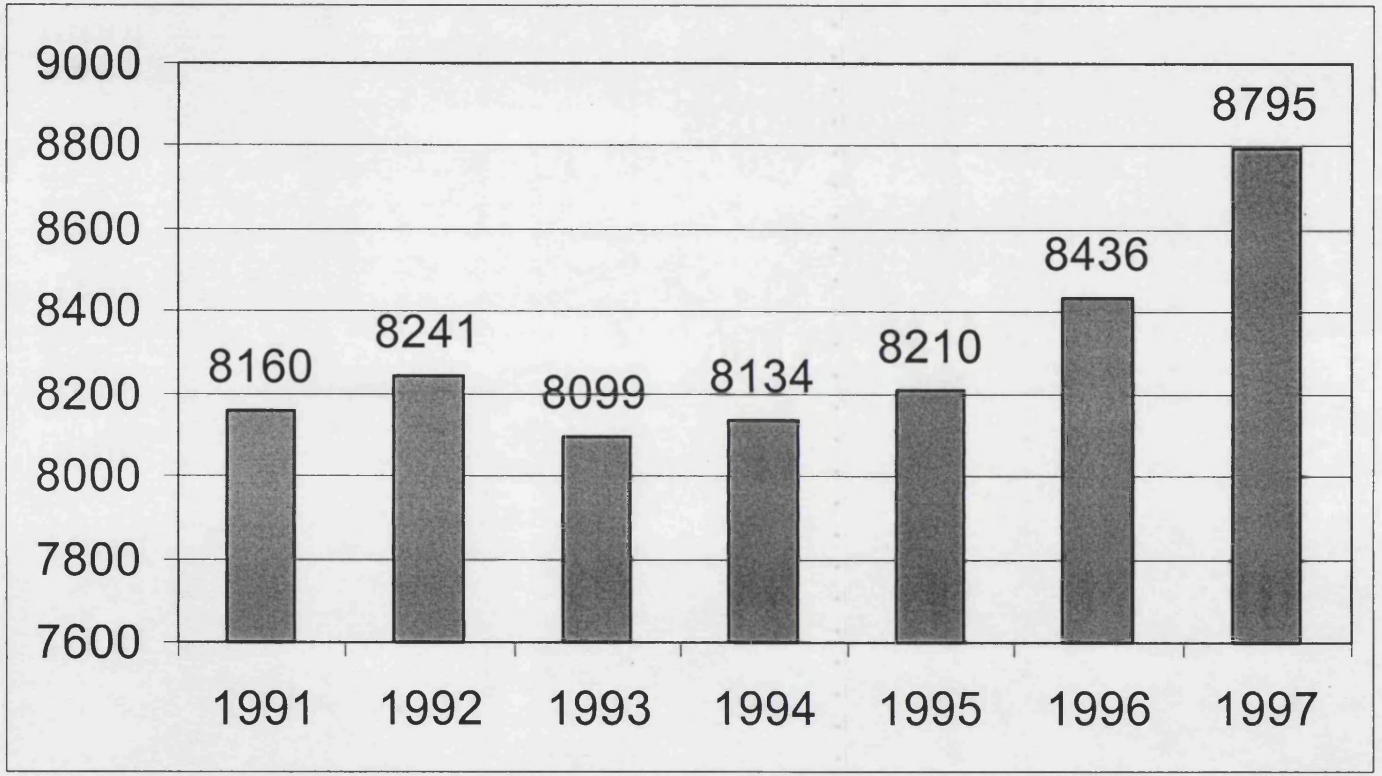
Total Number of Stores by Year



Source: **Case Study Company Annual Reports**

Graph 4.4

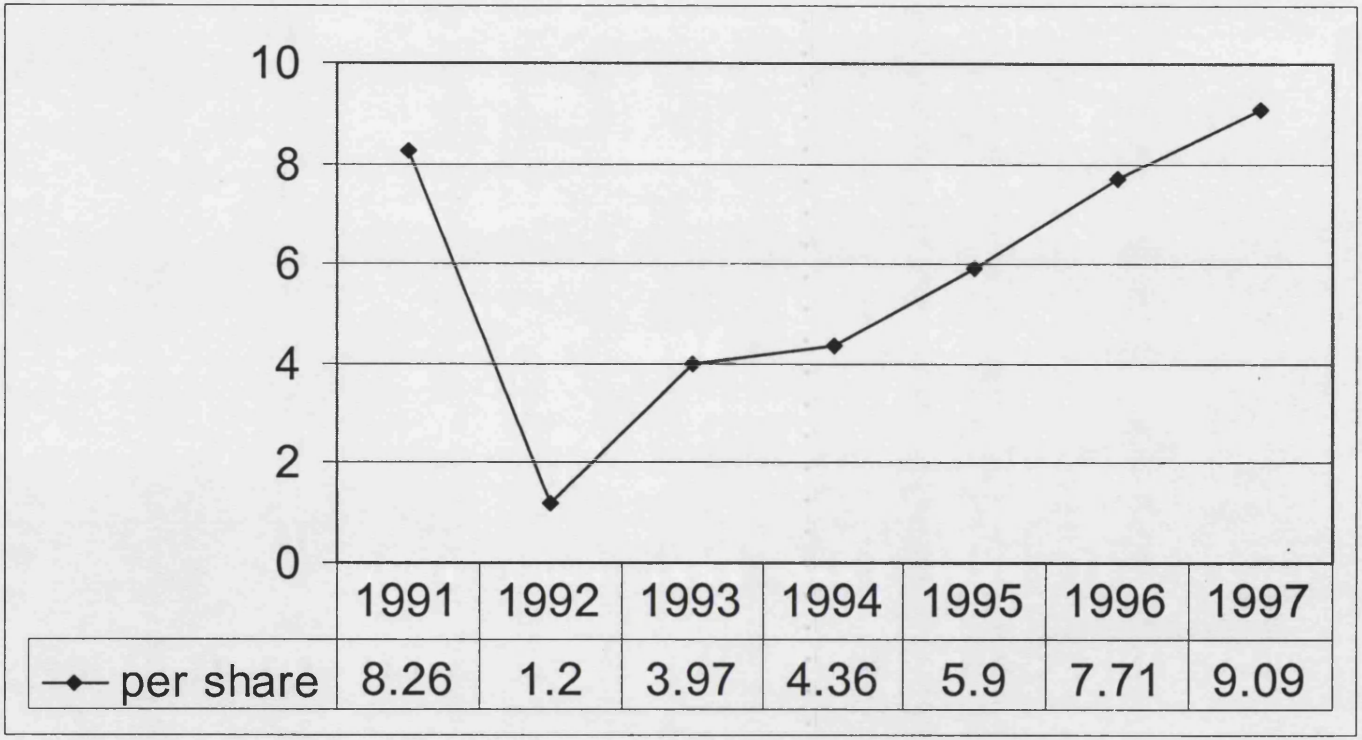
Total Sales Area



Source: **Case Study Company Annual Reports** **Scale: 000 Square Metres**

Graph 4.5

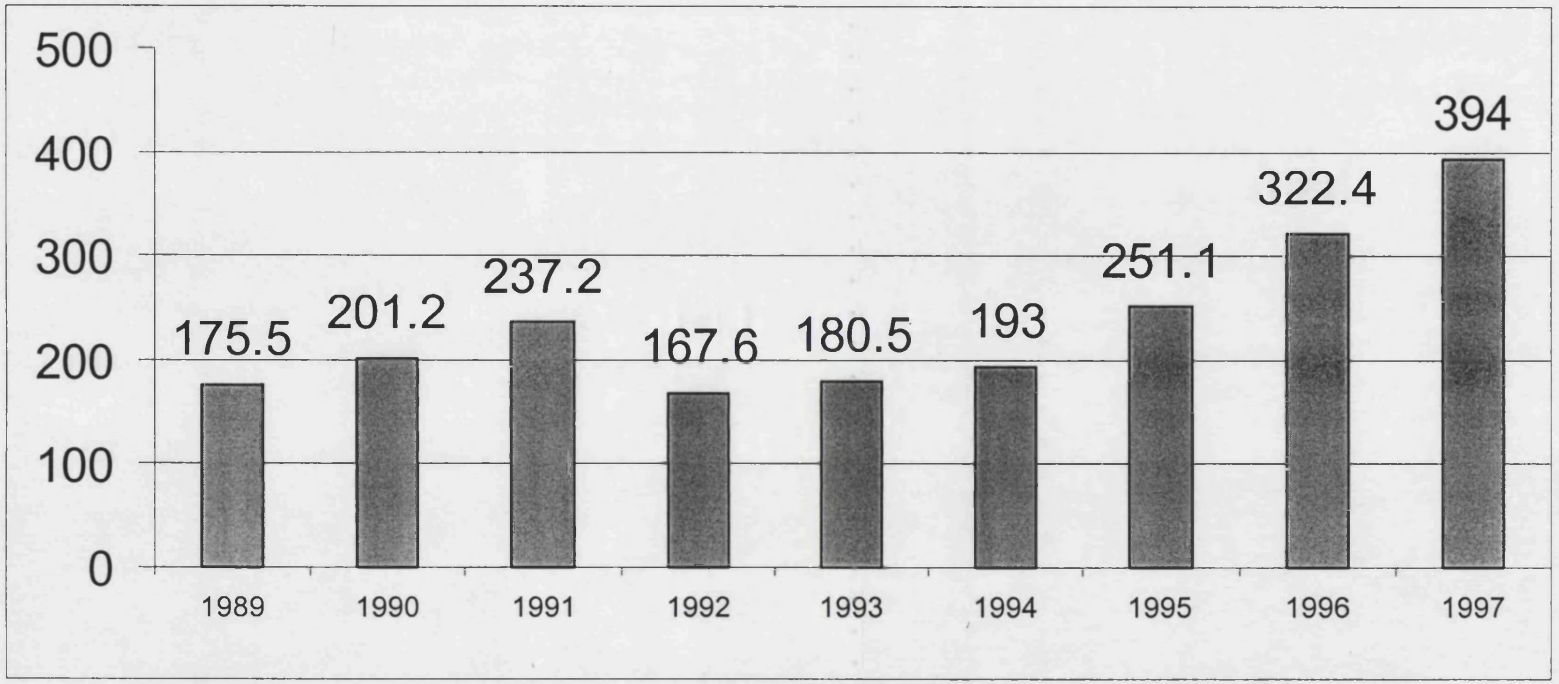
Earnings Per Share



Source: Case Company Annual Reports **Scale:** Pence

Graph 4.6

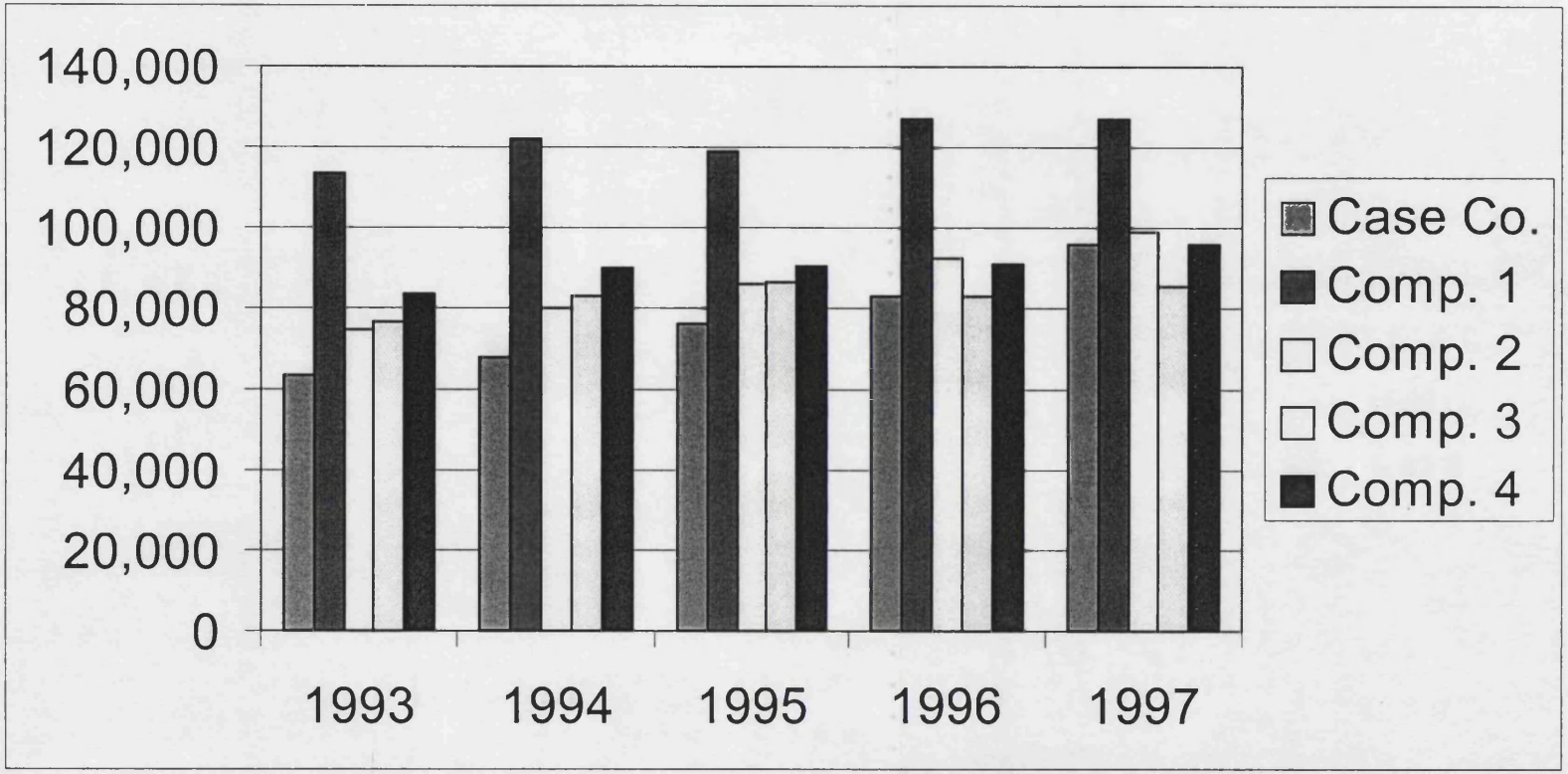
Operating Profit (1989 - 1997)



Source: Case Study Annual Reports **Scale: 000 Pounds**
(Index: 1995 = 100)

Graph 4.7

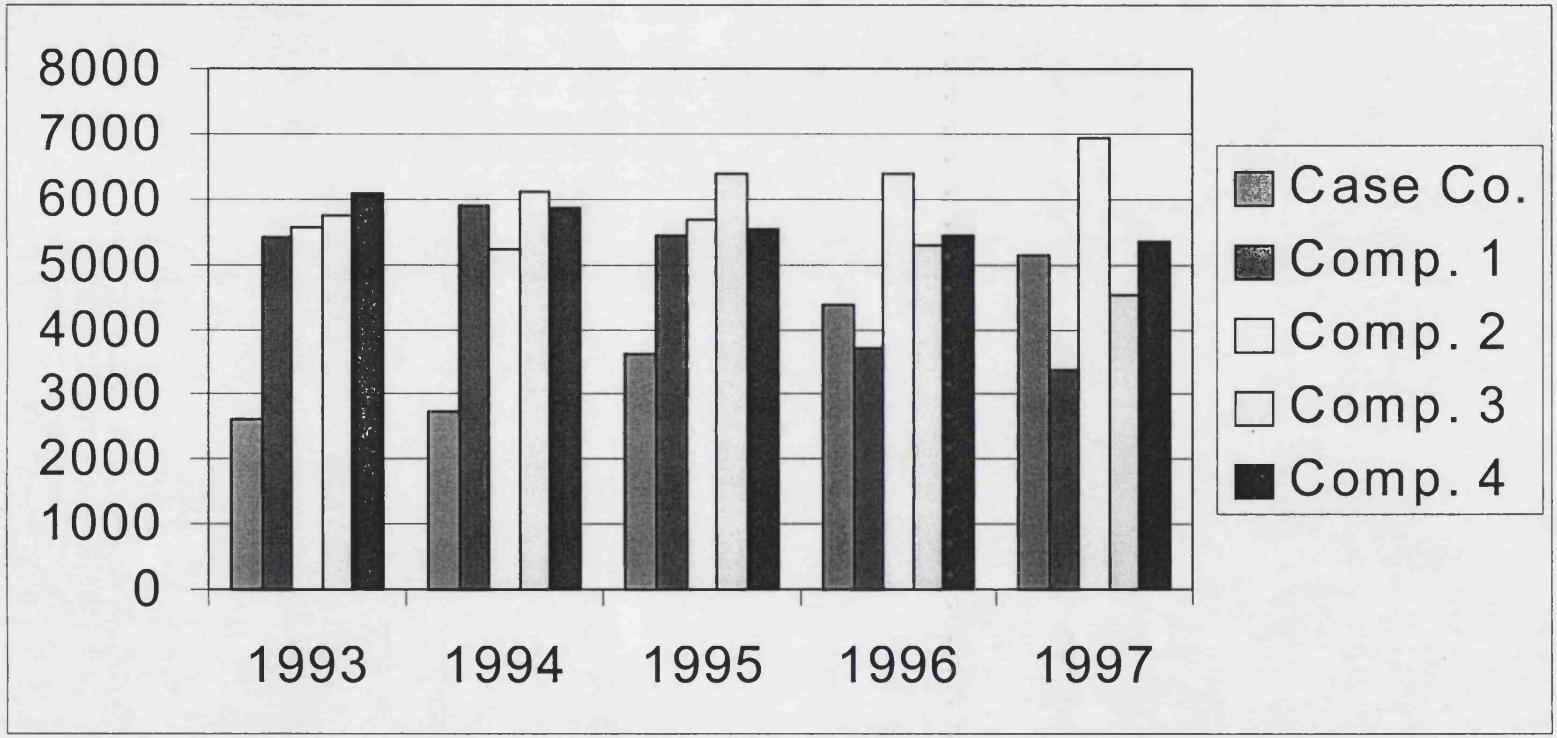
Sales per Employee (Full -Time Equivalent Employee - FTE)



Source: Datastream Online Company Accounts Data **Scale: Pounds (Index: 1995 = 100)**

Graph 4.8

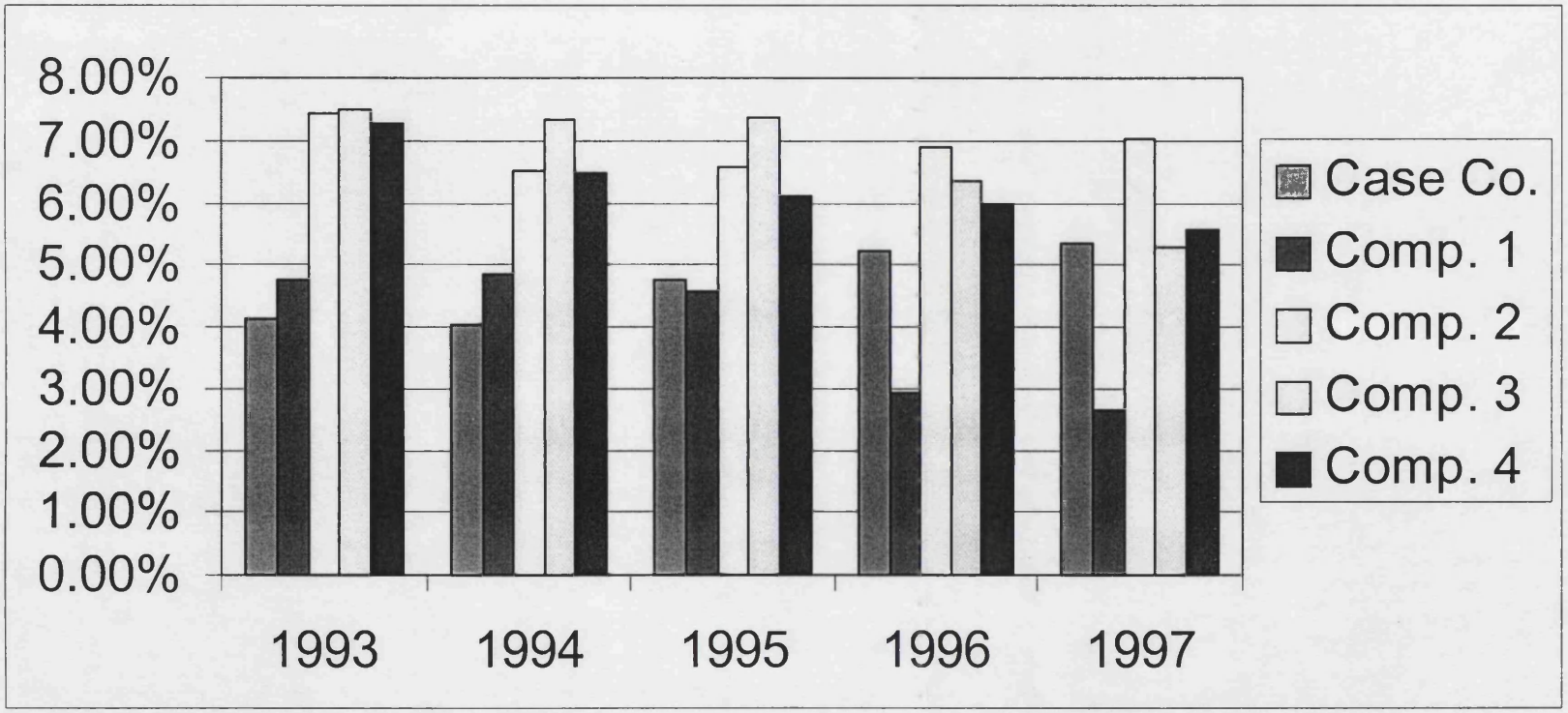
Operating Profit Per Employee (FTE)



Source: Datastream Online Company Accounts Data **Scale: Pounds**
(Index: 1995 = 100)

Graph 4.9

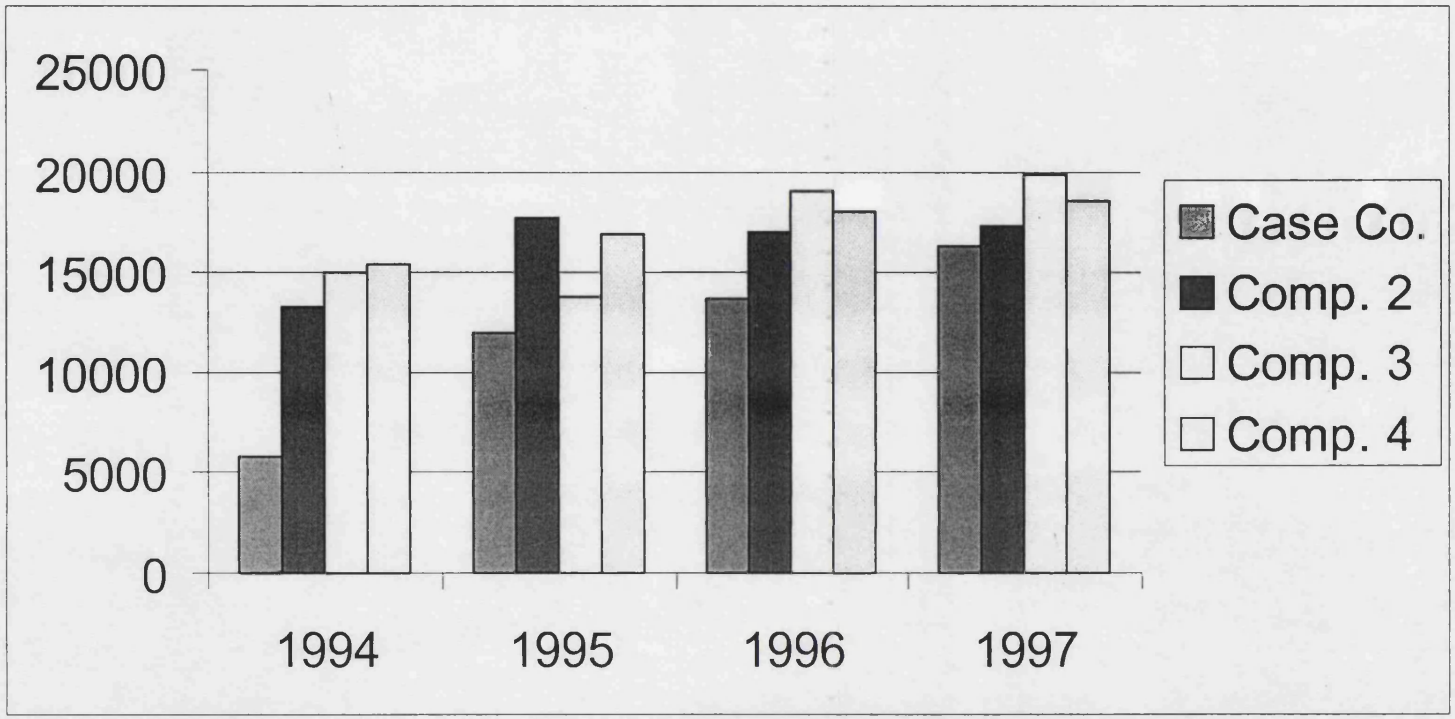
Profit Margins
(Profit/Sales)



Source: Datastream
(Index: 1995 = 100)

Graph 4.10

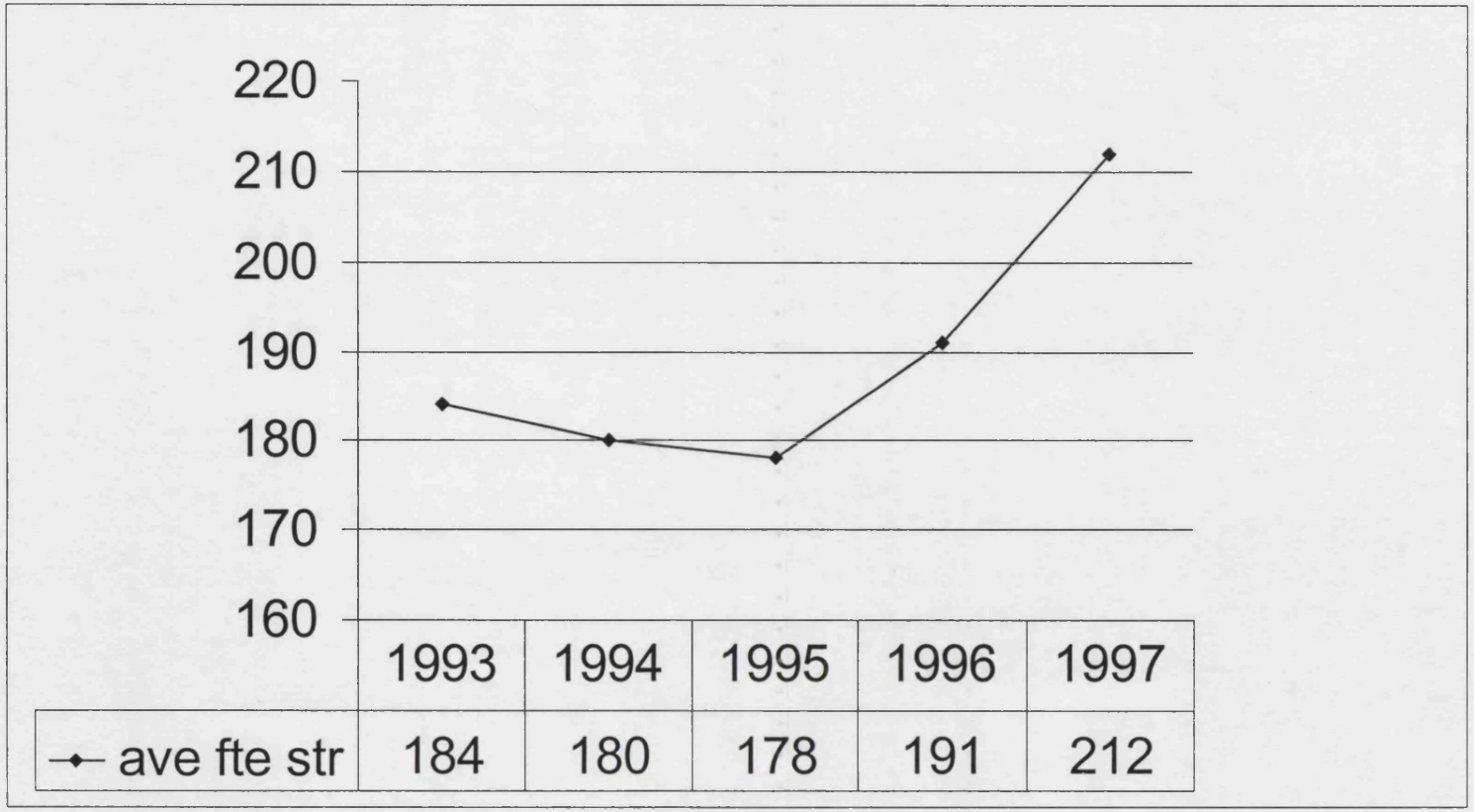
Value Added Per Employee



Source: Datastream Online Company Accounts Data **Scale: Pounds (Index: 1995 = 100)**

Graph 4.11

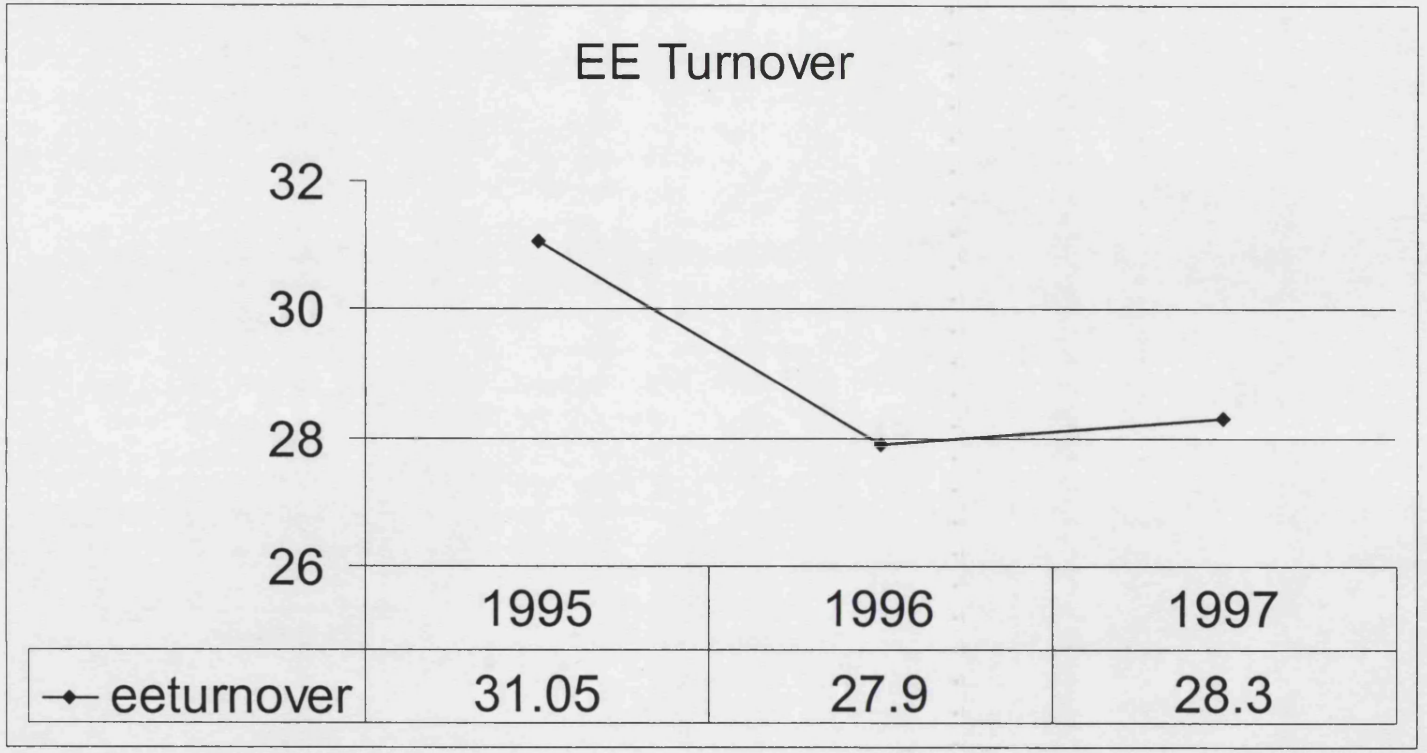
Average Number of Employees Per Store (FTE)



Source: Annual Reports

Graph 4.12

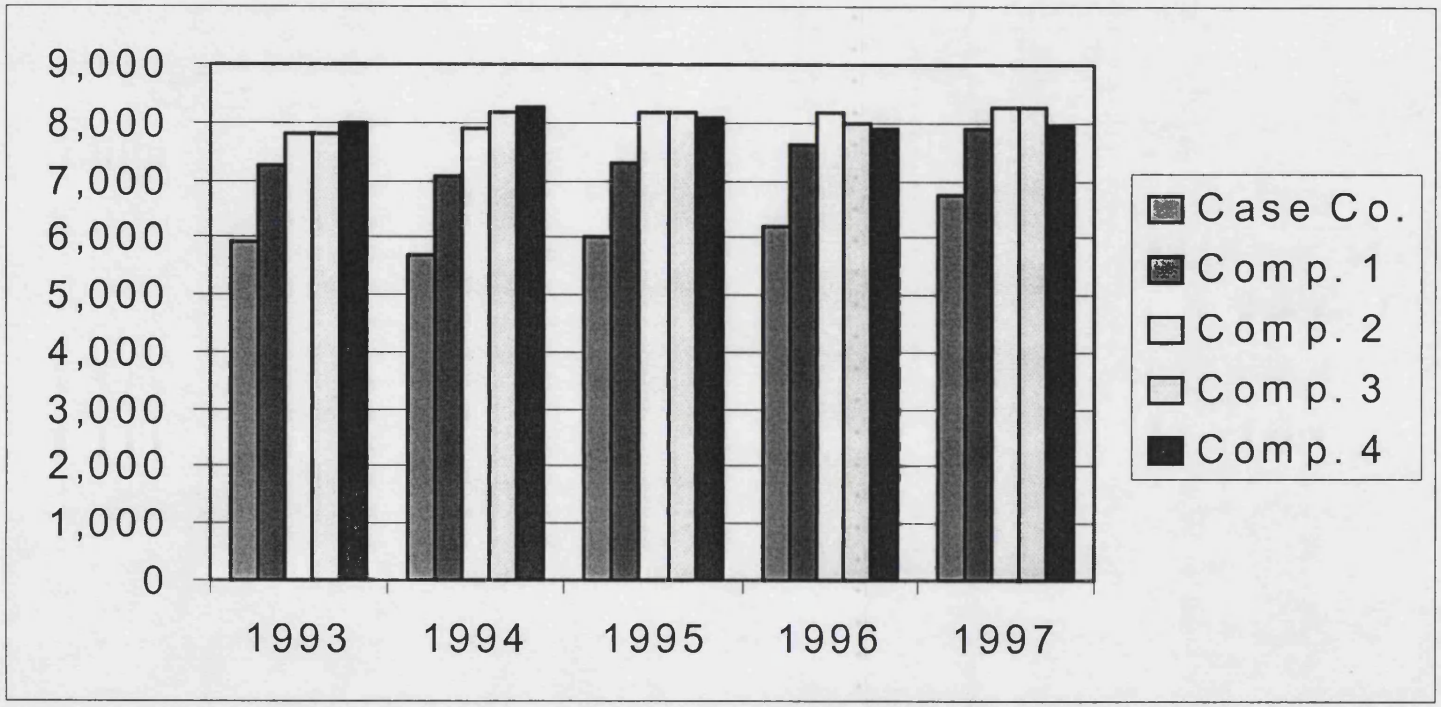
Percentage Annual Employee Turnover Between 1995 - 1997



Source: Case Study Company Annual Reports
(Calculation is based on quit-rate for FTE Employee over a 12 month period)

Graph 4.13

Average Annual Earnings Per Employee



Source: Datastream **Scale: Pounds**

(Based on Full - time Equivalent Employee)

Table 4.7

Pay Rate and Annual Profit-Related Pay for Hourly Employees in Select Competitors for 1997

	Comp. 1	Comp. 2	Comp. 3	Case Company	Comp. 4
Pay per Hour:					
London:	4.51	4.86	5.10	4.50	3.79
Outer London:	4.51	4.64	5.10	4.50	3.79
Provincial:	4.12	4.16	4.56	3.59	3.70
Pay Settlements:	2.5%	3.5%	3.5%	3.5%	3.0%
Contingent Pay:	Profit-Sharing	Profit-Sharing	Profit-Sharing	All Employee Stock Options	Co. Bonus
		All Employee Stock Options (Started in Oct. 1997)			
	SAYE	SAYE	SAYE	SAYE	

Source: Income Data Services Report 745.

Chapter 5

Fixed, Individual, Team and Group Pay in Team Production Settings

5.1 Introduction

A fundamental question faced by firms when designing their remuneration strategy is, which type of remuneration plan best promotes organisational efficiency? There are numerous forms of both fixed and variable forms of pay. Fixed forms include straight hourly pay or salary pay. Variable pay systems may include piece rate, merit pay, individual bonuses, team bonuses or group incentives such as profit-sharing or share schemes. The key question addressed in this chapter is, in a team production setting, where work areas are interdependent on the other, what is more efficient - to pay only a flat rate or to pay a flat rate plus some variable component, such as team based pay, individual bonuses or group-based pay such as profit-sharing? Also, of these various forms of variable pay which one is the most efficient?

Much of the manufacturing sector has undergone production changes from hierarchical specialized production control to decentralized control and much more flexible operations (Piore, 1989). This change in the production processes in the US and Western Europe may be modelled on the manufacturing processes in Japan (Aoki, 1988). The Japanese manufacturing process is characterized by 'Just-in-Time' manufacturing which allows for a quick adaptation to changes in market demands or the production of diverse products. According to Piore, the changes in the manufacturing process have resulted in a change from largely independent, 'autonomous' work areas, to workplaces where there is substantial interaction and interdependence between work

areas.

While evidence exists that performance-related pay produces better performance outcomes in individual economic activity, there is less evidence regarding which incentive contracts produce better performance outcomes in team production settings where the outcome is the result of group effort. Regarding the use of performance-related pay in individual production settings, recent work by Fernie and Metcalf (1995) on the horse racing industry examines the incentive effects of non-contingent retainers and performance-related pay for jockeys. They found that better performance was more associated with performance-related pay systems than with non-contingent retainers. Earlier work by Ehrenberg and Bognanno (1990) examining the 1984 European Men's GPA tournament found similar results. While these works support the theoretical notion that pay based on performance has a greater incentive effect than pay based on some observable behaviour, such as time on the job, their work does not address the question of the optimal compensation outcomes in a team production setting.

The Corporate Performance data-set gives detailed information on the type and form of remuneration programme at the shopfloor worker level. There are advantages associated with examining the impact of various remuneration programmes for this group of employees because at this level there may be the potential for having a substantial association with the performance of the organisation. Shopfloor workers are in direct contact with the production process so they may be more likely to have an impact on performance. The sample of establishments surveyed are primarily team production settings where the final product is interdependent on other

production areas.[1]

Using two measures of establishment financial performance, the impact fixed and various variable pay forms including: individual level bonuses, team bonuses, merit pay and group pay, are evaluated to determine the impact they have on establishment performance in team production settings. A restricted sample of establishments which have only a high degree of interdependent work areas is examined in order to determine if there is any difference in the impact of compensation practices on these establishments.

5.2 Theoretical and Empirical Overview

Theoretical Overview - Individual Incentive Effects

According to Lazear (1995), in order to provide optimal incentives two factors need to be taken into consideration when choosing how to pay people. Firstly, the remuneration programme must attract the right type of worker, and secondly, it must create the right incentive so the worker puts forth maximum effort. Lazear derives the most efficient remuneration scheme for risk neutral workers which consists of making them full residual claimants. This would entail having workers pay rent for their jobs and being entitled to all the profits associated with their work. However, there is a fundamental problem with making workers fully entitled to residual profits because it is thought that workers are risk averse. This may especially be the case in situations where workers do not have control over all the factors which have an impact on performance.

[1] 96 per cent of the establishments have some degree of interdependence, 75 per cent have a moderate to high degree of interdependence. An example of interdependent work areas would be represented by the 'Toyota Production System', as depicted by Levine (1994) in his case study of the GM - Toyota joint venture plant, NUMMI. These workplaces are characterized by having 'Just-in-Time' production inventory, Total Quality Management programmes, worker control over the production process.

Additionally, time-based pay is a pay system based on input rather than output, so there may be occasions when measurement costs are so high that paying basis input (e.g. time) may be more efficient. There are, however, problems with paying time- or a rate-based on input, rather than output. Remuneration programmes which cater to risk aversion are prone to moral hazard. Moral hazard being the tendency for an individual to shirk their duties in so far as monitoring will allow. In making a choice regarding which compensation programme to use firms need to strike a balance between catering to the risk level of the employees and attempting to control the incentive diluting effects of the moral hazard problem. Additionally, an issue associated with remuneration programmes which cater to worker's risk aversion is the sorting issue.

Another reason performance-based remuneration is thought to elicit superior establishment performance outcomes, rather than non performance-based remuneration programmes, is that higher ability workers may sort to firms and occupations where pay is based on performance. In sorting to firms which offer remuneration which is placed at risk, their higher ability levels may be rewarded. If higher ability workers do sort to firms where performance is rewarded the inverse may also apply and less able workers may sort to firms where remuneration is not placed at risk. While it may be true that these lesser able workers will be paid less, and there will be savings associated with a reduced wage bill, there may also be reduced output and poorer product quality. Consequently, according to Lazear (1995), it is difficult to see how remuneration strategies that incorporate insurance qualities constitute an optimal incentive scheme.

Additionally, firms which offer pay based on performance may have higher levels of output because of the increased effort workers put forth due to the motivation effects associated with incentives. This dynamic is largely explained in the psychological literature in expectancy theory.

Expectancy theory would predict that as productivity-enhancing behaviours are reinforced, these behaviours should be observed more frequently (Locke and Latham, 1990). According to Becker and Hueslid (1996) the advantage this has is that the firm is in the position of dictating the behaviours which it sees as being important. This has the effect of assisting to resolve a fundamental issue within economic organisation, the principal-agent problem. The principal-agent problem occurs when the principal or the owner's objectives are at odds with that of the agent's or the non-owner employee. In order to bring the interests of the agent in line with those of the principal, the principal needs to develop incentive contracts which align the best interests of the principal with those of the agent. In addition to agency theory and the corresponding mechanism found within expectancy theory there is the additional argument put forth by efficiency wage theory which suggests there are efficiency effects associated with paying a higher than market rate. Higher wages will attract higher quality workers and will reduce turnover of higher ability or skilled workers due to the fact that they will not receive this wage premium in alternative employment and thus be loath to lose the higher paying job (Levine, 1993; Pfeffer, 1994).

Theoretical Overview - Team Incentive Effects

What, however, does theory have to say about possible outcomes in team production settings? Work by Kochan, Katz and Mckersie (1986) suggests that in production settings where teamwork is important, group incentives are important because they may promote co-operative behaviours which are fundamental for efficiency in team settings. Theoretical work by Drago and Turnball (1988) examines individual versus group piece rates in team technologies. They determine that in team settings individual piece rates may promote inefficient under-co-operation, while group piece rates may cause inefficient over-co-operation. Drago and Turnball contend that the success

of group incentives in team settings is dependent on the success of an establishment or firm in eliminating or reducing the effect of the free-rider problem. As long as firms can develop a culture which promotes 'inter-worker co-operation', 'trust' between workers, and where workers reciprocate assistance or share information, group-based incentives may promote greater performance or output.

Another reason group-based pay may be more efficient in team settings is because monitoring costs may increase where this form of production process is used. A high level of interdependence in the production process requires the workforce to be very adaptable and multi-skilled (Piore, 1989). Monitoring costs may be high in situations where private or asymmetric information exists (Milgrom and Roberts, 1992) so it may be more efficient for managers to look for substitutes to formal monitors, which group incentive schemes may provide (Wietzman, 1995). Piore and Sable (1984) suggest that the new skill mix associated with new technologies increases monitoring difficulties, which, in turn, may make group incentives efficient. This is supported by Drago and Heywood (1995) who found profit-sharing to be more likely where monitoring was more difficult.

Empirical Overview

While there has been research into many of the various forms of variable remuneration including piece rates (Lincoln, 1945; Shearer, 1996), merit pay (Wood, 1997), team pay (Thompson, 1995), profit-sharing (Weitzman and Kruse, 1990), and share ownership (Blasi, Conte and Kruse, 1996), there have been few studies which examine a broad range of remuneration practices and also identify the production process. The research which closest matches the work here is the study undertaken by Mitchell, Lewin and Lawler (1990), however, they do not specify what type of

production process is present in the settings they examine. In addition to a historical and theoretical overview of the types and forms of variable pay systems, they also conduct an empirical analysis of a variety of pay systems. Using an establishment level data-set which contains detailed information on human resource practices, including remuneration programmes and establishment outcomes, they evaluate the impact of the various remuneration programmes on performance. They concentrate on two groups of employees, including production and clerical workers. In their study three measures of performance are used including return on investment (ROI), return on assets (ROA), and a productivity measure of net sales per employee (PROD). These performance measures are evaluated using both cross-sectional analysis and also growth trend analysis between the years 1983 - 1986. Examined is the impact of profit-sharing, gain-sharing, stock option plans, employee stock ownership plans and team production bonuses. The results of this analysis show there to be a strong positive statistically significant association for all the performance measures and the growth trend for profit-sharing and share ownership in both clerical and production employees. The cross-sectional results show the same positive association between profit-sharing and both clerical and production workers for all the performance measures. While the coefficients were positive for stock ownership the only one which was statistically significant was productivity for production workers.

5.3 Data and Test Variable Measurement

5.3.1 Data-Set and Establishment Characteristics

Corporate Performance Project

The Corporate Performance Project is a longitudinal research project being carried out jointly by

the Centre for Economic Performance at the London School of Economics and the Institute of Work Psychology at the University of Sheffield. One of the principal aims of the project is to research how management practices impact upon the performance of establishments. The project obtains information from manufacturing establishments located in the United Kingdom. The data was gathered using on-site structured interviews with the establishment's human resource manager, plant manager, or other production manager. The financial data was collected from company reports contained at company house or directly from the establishments. There was a 5 per cent participation rate of those who were contacted. This low participation rate was largely due to the detail of information required for the research project. The project started in 1990 and will be completed in the year 2000. Currently two periods of data are available. The first period of data collection was conducted between 1992 and 1994. The second period of collection was between 1994 and 1996. The database contains information on 118 establishments gathered during the first period, 1992 through 1994. The second period of data available for the time period 1995 and 1996 contains information on 60 establishments. Forty-five of the establishments interviewed in the first round of interviews and in the second round, 15 new establishments were interviewed.

The data-set contains very detailed information on the types of management practices, the structure of the establishment, the market they operate in, work practices and organisational designs, establishment performance outcomes and human resource policies and practices. Establishment performance outcomes include sales turnover and profitability. The questionnaire was designed by both economists and organisational psychologists so measures of the management practices are included as are establishment performance indicators. Also included in the data-set is information on product market, technological sophistication and management

practices which may influence outcomes.

Establishment Characteristics

The establishments have between 60 and 1,929 employees, with an average of 238 employees per establishment. Total turnovers in the establishments are between £15,000 and £250 million with an average of £18.6 million and a standard deviation of £3.3 million. Relative to other establishments in the manufacturing sector these establishments would be considered small to medium sized. Seventy per cent of the establishments are owned by a parent or holding company, 37 per cent are Plc and 63 per cent are Ltd. Seventy nine per cent of the establishments do not share facilities with the parent company or share facilities to only a small degree. The establishments are UK manufacturing establishments in the following sectors: engineering, 45 per cent; electronics, 9 per cent; plastics, 24 per cent; food & drink, 7 per cent; Misc. 15 per cent.

Production Technology and Work Design

The workforce uses a fairly high level of workplace technology. In 59 of the 118 establishments shopfloor workers used either computer numerical control (CNC), computer aided design (CAD) or computer aided engineering (CAE) 'to a very great extent'. Also, 54 per cent of these establishments are associated with firms which have a research and development department. One feature that stands out in this set of manufacturing establishments is that in the production process, 75 per cent of the establishments have a moderate to high degree of 'interdependent' production processes, where each area is dependent on the others in order to complete their work. Twenty-four per cent of the establishments have also adopted a 'Just-in-Time' production procedure.

Work Practice Characteristics

Team work is used in 84 per cent of the establishments. Seventy-two per cent of the establishments use extensive use of job rotation, and 57 per cent use an extensive amount of variety on the job. Ninety-one per cent of the establishments have formalized quality programmes and 65 per cent use quality improvement teams. In the majority of establishments there is a movement towards having a much more decentralized, leaner organisation. Eighty-five per cent of the establishments report that there has been a recent change regarding decentralized decision-making. In 56 per cent of the establishments the management of materials and components are becoming decentralized to work stations/groups. Eighty two per cent of those interviewed said they felt there had been significant changes in the establishment over the past two years. Of those establishments which underwent some changes, 78 per cent thought the changes resulted in a flatter organisation. Seventy-eight per cent also thought workers had increased responsibilities, 75 per cent believed there to be an increased level of employee participation from lower levels.

5.3.2 Shopfloor Remuneration Programmes and 'Interdependent' Work Areas

The measures used for establishment remuneration programmes are the questionnaire items found in exhibit 5.1 located in the appendix. Table 5.1 is a listing of the various forms of pay which are examined in this chapter. The two 'fixed' pay elements include standard hourly pay and a 'salary' element. While paying shopfloor workers a salary is becoming increasingly common there is often a provision that they receive overtime pay if they work more than contracted hours. Piece rates consist of being paid per item produced. Irrespective of some very well publicised plans,[2]

[2] Referring to the well-documented Lincoln Electric piece rate pay plan.

piece rate systems are on the decline in the manufacturing sector. Individual bonus and individual merit pay systems are more common in non-integrated production settings and occupations where the final product or service is easily identified with the individual responsible. While individual performance is normally evaluated, in a team production setting the emphasis is normally placed on the output of the team or the group. Team-based pay has recently drawn considerable attention as have group compensation practices such as profit-sharing, gain-sharing and share ownership. The data-set clearly identifies team-based compensation and both profit-sharing and company bonuses.

The questionnaire asks to identify whether the establishment pays either profit-sharing, company bonus or both. In the UK there is the possibility of considerable tax advantages associated with profit-sharing. While we cannot tell for certain if an establishment profit-sharing plan is used to take advantage of the tax breaks, if they have one in place it is most likely set-up to take advantage of tax breaks. While the questionnaire also asks if there are any other forms of incentive systems in place in the establishment, the replies include such a broad range of both pecuniary and non-pecuniary incentive devices that it is impossible to offer much comment on this variable.

Regarding determining if an establishment has a high degree of 'interdependent' work areas,[3] question 6, (ii) under the Production Technology section of the survey was used to determine the degree of interdependence. The establishment was determined to have a high degree of interdependence in its work practices if the question was answered with either, 'Quite a lot' or 'A

[3] The variable definition (links2) can be found in table 5.4 and descriptive statistics in table 5.5. The questionnaire item used can be found in the appendix 5.1 exhibit 5.2.

great deal'.

Table 5.1

Pay System Descriptions

Pay System	Description
Hourly Pay:	**Pay fixed at a hourly rate.**
Salary:	**Annual payment. Often for shopfloor workers there is an overtime provision.**
Piece Rate:	**Pay system tied to measure day's output.**
Individual Bonus Pay:	**Bonus tied to individual performance criteria.**
Merit Pay:	**Individual pay based on individual merit.**
Team-Based Bonus:	**Bonus tied to team performance criteria.**
Profit-Sharing:	**Accounting-based profit-sharing scheme.**
Company Bonus:	**Accounting-based company wide bonus.**
Other Incentives:	**Includes a broad range of both pecuniary and non-pecuniary incentives. Includes incentives such as stock options, free gifts, time off, and other group or individual based incentives.**

Table 5.2 is the frequency with which the establishments use the various forms of pay systems. From this table it is apparent that most establishments pay a 'flat-time' rate. There are only a few (6 per cent) establishments which pay shopfloor workers from measured output traditionally known as piece rates. However, there are a number of establishments which are paying their shopfloor workers a salary (21 per cent). This type of compensation is relatively new to manufacturing establishments and is often used in situations where monitoring costs are high. As we would expect, the majority of establishments continue to pay a flat-time rate (73 per cent). These three taken together represent the establishment's 'basic' pay element and when added together total 100 per cent of the establishments.

In addition to these basic pay components many of these establishments also pay a contingent element. As mentioned, most of the establishments surveyed have a production process in which the various work areas are dependent on one another for the final product. In these types of settings we would expect to see a greater degree of team- or group-based incentive schemes than individual-based contingent pay. This is what does occur in practice. Only 9 per cent of the establishments offer individual level bonuses. There is a higher level of merit pay at 13 per cent, and while this may mostly be associated with individual performance, it is impossible to say this for certain because the survey does not specify whether merit pay applies to individual, team or group performance. Many of the establishments pay either a team-based bonus (11 per cent), profit-sharing (22 per cent) or a company-wide bonus (2 per cent). Additionally, a full 27 per cent use some other form of incentives. As already discussed, while this is interesting, we have no way of knowing which establishment uses what form of incentive pay.

Table 5.2

Frequency of Remuneration Type for Shopfloor Workers in Establishments

Compensation Type	Percent - Yes
Flat-Time	73
Bonus - Ind. Base	09
Bonus -Team Base	11
Merit Pay	13
Piece Rate	06
Profit-Sharing	22
Company Bonus	22
Salary	21
Other Incentives	27

Table 5.3 is the correlation between the various remuneration programmes. There is a strong negative correlation between salary and flat-time rates. A firm would not pay both a flat rate and a salary. However, a firm may pay either a flat rate or a salary and some combination of contingent pay. There is a negative correlation between all other forms of remuneration, except merit pay and flat-time payments. The same largely holds true for those paid a salary. While there is a negative relationship between 'fixed' forms of pay, and the other contingent pay arrangements, this does not mean there are no firms which offer a 'fixed' pay element coupled with one or more contingent elements.

Table 5.3

Correlation Matrix of Remuneration Programmes

	Flat	Own	Team	Merit	Pay	Pfsh	CoBn	Sal	Inct
Flat	1.00								
Own	-.24	1.00							
Team	.00	.04	1.00						
Merit	.10	.07	-.12	1.00					
Pay	-.04	.10	.08	.04	1.00				
Pfsh	-.13	-.16	-.09	.08	-.03	1.00			
CoBn	-.24	-.04	-.11	.15	-.05	.09	1.00		
Sal	-.59	-.14	.02	-.15	-.12	.04	.17	1.00	
Inct	-.27	-.16	-.01	.00	-.03	.22	.09	.18	1.00

(n = 168)

All correlations = > .10 are significant at the .10 level, those > =.13 at the .05 level, those = > .17 at the .01 level, those = >.23 at the .0001level.

Flat=Hourly Pay **Team=Team Bonus** **Inct=Other Incentives**

Pay=Piece Rate **Own=Individual Bonus** **Merit=Merit Pay**

CoBn=Company Bonus **Pfsh=Profit-Sharing** **Sal=Paid a Salary**

5.3.3 Remuneration Variable Definition

For the purposes of this evaluation, an evaluation of fixed and variable pay systems, salary or an hourly base rate are considered fixed pay. Consequently, I have identified those establishments which pay either a straight hourly rate and those which pay a salary. I have then isolated the establishments which pay a salary or only an hourly rate and have separated these from establishments which pay some form of variable pay including any combination of individual, team, merit, company bonus, profit-share or another form of incentive programme.

The second category includes establishments which pay either a salary or an hourly rate and any of the contingent pay options. While this is a broad category, and it would be possible to build a rational associated with the incentive and effort effects of the differing contingent pay options, for example, the varying incentive effect of individual versus team remuneration programmes, the size of the data-set does not allow me to disaggregate to this level. I am, however, able to break down the remuneration programme by whether or not the establishment pays a company profit-sharing or a company bonus.

5.3.4 Dependent Variables

Two financial measures and one measure of labour productivity are used to determine the impact the variables of interest and control variables have on establishment performance. Establishment performance measures include ROS and ROA. ROS is defined as profit before tax divided by total establishment sales. ROA is defined as profit before tax divided by assets. Labour productivity is measured as the natural logarithm of total sales adjusted for inflation and

normalized by the number of employees.

The measure of profits before tax is: sales revenue minus cost of sales (materials, wages & salaries, depreciation, rent, interest payments, any exceptional/extraordinary costs (e.g. reorganisation costs)). In order to standardise total sales, profits and assets they have been deflated to base year 1990 using a deflator taken from the International Monetary Fund International Financial Statistics CD-Rom for UK manufacturing in 1997. Total sales profits and assets were deflated at the 2-digit level.

In examining the control and independent variables there is no variation in the pay practices between these two periods. The fact that there is no change in these practices disallows for first difference or change over time analysis in the panel data-set of 45. Given that there is no change in the practices during the two periods, it is possible to extend the data-set to include information on the presence of the control and independent variables in future years. That is, if the remuneration practice was in place during the first round of interviews in 1993 and was also in place in the second round of interviews in, say, 1995, I presume the practices were not discontinued and restarted during the one year in between, therefore, there is information on 1993 through 1995 for that establishment. Given that in 45 of the 118 establishments there was no change in these practices, I also assume that the same holds true for the other establishments and hold constant the status of the practices in future periods (MacDuffie, 1995; Maddala, 1977). However, I also evaluate the impact of the pay practices without using the extended data-set.

5.3.5 Control Variables

The quality of the workforce and skill level is controlled for by including whether the blue collar workforce is given multi-skill training (Multi-skill). Multi-skilling of the workforce is increasingly being used in establishments which are subject to product market competition and need considerable flexibility in the workforce. This variable may not only capture the effects of skill-levels but also the macro-level product market condition which the firm operates within. In order to control for economies and diseconomies of scale on performance I include the log of number of employees at the establishment (LogEstSize). In order to control for the effects of unionization on establishment profitability a dummy variable is included if an establishment has a union (Union). In order to control for the additional efficiency effects associated with a high level of two-way employee - management communication I include a dummy variable for those establishments which have a high level of two-way communication (InfoShare). To capture the effects of management quality, I have included a measure of whether the establishment uses a functionally integrated strategic planning process (Strategy). The use of the strategy variable is meant to directly control for one of the primary factors which the use of panel data will attribute for. It is not unreasonable to think that the test variables are picking up some element of management quality which may well attribute for some of the superior performance. That is, if these establishments have chosen the correct human resource practice they may well have also chosen the correct market, finance, and strategic planning process. The strategy variable is attempting to pickup the existence of other correctly chosen management practices.

In the case of the productivity measure an augmented Cobb-Douglas production function is used. In addition to controlling for changes in labour, and capital, industry and year effects, also

evaluated is the impact which product market competition has on performance. According to Nickell et. al. (1996) product market competition is often associated with increased productivity. In order to control for the impact of competition on productivity a dummy variable measuring presence of an increasing degree of product market competition is included in regressions evaluating labour productivity (Industcomp).

The interviews were conducted over a five year period between 1992 and 1996. In order to control for any variations year dummy variables are included. To control for the effects by industry, sector dummies at the 2 digit level are included. The definition of the variables are found in table 5.5.

5.3.6 Interdependent Work Areas

This project sets out to evaluate the impact these various pay systems have on performance when the product produced is a result of a group or team effort. The survey questionnaire item used to identify if a particular establishment had a high degree of interdependence between work areas can be found in the appendix, exhibit 5.2.

5.3.7 Estimation Model and Analysis Technique

The two specifications used for the Cobb-Douglas production function include the following:

(1) $Perf = a + b_1 * PP + b_2 * Competition + b_3 * \ln(L) + b_4 * \ln(K) + b_5 *$(industry dummies) $+ b_6 *$ (year dummies) $+ e$

Where Perf = ln(sales/employee)

PP = dummy variable for presence of a pay practice

Competition = dummy variable if there is a 'high' degree of product market competition

ln(L) = ln(number of employees)

ln(K) = ln(assets)

e = error term assumed normally distributed i.i.d.

a, bi = coefficients

Also evaluated is the change in performance in time (t-1). In the absence of the identification of a suitable instrument in order to directly control for endogeneity, an evaluation of the performance in an earlier time period is evaluated in order to partially control for simultaneous bias. The specification is the following:

(2) $Perf_{t-1} = a + b_1 * PP_{t-1} + b_2 * Competition_{t-1} + b_3 * \ln(L)_{t-1} + b_4 * \ln(K)_{t-1} + b_5$ *(industry dummies) $+ b_6 *$ (year dummies) $+ e_{t-1}$

The fact that there is no variation in the independent variables over time rules out first difference which would control for fixed effects. However, in order to directly control for omitted variable bias, included are as broad a range of control variables as possible. The use of the OLS estimator will result in understated standard errors. The random effects estimator will avoid the problems imposed by OLS and, in addition, the use of the random effects model should control for any remaining unobserved heterogeneity.

In order to test for endogeneity between the independent variables and the performance measures one would ideally like to instrument the variables and check for reverse causality. A suitable instrument would be an identifiable exogenous event which would precipitate the use of the particular pay practice, but would have no relationship with the dependent variable. A legislative or tax law change influencing a firm's or establishment's choice of pay practice may be an example of a possible instrument. Unfortunately, the data-set does not contain any suitable instruments. Endogeneity will bias the coefficients when there is a simultaneous relationship between the test variable and the dependent variable. That is, more profitable establishments may be better able to use programmes such as profit-sharing, therefore, it will be difficult to determine which direction the arrow of causality is pointing. Becker and Hueslid (1996), argue that the alternative could also be true and firms which have lower than normal profits may also use contingent pay systems. In addition, prior research which has attempted to control for endogeneity has not found evidence of simultaneity bias (Bartel, 1994; Ichniowski, 1990). However, in order to partially mitigate the impact of simultaneity bias, I evaluate the dependent variable in time t and regress against the independent variables and controls in time t-1. If endogeneity poses a problem the use of lag variables may not entirely control for it, however, regressing the dependent variable on the independent variable from a previous time period clearly

counters the problem of current profitability influencing the decision to use a particular set of practices.

5.4 Results

5.4.1 Descriptive Statistics Analysis

Starting with the descriptive statistics found in table 5.6 the means for ROA and ROS are .12 and .06 respectively. Multi-skilling of the workforce is quite common with 46 per cent of the establishments using this form of training. Multi-skilling is still relatively new and may indicate the skill levels of the workers are high. Sixty per cent of the workplaces are unionized but only 21 per cent of the establishments have a 'two-way' top - down, bottom - up communication system in place. There may be some relationship between the relative high level of multi-skilling and this lower level of two-way communication. According to Lazear (1995), in establishments which invest in the multi-skilling of its workforce it is less necessary for them to invest in communication programmes because employees have already been trained in the information they need making information exchange less necessary. A full 70 per cent of the workplaces engage in a functionally integrated strategic planning process. Apparently, a formal strategic planning process has become an accepted part of managing an establishment. While the incidence of the various forms of pay taken individually has already been discussed, the three combinations have not. These include PRP (establishment uses either/or ownout, teamout, merit, pfshare, co-bonus but does not pay daypay), Timerate (paid either a salary or a flat rate but no PRP) and Grouppay (uses either profit-sharing or company bonus but not daypay). We see that only about one-third of the establishments use some form of performance-related pay. Fifty per cent of the

establishments paid only a flat rate or a salary. However, it was possible to evaluate the impact which group incentives (excluding establishments which pay a piece rate) had on performance given that 23 per cent of the establishments used this form of pay.

Among the correlations between the various variables, there are strong positive and negative relationships. As expected, there is a strong positive relationship between ROA and ROS (.85). There is a negative relationship between both team- and individual-based bonuses. There is also a negative relationship between daypay and flat rate pay, while there is a positive relationship between salary and the two financial measures. There is also a strong positive relationship with ROA and ROS for the multi-skilling variable, and as we would expect, a negative relationship with unionization. These relationships between the remuneration programmes and the other control variables and the performance measures will be further evaluated in the regression results.

Concerning the multi-skilling variable, there is a strong negative relationship with flat rate and merit pay, but a positive relationship with profit-sharing. This is expected, because in a workplace which multi-skills its workforce you would expect to see more group rather than individual remuneration programmes. There is a high relationship between multi-skilling and the measure of a high degree of production process interdependence.

The infoshare variable attempts to measure the existence of two-way communication systems in the establishment. There is a relationship between the communication variable and the size of the establishment, which you would expect to see. That is, larger establishments may be more likely to have communication mechanisms in place to facilitate information flow. There is also a positive correlation between team-based bonuses and communication and a negative one with

individual -based bonuses and two-way communication programmes. This may indicate the fact that you would expect to see a group-based pay system in a team production setting and you would also expect to see a greater level of communication in these team based settings.

Regarding the strategic planning variable, the larger the establishment the more likely it is to have a strategic planning process and a team-based incentive scheme. Also, the larger the establishment the greater the propensity to pay a salary and a reduced likelihood of paying a flat rate. There is also a relationship between team output and a company bonus. Asset size of the establishment is positively related to the existence of some performance related pay schemes, group incentive schemes and team based bonuses. There is a negative relationship with piece rates and flat rate pay. Finally, we see the expected relationships between the combined remuneration practice categories (e.g. PRP, timerate, grouppay) and the individual practices these categories are based on.

5.4.2 Regression Analysis

The results from the regressions are generally supportive of the premise that in team production settings we would expect to see higher levels of performance in organisations where there is some element of PRP. However, it does seem to matter what form of PRP is used; within this sample not all the contingent pay systems have the same effect. Considered first are return on assets in table 5.7: the first column (1) is a regression with test variables which include various combinations of the remuneration programmes; column (2) is the regression run with all the remuneration programmes included; column (3) is each of the remuneration programmes run individually in conjunction with the various control variables (given the differences in the

coefficients and standard errors associated with each of the regressions, they are not reported in this column); column (4) is a restricted sample of establishments which have 'interdependent' work areas; finally, column (5) is the results of the analysis using the unextended data-set, and the restricted sample of 'interdependent' work areas.

Starting with column (1) in table 5.7 we see that there is a positive coefficient associated with timerate (for detailed definition of this variable see table 5.5), however, it is not statistically significant. Next, looking at the PRP variable, while the variable is not statistically significant the coefficient is negative. The reason for this will become clearer when column (2) and (3) are discussed. Continuing to evaluate table 5.7 column (1), in the case of the group incentives they are associated with 12 per cent higher return on assets. This variable includes both establishments which pay profit-sharing or company bonuses. Some control variables in column (1) are significant including the unionization variable which is negative and significant at the 05 per cent level. This finding is in line with the results associated with unionization having a negative impact on profitability. We also see that the presence of multi-skilling has a positive significant effect on ROA and is significant at the .05 level. This result signals that there are efficiency effects associated with training the workforce in a variety of tasks, rather than relying on specialized job functions.

Column (2) is separated into various remuneration programmes in order to determine the impact each individual programme has on performance. It is through this exercise that it becomes apparent that, while pay for performance or sharing residual profits has a greater impact on performance, the form of PRP offered matters. With ROA there is a significant positive relationship associated with paying a flat rate, which is paying a straight hourly rate, as opposed

to paying a salary or paying a piece rate. In column (3) associated with paying a piece rate (Daypay), the coefficient is negative. In column (2) we see paying some form of incentive (Incent) is associated with a 9 per cent higher return on assets. While this is of interest, there is no way of knowing if these incentives are pecuniary or non-pecuniary making it is impossible to comment on association with performance. While none are statistically significant, both ownout and teamout have negative coefficients. While it is not advisable to read too much into this, given that the coefficients are not statistical significance, the fact that all three are negative is somewhat telling. This may reflect the fact that either individual or small group incentive schemes are counter-productive in a team production setting.

Looking firstly at the profit-sharing variable there is a small positive effect associated with profit-sharing but it is not statistically significant. While in the case of a company-wide bonus (CoBonus) we see that it is statistically significant at the .05 level. The multi-skilling variable is again significant at the .10 level. In column (3) where each of the pay practices are run independently with the controls, the same results are similar to column (2), however, individual-based incentives are negatively and statistically significant at the .10 level and CoBonus is significant at the .05 level. The restricted sample of highly interdependent work areas in column (4) shows essentially the same result as the other columns, which is expected given almost 75 per cent of the establishments have a medium to high degree of interdependence in their work areas. The only slightly notable difference between column (4) and the other columns is that in (4) incentive payments have a higher coefficient and individual level incentives have a slightly higher negative coefficient. In column (5) we see that the results are the same as in the other regressions using the extended data-set, both company bonus and other incentives have a positive significant effect on establishment performance. This specification also uses the restricted sample of

establishments with a moderate to high degree of interdependence.

Looking next at table 5.8 the dependent variables in time t are regressed against independent variables and control variables in time t-1, in order to partially mitigate the impact of endogeneity. The results are essentially the same found in table 5.7. However, due to sample size (n = 50) the unextended data-set was not evaluated. In general, the same results are found in table 5.9 ROS using time t and table 5.10 using time t-1. One difference in table 5.9 compared to table 5.7 is that the profit-sharing variable has a greater performance effect than does the CoBonus variable. Also, in the unextended data-set evaluated in column (5) in table 5.9, both the Incent and CoBonus variables are statistically significant at .01 and .10 respectively. In table 5.9 and table 5.10 using ROS there is also a significant statistical association with the fixed pay system of salary. This form of fixed pay system may reflect an establishment's attempt towards harmonization or an elimination of barriers between management and employees.

Finally, in table 5.11 the association with labour productivity is evaluated. Calculating the anti-log it is apparent that only the incentive variable is associated with higher levels of productivity. We see in column one the log-point is 0.06 (5.8%) in time t for the full data-set and a log point of 0.13 (12.2 %) for the restricted sample of establishments where task interdependence is high. The coefficients are the same for the sample in which t-1 is used.

Table 5.4 is an example of two establishments, one which has chosen to put 'progressive' pay practices into place, the second has rather chosen to use a more 'traditional' form of pay practices. In establishment 1 the choice of payment systems include paying shopfloor workers a salary, team-based pay, a company bonus and a mix of pecuniary and non-pecuniary benefits. Establishment

2 has chosen to pay a flat rate, an individual-based output bonus and profit-sharing. Establishment 1 has a 21 per cent better return on assets than does establishment 2.

While the intercept was not reported in column 5 because each reported coefficient and standard error is derived from independently run regressions, the approximate level was between 11 and 12 percent. These results suggest that the establishments which *do not* use these payment systems have between 11 and 12 percent return on assets. The gains associated with the use of these payment systems, as detailed in this analysis, are *in addition* to these average levels. For example, comparing establishment 1 and establishment 2 to the average establishment which does not use these payment systems (establishment 3) would result in the following return on asset level: establishment 3, 12%, establishment 2, 7% (12% - 5%) and establishment 1, 28% (12% + 16%) Are these levels believable? In light of the current research in the area, yes. Huselid (1995) finds firms which use 'progressive' human resource practices, which include goal aligning incentive systems such as profit-sharing have annual sales as high as USD 100,000 per employee. Ichniowski et. al., (1995) finds production lines to be 7% more productive resulting in increased revenues of 2.5 million. The gains found in this empirical work are not out of line with the findings of these other researchers.

Table 5.4

Example of 'Progressive' Pay Plans versus 'Traditional' Pay Plans (Using column 5 in Table 5.7 - Return on Assets)

Establishment 1 (Progressive Remuneration Practices)		Establishment 2 (Traditional Remuneration Practices)	
Salary	**.02**	**Flat rate**	**.01**
Teamout	**-.11**	**Ownout**	**-.08**
CoBonus	**.11**	**Pfshare**	**.02**
Incentives	**.14**		
TOTAL	**.16**		**-.05**

5.5 Conclusion

This chapter has evaluated the impact which various individual and group variable pay systems in team production settings have on establishment performance. While there is some theoretical and empirical support that performance-based pay has greater performance effects than fixed pay in individual productions settings, there is little empirical evidence evaluating these effects in team settings where the work areas are 'interdependent' on one another.

Specifically evaluated is the impact which time-based pay schemes, individual and team incentive schemes and group incentive schemes have on establishment performance. The results show that group incentive schemes produce the greatest performance outcomes. These results remain robust

in both time t and in time t-1 which is used to help control of the effects of endogeneity. In the restricted sample of only establishments which have a high degree of 'interdependent' work areas, the results remain the same. In addition, the findings indicate that individual- and team-based incentive programmes result in negative performance outcomes.

The findings of this work is that in work environments where the production process consists of 'interdependent' work areas, group-based incentives are associated with better financial performance than either team, individual or merit payment systems. Also, incentives are associated with higher levels of productivity in these same establishments.

Table 5.5

Variable Definition

Variable	Definition
ROA	Pre-tax profit divided by assets.
ROS	Pre-tax profit divided by total establishment sales.
Salary	1 if the shopfloor workers are paid basis a salary, 0 otherwise.
Flat rate	1 if the shopfloor workers are paid basis an hourly rate, 0 otherwise.
Daypay	1 if the shopfloor workers are paid basis a piece rate programme, 0 otherwise.
Ownout	1 if the establishment has an individual output based incentive programme, 0 otherwise.
Teamout	1 if the establishment has a team based incentive programme, 0 otherwise.
Merit	1 if the establishment has a merit based pay system, 0 otherwise.
Pfshare	1 if the establishment has a company profit-sharing programme, 0 otherwise.
CoBonus	1 if the establishment has a company bonus programme, 0 otherwise.
Incent	1 if the establishment has another incentive programme, 0 otherwise.
PRP	1 if the establishment has either/or ownout, teamout, merit, pfshare, cobonus, however, does not pay daypay, 0 otherwise.
Timerate	1 if the establishment pays shopfloor workers via either a salary or a flatrate, however, does not use daypay or PRP, 0 otherwise.
Grouppay	1 if the establishment has either profit-sharing or company bonus, however does not pay daypay, 0 otherwise.
Union	1 if the establishment has a union, 0 otherwise.
Multi-skill	1 if the establishment uses multi-skill training, 0 otherwise.

Variable Definitions cont'd

Links2	1 if the establishment has a high level of 'interdependent' work areas, 0 otherwise.
Infoshare	1 if the establishment has a high level of Mgmt>Employee Employee>Mgmt communication, 0 otherwise.
Strategy	1 if the establishment has a functionally integrated strategic planning process.
IndustComp	1 if the level of competition in the industry has increased in the last 5 years.
LogEstSize	Log of the average number of employees in the given year.
LogAssets	Log of gross book value of depreciable assets.

Year in which interview took place and sector dummies also included in regressions.

Table 5.6

Variable Means, Standard Deviations, and Correlations
(Does not include correlations between remuneration practices which were reported in Table 5.3)

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12
1. ROA	.12	.14												
2. ROS	.06	.09	.85											
3. Multi-skill	.46	.50	.19	.26										
4. Union	.60	.46	-.15	-.15	.02									
5. Infoshare	.21	.41	-.02	.11	.08	.07								
6. Strategy	.70	.46	.01	.06	.14	-.20	-.02							
7. LogEstSize	5.34	.83	.08	.08	.03	.05	.18	.05						
8. LogAssets	8.77	1.8	.07	.08	.14	.02	.00	.22	.45					
9. PRP	.35	.47	.11	.21	.08	.02	.04	.07	.16	.21				
10.Timerate	.57	.50	.09	.13	-.05	.01	.21	.05	-.02	.08	-.07			
11. Grouppay	.22	.41	.24	.34	.08	-.12	.00	.05	.11	.21	.75	-.02		
12. Links2	.75	.44	.07	.04	.25	-.18	.02	.23	-.07	-.02	-.03	.03	.06	
13. Salary	.21	.41	.12	.32	.18	-.12	.12	.10	.39	.22	.16	.21	.11	.02
14. Flat rate	.73	.44	-.02	-.16	-.20	.04	.05	-.06	-.33	-.18	-.20	.62	-.15	-.05
15. Daypay	.06	.23	-.08	-.15	-.06	-.08	-.13	-.07	-.05	-.18	-.27	-.18	-.11	.03
16. Merit	.13	.34	.03	.05	-.34	.01	-.17	-.16	-.03	-.10	.23	-.04	.22	-.19
17. Incent	.27	.45	.33	.30	.12	-.16	-.03	.08	.17	.03	.07	-.10	-.05	.05
18. Teamout	.11	.31	-.11	-.15	-.03	.07	.21	.21	.26	.24	.24	-.03	-.03	.05
19. Ownout	.09	.28	-.17	-.19	-.07	.16	-.17	-.09	-.04	-.09	.22	-.47	.05	.18
20. CoBonus	.22	.41	.24	.24	.01	-.28	-.07	-.02	.17	.10	.46	-.27	.49	.01
21. Pfshare	.22	.41	.15	.22	.19	.03	-.05	-.09	.10	.25	.49	-.12	.14	.07

(n = 168)
All correlations = > .10 are significant at the .10 level, those > =.13 at the .05 level, those = > .17 at the .01 level, those = >.23 at the .0001level.

Table 5.7
Random Effects Estimates (Return on Assets - ROA) for UK Manufacturing Establishments Shopfloor Worker Remuneration Schemes. (Standard Errors in Parentheses.)

Variables	1 (t)	2 (t)	3 (t)	4 (t)	5 (t)
Salary	——	.04	.04	.03	.02
		(.05)	(.04)	(.05)	(.05)
Flat rate	——	.08*	.03	.01	.01
		(.05)	(.05)	(.04)	(.04)
Daypay	——	——	-.07	-.11	-.10
			(.07)	(.08)	(.08)
Incent	——	.09***	.11***	.16***	.14***
		(.04)	(.04)	(.04)	(.04)
Ownout	——	-.05	-.10*	-.10	-.08
		(.06)	(.06)	(.05)	(.06)
Teamout	——	-.03	-.05	-.07	-.11
		(.05)	(.05)	(.06)	(06)
Merit	——	.00	.02	-.02	.05
		(.07)	(.06)	(.08)	(.08)
Pfshare	——	.01	.05	.05	.02
		(.04)	(.04)	(.05)	(.05)
CoBonus	——	.08*	.10**	.12**	.11**
		(.04)	(.03)	(.06)	(.05)
Timerate	.02	——	——	——	——
	(.04)				
PRP	-.04	——	——	——	——
	(.04)				
Grouppay	.12***	——	——	——	——
	(.05)				
Union	-.06**	-.02	——	——	——
	(.03)	(.03)			
Multi-skill	.07**	.07**	——	——	——
	(.03)	(.03)			
Strategy	-.03	-.01	——	——	——
	(.04)	(.04)			
Infoshare	-.003	-.001	——	——	——
	(.04)	(.04)			
LogEstSize	.02	.01	——	——	——
	(.02)	(.02)			
Intercept	.12	.08	——	——	——
	(.12)	(.14)			
$\bar{R}2$	.22	.32	——	——	——
N	166	166	166	132	98

Column (1), Regression includes combined pay practices + control variables.
Column (2), Regression includes all pay practices + control variables.
Column (3), Regression includes single practices + controls (controls not reported - NR).
Column (4), Restricted sample with interdependent work areas and single pay practices + controls (NR).
Column (5), Regression uses unimputed data. Includes restricted sample of est. with interdependent work areas and single pay practices + controls (controls not reported).
*Statistically significant at the .10 level; **at the .05 level; *** at the .01 level.
Note: Sector and year in which interview conducted dummies included in regression but not reported.

Table 5.8
Random Effects Estimates (Return on Assets - ROA) for UK Manufacturing Establishments Shopfloor Worker Remuneration Schemes. (Standard Errors in Parentheses.)

Variables	1 (t-1)	2 (t-1)	3 (t-1)	4 (t-1)
Salary	——	.04	.03	.03
		(.05)	(.05)	(.06)
Flat rate	——	.09*	.01	.02
		(.05)	(.04)	(.05)
Daypay	——	——	-.07	-.09
			(.03)	(.09)
Incent	——	.10***	.12***	.17***
		(.04)	(.04)	(.05)
Ownout	——	-.01	-.05	-.11
		(.06)	(.06)	(.07)
Teamout	——	-.06	-.08	-.09
		(.05)	(.05)	(.07)
Merit	——	-.00	.01	.02
		(.07)	(.06)	(.09)
Pfshare	——	.01	.05	.07
		(.04)	(.04)	(.05)
CoBonus	——	.09**	.08*	.14**
		(.05)	(.05)	(.07)
Timerate	.04*	——	——	——
	(.04)			
PRP	-.04	——	——	——
	(.04)			
Grouppay	.14***	——	——	——
	(.04)			
Union	-.06*	-.02	——	——
	(.03)	(.03)		
Multi-skill	.08***	.07**	——	——
	(.03)	(.03)		
Strategy	-.04	-.03	——	——
	(.03)	(.04)		
Infoshare	.02	.02	——	——
	(.04)	(.04)		
LogEstSize	.02	.02	——	——
	(.02)	(.03)		
Intercept	.01	-.01	——	——
	(.12)	(.15)		
$\bar{R}2$	.28	.33	——	——
N	134	134	134	106

Column (1), Regression includes combined pay practice + control variables.
Column (2), Regression includes all pay practices + control variables.
Column (3), Regression includes single pay practices + controls (controls not reported).
Column (4), Regression includes restricted sample of establishments with interdependent work areas and single pay practices + controls (controls not reported).
*Statistically significant at the .10 level; **at the .05 level; *** at the .01 level.
Note: Sector and year in which interview conducted dummies included in regression but not reported.

Table 5.9
Random Effects Estimates (Return on Sales - ROS) in UK Manufacturing Establishments for Shopfloor Worker Remuneration Schemes. (Standard Errors in Parentheses.)

Variables	1 (t)	2 (t)	3 (t)	4 (t)	5 (t)
Salary	——	.04**	.04***	.05**	.04**
		(.02)	(.02)	(.02)	(02)
Flat rate	——	.02	-.02	-.01	.02
		(.02)	(.01)	(.00)	(.02)
Daypay	——	——	-.03	-.05	-.04
			(.03)	(.03)	(.03)
Incent	——	.03*	.03**	.06***	.06***
		(.02)	(.01)	(.02)	(.02)
Ownout	——	-.01	-.04*	-.05	-.03
		(.02)	(.02)	(.03)	(.03)
Teamout	——	-.02	-.03	-.04	-.05
		(.02)	(.02)	(.03)	(.03)
Merit	——	-.02	.03	.05	.05
		(.03)	(.02)	(.04)	(.03)
Pfshare	——	.02	.03**	.05**	.03
		(.01)	(.02)	(.02)	(.02)
CoBonus	——	.02	.04**	.03	.04*
		(.02)	(.02)	(.03)	(.02)
Timerate	.01	——	——	——	——
	(.02)				
PRP	-.01	——	——	——	——
	(.02)				
Grouppay	.04**	——	——	——	——
	(.02)				
Union	-.02	-.01	——	——	——
	(.01)	(.01)			
Multi-skill	.03**	.03**	——	——	——
	(.01)	(.01)			
Strategy	-.01	-.001	——	——	——
	(.01)	(.01)			
Infoshare	.01	-.01	——	——	——
	(.01)	(.02)			
LogEstSize	.01	.00	——	——	——
	(.01)	(.01)			
Intercept	.03	.05	——	——	——
	(.05)	(.06)			
$\bar{R}2$	.28	.33	——	——	——
N	166	166	166	132	98

Column (1), Regression includes combined pay practice + control variables.
Column (2), Regression includes all pay practices + control variables.
Column (3), Regression includes single pay practices + controls (controls not reported).
Column (4), Restricted sample of est. with interdep. areas and single pay practices + controls.
Column (5), Regression uses 'unimputed' data (controls not reported).
*Statistically significant at the .10 level; **at the .05 level; *** at the .01 level.
Note: Sector and year in which interview conducted dummies included in regression but not reported.

Table 5.10
Random Effects Estimates (Return on Sales - ROS) in UK Manufacturing Establishments for Shopfloor Worker Remuneration Schemes. (Standard Errors in Parentheses.)

Variables	1 (t-1)	2 (t-1)	3 (t-1)	4 (t-1)
Salary	——	.05**	.04***	.04
		(.02)	(.02)	(.02)
Flat rate	——	.02	.00	-.00
		(.02)	(.02)	(.02)
Daypay	——	——	-.04	-.05
			(.03)	(.03)
Incent	——	.03*	.03***	.06***
		(.02)	(.01)	(.02)
Ownout	——	-.01	-.04*	-.02
		(.03)	(.02)	(.03)
Teamout	——	- .02	-.03*	-.04
		(.02)	(.02)	(.03)
Merit	——	.02	.03	.04
		(.03)	(.02)	(.04)
Pfshare	——	.02	.03*	.04**
		(.02)	(.01)	(.02)
CoBonus	——	.02	.02*	.03
		(.02)	(.02)	(.02)
Timerate	.03*	——	——	——
	(.01)			
PRP	-.01	——	——	——
	(.02)			
Grouppay	.05**	——	——	——
	(.02)			
Union	-.01	.00	——	——
	(.01)	(.01)		
Multi-skill	.03***	.03**	——	——
	(.01)	(.01)		
Strategy	-.01	.00	——	——
	(.01)	(.02)		
Infoshare	.01	-.01	——	——
	(.02)	(.02)		
LogEstSize	.00	-.01	——	——
	(.01)	(.01)		
Intercept	.02	.05	——	——
	(.05)	(.06)		
$\bar{R}2$	.28	.34	——	——
N	134	134	134	106

Column (1), Regression includes combined pay practice + control variables.
Column (2), Regression includes all pay practices + control variables.
Column (3), Regression includes single pay practices + controls (controls not reported).
Column (4), Regression includes restricted sample of establishments with highly interdependent work areas and single pay practices + controls (controls not reported).
*Statistically significant at the .10 level; **at the .05 level; *** at the .01 level.
Note: Sector and year in which interview conducted dummies included in regression but not reported.

Table 5.11
Random Effects Estimates for Labour Productivity (LogSales/EE) in UK Manufacturing Establishments for Shopfloor Worker Remuneration Schemes.
(Standard Errors in Parentheses.)

Variables	1 (t)	2 (t)	3 (t-1)	4 (t-1)
Salary	.06	.06	.06	.05
	(.04)	(.06)	(.05)	(06)
Flatrate	.07	.11	.06	.11
	(.04)	(.05)	(.05)	(.06)
Daypay	———	———	———	———
Incent	.06*	.13***	.06	.13**
	(.04)	(.05)	(.04)	(.06)
Ownout	.09	.11*	.08	.11
	(.06)	(.07)	(.06)	(.07)
Teamout	-.08	-.06	-.09	-.08
	(.05)	(.07)	(.06)	(.07)
Merit	-.05	-.02	-.05	-.04
	(.05)	(.07)	(.05)	(.09)
Pfshare	.02	.00	.02	.00
	(.03)	(.05)	(.04)	(.05)
CoBonus	.04	-.04	.05	-.03
	(.03)	(.06)	(.04)	(.06)
LogAsstEE	.05	.02	.05	.02
	(.03)	(.03)	(.05)	(.05)
LogEstSize	-.14***	-.15***	-.15***	-.15***
	(.02)	(.03)	(.02)	(.03)
IndustComp	.02	.05	.02	.04
	(.03)	(.05)	(.04)	(.05)
Intercept	2.36***	2.43***	2.36***	2.43***
	(.15)	(.17)	(.18)	(.21)
$\bar{R}2$	.59	.53	.55	.51
N	181	132	139	103

Column (1), Regression in time t.
Column (2), Regression in time t for restricted sample of 'team production' settings.
Column (3), Regression in time t - 1.
Column (4), Regression in time t - 1 for restricted sample of 'team production' settings.

*Statistically significant at the .10 level; **at the .05 level; *** at the .01 level.
Note: Sector and year in which interview conducted dummies included in regression but not reported.

5.6 Appendix

5.6.1 Questionnaire Items

Exhibit 5.1

Pay Systems Questionnaire Item

J. HUMAN RESOURCE MANAGEMENT

8. Reward

(ii) On what basis are shopfloor workers paid? (tick all those that apply)

a.	Flat time rate	[ ]
b.	Output incentive/bonus (individual)	[ ]
c.	Output incentive/bonus (team)	[ ]
d.	Merit rating	[ ]
e.	Measured day work	[ ]
f.	Company profit share	[ ]
g.	Company bonus	[ ]
h.	Salaried	[ ]

(iv) Are there any other incentive schemes in the company?

Yes [ ]
No [ ]

Exhibit 5.2

Work Area Interdependence Questionnaire Item

F. PRODUCTION TECHNOLOGY

6. Interdependence

(ii) For your principal product group, to what extent are different parts of the process interdependent?

Not at all	A little	A moderate amount	Quite a lot	A great deal
1	2	3	4	5

5.6.2 Control Variables

Exhibit 5.3

Control Variable Questionnaire Items

InfoShare: **Definition and Measurement Means:**

Infoshare: (Infoshare) Defined as the presence of two-way communication within the Establishment.

Measurement: Establishment is considered to have an element of two-way information sharing if it has a suggestion plan in place and also meets at least monthly with Shopfloor workers.

Questionnaire Items:

N. Research and Development
7. Communication
How often are there:
(ii) written/verbal briefing on company performance or other company issues to management?
never/daily/weekly(bi)/monthly(bi)/quart/6mos /annual
10. Does the company have any schemes for promoting
innovation (eg a suggestion scheme)?
(i) Yes [ ]
(ii) No [ ]

Est_Size: **Definition and Measurement Means:**

Est_Size: (Est_Size) Total number of employees in the Establishment.

Measurement: Number of employees in the year of the interview.

Questionnaire Item: B. Organisational Overview
5. Organisational Details (Business Unit)
(ii) Current number of employees

Assets: **Definition and Measurement Means:**

Asset/EE: (Asset/EE) Measure of Capital Intensity.

Measurement: Gross book value of depreciable assets/ # of employees.

Union: **Definition and Measurement Means:**

Union: (Union) Whether or not the Establishment is Unionized.

Measurement: Dummy variable if the Establishment has a Union.

Questionnaire Item: K. Industrial Relations
1. Is the company unionized?
Yes [ ]
No [ ]

Multi-Skill : **Definition and Measurement Means:**

Multi-Skill: (MultiSkill) Whether shopfloor workers are multi-skilled.

Measurement: Dummy variable if the establishment has a considerable multi-skilling or is fully multi-skilled.

Questionnaire Item: G. Work design
4. Are they (blue collar workers) predominantly single or multi-skilled?
[ ] Considerable multi-skilling
[ ] Fully multi-skilled

Industry: **Definition and Measurement Means:**

Industry: (Industry) The principal business activity of the Establishment.

Measurement: SIC code

Questionnaire Item: B. Organisational Overview
3. Business of Unit
In this business unit, what are the main product groups?
SIC

Year: **Definition and Measurement Means:**

Year: (Year) The year the establishment was founded.

Questionnaire Item: B. Organisational Overview
5. Organisational Details (Business Unit)
(i) When founded (year)

Strategy: **Definition and Measurement Means**

Strategy: (Strategy) Defined as the presence of a business planning process which is integrated with the firm's various functional departments.

Measurement: Establishment is considered to have an integrated strategic planning process if the establishment has a formal plan and at least most of the functions are covered in the plan.

Questionnaire Items: E. Competitive Strategies
7. Strategic Planning
(i) Do you have a strategic plan?
(iii) Which of the functions are covered by these plans?
Some [ ]
Most [ ]
All [ ]

Incompet: Definition and Measurement Means

Incompet: (Incompet)

Measurement: Establishment is considered to have a high level of competition in the industry if the competition has increased in the last 5 years.

Questionnaire Items:

D. Market Environment
2. Competitors
(vi) In the last 5 years, has the level of competition in the industry
increased [ ]
stayed the same [ ]
decreased [ ]

Chapter 6

Independent and Interactive Effects of Shopfloor Worker Decentralized Decision-Making and Group Incentive Schemes

6.1 Introduction

In the previous chapter, we saw that 'co-operative' incentives systems were more effective in team production settings than 'competitive' or tournament pay systems. There is, however, still a problem with 'group' incentive schemes which is the 'free-rider' or 1/n problem. As the number of employees or the size of n increases it becomes increasingly difficult to see how any one individual's effort affects share price or profitability. As mentioned in the theoretical section and again in the case study in Chapter 4, Weitzman (1995) suggests that in order to help address the effects of the free-rider problem, a 'co-operative' culture needs to be developed. This is further supported by Drago and Turnbull (1988), as mentioned in Chapter 5, who contend that group incentives are more likely to be effective in settings where an organisational culture which promotes trust and co-operation. In this chapter, the impact which group incentives have on establishments when used independently, establishments which use practices which may help develop a 'co-operative culture' which places a high degree of 'trust' in employees, and those establishments which have both group incentives and a co-operative or 'trusting' culture are evaluated.

Organisations are increasingly using employee involvement programmes and financial participation programmes which share a firm's profits in the form of dispersing shares or profit-sharing. There is also increasing research into which of these types of financial participation are

associated with the greatest performance outcomes (Cooke, 1994; Fernie and Metcalf, 1995). Researching the impact of these practices in combination is well warranted because economic and psychological theory support the fact that much of the gains associated with the use of these combined practices are due to those with the greatest job knowledge having the incentive and authority to act on their superior knowledge (Levine and Tyson, 1990). The questions evaluated in this chapter include: is it advantageous for firms to use participation programmes such as participation in decision-making, two-way information sharing and financial participation such as profit-sharing? If so, where do the performance effects actually lie?; are they associated with participation in decisions, financial participation or the combination of the two?

I start with an overview of some of the theoretical considerations and previous empirical work on employee involvement and group incentives used independently and interactively. Following this is the evaluation of the impact that employee involvement, (focussing on information sharing and decentralized decision-making), has on firm performance. Next, an evaluation of the impact of the independent and interactive effects of a high level of shopfloor worker decentralized decision-making and group incentives, on establishment performance, is conducted. In addition, while the majority of the establishments have an 'interdependent' team production process, a restricted sample of establishments which have a high degree of work area interdependence is examined.

6.2 Theoretical and Empirical Overview

6.2.1 Control and Return Rights: Incentive Contracts, Asymmetric Information and Rights of Ownership

Incentive contract theory asks the fundamental questions which are addressed in this chapter. Why do employees work hard when their work can not be perfectly monitored, and how can they be motivated to provide productivity enhancing ideas when they have knowledge of the production process which management does not have (Lazear, 1986)? There are an infinite number of different forms and types of incentive contracts which employers can choose from and some have more efficient outcomes than others. One of the primary reasons these incentive contracts are necessary is because employees have access to productivity-enhancing information. These questions of how to most effectively monitor and motivate employees are especially pertinent now because of the greater levels of private information which reside with employees (Levine and Tyson, 1990). It has long been recognized that information asymmetries exist in organisations and employees have private information from which management could benefit. Given the increasing educational attainment, more company training and information technology, greater amounts of private information may reside with employees, so it maybe advantageous for firms to gain access to this information.

Milgrom and Roberts (1992) indicate that the concept of ownership, combined with statutory property rights are the fundamental means to provide an incentive to create and develop an asset. The two fundamental aspects of ownership include: firstly, the rights of 'residual rights of control', which is the right to make decisions concerning the use of an asset; secondly, the right to 'residual returns' which is the right to revenues left over after all obligations have been met. According to Milgrom and Roberts it is the combination of these two rights which provides the individual incentive effects of ownership. The combination is seen to be the most powerful incentive due to the fact that the person making the decision bears the financial results of their decision. Milgrom and Roberts also state that these effects are most efficient when these property

rights are 'transferable', or are able to be assigned to the person who is best suited to be in charge. Further developing the notion of sharing the rights of ownership are Ben-Ner and Jones (1995). Ben-Ner and Jones develop a theoretical framework which combines these two aspects of ownership, control and return, and suggest possible firm performance outcomes associated with transferring these rights from owners to non-owner employees.[1] They contend that the greatest efficiency outcomes exist when *both* these rights are transferred from owners to non-owners.

6.2.2 Control Rights - Employee Involvement: Two-way Communication and Decentralization of Job Tasks

Employers are increasingly attempting to access potentially productivity-enhancing information which resides with employees. There has been a broad variety of different employee participation and involvement programmes put in place by employers primarily to obtain this information. The intent of quality circles, information-sharing meetings, teams, employee involvement and participation programmes has, at least partially, been to access the information which exists with employees (Wagner, 1994). Two practices in particular which attempt to gain access to the information to which employees have access to are the decentralization of decisions and mechanisms such as meetings or information-sharing sessions, designed to either convey information about the state of the business or to access useful information which employees may possess. In particular, there has recently been a focus on pushing decisions down to lower levels in the organisation. These efforts are associated with the belief that there are decisions and tasks which employees are in a better position to make than those further up in the organisation.

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[1] For a more complete explanation regarding the hypothesised productivity effects of control and return rights see Ben-Ner and Jones, IR (1995).

In both economic and psychological theory there is some support for the use of employee involvement, especially in situations of asymmetric or private information. One of the primary benefits associated with the use of employee involvement programmes is that employees have access to information and knowledge from which management could benefit (Levine and Tyson, 1990). Psychological theory describes another mechanism associated with the productivity effects of participation; the impact of participation and involvement on individual motivation and, correspondingly, on individual effort. The theoretical view is associated with the psychological theory - affective theory. Affective theory states that being able to participate in the work process would appeal to an individual's higher order needs, which in turn will lead to greater work satisfaction. In so far as work satisfaction has a positive impact on effort, greater satisfaction may translate into greater productivity (Miller and Monge, 1986). A further reason why it is thought that employee involvement has an impact on establishment performance is that there are organisational structural changes which occur in a participatory environment which promote cost savings to the establishment. Participation is thought to promote mutual monitoring (Bradley and Gleb, 1981) which may result in reduced direct costs associated with less need for supervisors to act as monitors.

However, it is thought that there may be problems associated with using a high degree of employee involvement without any incentives. In situations where employees have a high degree of control over their work or involvement in, for example, how their work is carried out, without incentives, there is the opportunity for moral hazard. Moral hazard or self-interested misbehaviour is the potential to shirk duties or responsibilities in so far as monitoring will allow (Milgrom and Roberts, 1992). In a situation where employees have either control over the job task or are highly involved in the work process, they may be in a position where they can reduce effort, thus not

achieving optimal performance.

The majority of research into worker participation has been within the very broad area of 'employee participation'. This concept encompasses practices ranging from ornamental employee advisory committees, with employees only able to make suggestions, to initiatives which give employees primary control over the work process and many of the decisions which are made regarding how the work is carried out. In previous research, the typical means of measuring whether a firm or establishment does have employee participation programmes or processes is to ask whether quality circles, advisory committees or employee involvement initiatives exist. At the firm level this type of question tells us very little, and depending on measures used, could tell us very little at the establishment level.

While some of the empirical evidence is mixed in relation to the performance effects of employee involvement, the majority of the evidence shows there is a positive association between employee involvement and company performance. Berman and Berman (1989) found there was a significant negative relationship between employee involvement and their measure of productivity. Levine and Tyson (1990) found there to be mixed effects associated with employee involvement, largely dependent on the form of employee involvement used. They found participation to be more effective in settings where incentives were included, and the type of participation was substantive. In a meta-study of 43 research articles Doucouliagos (1995) found that participation was overall associated with greater performance in all cases except co-determination, where there was a negative association with performance.

6.2.3 Return Rights - Group Incentives

The overall theoretical argument associated with an increase in productivity linked to profit-sharing is largely due to increased efficiency associated with the use of labour (Bhargava, 1994; Fitzroy and Kraft, 1986, 1987; Wietzman and Kruse, 1990). The rationale used to support the potential productivity effects of profit-sharing is that the increase in effort, including greater opportunity to act on asymmetric information, increased co-operation among workers, and that more peer monitoring may result in a greater level of productivity in profit-sharing firms.

Much of the theorised increased productivity effects associated with group incentive schemes concerns the fact that employees in profit-sharing firms have a greater level of motivation and exhibit a higher level of effort (Bhargava, 1993, 1994; Cable and Wilson, 1990; Wadhawani and Wall, 1990). Group incentives are here meant to include practices such as profit-sharing or company-wide bonuses. Regarding the positive effects of these incentives, the work of Weitzman (1988, 1990) and Kruse (1988, 1993) has drawn substantial attention to the productivity and employment effects of group incentive schemes or profit-sharing. The positive productivity effects associated with these group incentive schemes are primarily due to employees aligning their efforts[2] in a direction which maximizes profits. Other positive influences include the fact that there should be a higher degree of mutual monitoring which will reduce the need for supervisory control and associated costs.

There are, however, arguments against any productivity effects associated with group incentive

[2] See Lazear (1995) for support of the contention that making employees full residual claimants is the most efficient incentive contract.

schemes such as profit-sharing and company bonuses. One of the strongest charges against the productivity-enhancing effects of group-based incentive scheme is the free-rider or 1/n problem. In addition to the free-rider problem there is also the fact that many employees may be averse to increasing the amount of compensation which they have at risk. The firm may be in a better position to absorb any risk associated with outside factors affecting remuneration.[3] The free-rider problem has been dealt with largely by relying on arguments taken from game theory (Weitzman and Kruse, 1990). The argument states that there is a co-operative and non-co-operative solution associated with group interactions. As people engage in a repeated game they have a choice to 'free-ride' on the efforts of others or to work together. In the matter of profit-sharing it is the case that when everyone works together everyone will be better off. Consequently, as the game is repeated those involved may eventually move towards a co-operative solution.

Weitzman (1995) points out that for profit-sharing to work there needs to be something else present. He states that there needs to be something akin to 'company spirit'; this is needed to reduce the negative effects associated with the free-rider problem. In their theoretical work Drago and Turnbull (1988) determine that group incentives are more efficient than individual incentives in team production settings, provided a climate of 'trust' and co-operation is developed. It may be that a high degree of employee involvement and decentralization is a signal to workers which promotes an environment of trust and a co-operative culture. This view is supported by a number of theorists including: Kandal and Lazear (1992); Weitzman and Kruse (1990); Drago and Turnbull (1988). The rationale being that in settings where it is difficult to monitor effort or

[3] While the free-rider problem recognizes the fact that there is a reduction in the incentive effects as you increase n, this also implies that as n increases the aversion associated with risk bearing is also diluted. However, in either case there is a recognition that there is an incentive effect associated with some compensation being at risk. The incentive effects of compensation at risk are supported by Fernie and Metcalf (1996).

output, workers need to feel sufficiently guilty about letting down their peers so that this will prevent them from shirking their duties. According to Lazear (1995), those firms which invest in developing bonds between workers are those which should have profit-sharing.

There are, however, problems when return rights are used in isolation. According to Ben-Ner and Jones (1995), in the case of only return rights, economic theory states that if residual returns are going to employees there may be less incentive for owners and their agents to direct and control employees in a way which positively impacts establishment performance. While employees motivated by financial incentives may exert more effort, productivity depends on how well management can direct these efforts. Return rights in themselves may have a positive impact on structural variables, which may in turn positively impact co-operation among individuals and various parts of the organisation. This would take place because there is a greater alignment of objectives which could, therefore, generate an incentive to maximize firm performance. There is, however, the issue that as profits are shared more generally with employees there will be less incentive for owners and their agents to direct and monitor the work of employees.

The empirical evidence in the UK on the effects of group incentives on firm profitability is small. Bhargava (1994) using a panel data-set which allows a robust control for firm fixed effects and allows an examination of the introduction of a profit-sharing plan on profitability, finds there to be a positive effect of profit-sharing on the profitability of the firm. The result remains robust even after controlling for potential endogeneity. Estrin and Wilson (1986) and Cable and Wilson (1989) find that the average rate of return on capital is higher in profit-sharing firms than non-profit sharing firms. Using share price as a proxy for profitability, Richardson and Nejad (1986) find there to be a positive association with profit-sharing.

6.2.4 Combination of Work Task Control and Group Incentive Schemes

In a situation where control and return rights are combined the interests of the principal and their agents may be more closely aligned. Combining the claim to residual profits with control over work processes creates an environment in which employees have the authority to use their superior job knowledge to enhance efficiency, as well as the incentive to ensure they align their efforts with the best interests of the establishment. Through combining group incentive schemes and worker control over the work process both the moral hazard and, to a degree, the free-rider problem are addressed. By combining both of these practices, those with the greatest job information and who are in the best position to make efficiency-enhancing job changes, are provided with the incentive necessary to improve establishment performance. The combination of these practices reduces the moral hazard problem due to the fact that people now have the incentive necessary to minimize employee shirking.

There is additional support for the combined use of these two practices taken from psychological theory. While there may be some effect on effort associated with workers increasing their involvement and participating, without any incentives, these effects may not be as pronounced. Incentives would serve to align the interests of owners and employees so employees' efforts would be in a direction which would maximize the profits of the firm. If these incentives are absent, employees would be more likely to engage in shirking, especially in a situation where they have considerable control or involvement in the work process. The missing link is found in the psychological theory - expectancy theory. Expectancy theory asks the question *"what's in it for me?"* and gives a psychological framework for ensuring that employees are presented with incentives to perform their jobs in a way which aligns their interests with those of the firm.

There are a number of studies which explore the relationship between combining control and return rights and the impact they have on organisational outcomes. Conte and Svejnar (1988) find that employee participation (EP) and profit-sharing had significant effects both independently and combined. Mitchell et al. (1990) found that employee participation and group-based incentives were significant independently but not combined. Kruse (1993) found positive effects of profit-sharing but no combined effects or independent effects of EP. Cooke (1994) found that the combination of EP and group-based compensation schemes had fairly substantial effects on firm performance. These effects were also considerably amplified in unionized firms. Fernie and Metcalf (1995) found that workplaces with employee involvement characteristics, such as employee-management communication channels and the presence of incentive schemes, had higher productivity than other types of workplaces.

6.3 Data and Test Variable Measurement

6.3.1 Data-Set and Establishment Characteristics

(See Chapter 5 - 5.3.1)

6.3.2 Test Variables

6.3.2.1 Task Control and Two-Way Information Sharing

By looking at the frequency of replies to question 4, Centralization, it is possible to identify one high employee control variable, question 14. Exhibit 6.1, found in the appendix, is the question used to determine whether, and to what extent, shopfloor workers have control over job tasks. The frequencies are determined using the first round of interviews conducted between 1992 and 1994.

The establishment is considered to have a high degree of two-way communication if it has a suggestion plan in place and also if management meet a minimum of once per week with shopfloor workers (exhibit 6.2 in the appendix).

Table 6.1 is the frequency distribution in which operators have control or authority to act on their own information without having to wait for authorization from above. Initially checking to verify that all the establishments do actually have operators, which they do, we see that only in question 14, relating to quality, do a reasonable amount of establishments allow shopfloor workers the authority to act without having to wait for authorization. As covered in Chapter 5, 85 per cent of those interviewed believed their establishment had undergone a change towards greater decentralization of decision-making. It is clear from table 6.1 that they still have some way to go. There may be a number of reasons for this, including the possibility that additional training costs may make it costly to efficiently transfer these decisions to front-line employees. It may also be that managers have greater analytical abilities which allow them to make better decisions or that some decisions are most efficiently made by management and others by line workers. The data allows us to test to see who is in a better position to make decisions regarding product quality.

Table 6.1

Frequency Distribution for Operator having

Authority to take Action without Waiting for Authorization from Above

Question	Percent
Centrl1 - Operator	0
Centrl2 - Operator	2
Centrl3 - Operator	1
Centrl4 - Operator	1.1
Centrl5 - Operator	2.1
Centrl6 - Operator	5.5
Centrl7 - Operator	0
Centrl8 - Operator	1.8
Centrl9 - Operator	2
Centrl10 - Operator	0
Centrl11 - Operator	.90
Centrl12 - Operator	0
Centrl13 - Operator	7.2
Centrl14 - Operator	53.5

6.3.2.2 Measurement of Task Involvement/Responsibility and Group Incentives

According to Levine and Tyson (1990), there are three predominate types of participation including: Representative, Consultative and Substantive. Representative participation would include participation which consists of employees serving on boards or some other formal representation in which employees are able to express their views. The second type of participation is consultative, which is similar to representative in that employees are given the opportunity to give input into the work process, though not through formal means such as boards. The final type of participation is substantive, which is similar to consultative, however, there is a difference in degree. In substantive participation, employees are more likely to have control over

the work process and able to have a direct impact on their work life. Decentralizing control over tasks associated with quality, may be a good example of 'substantive' participation.

Given that there is limited actual control given to front-line employees, a second questionnaire question is used to evaluate the level of involvement employees have in various tasks. The question used is found in section G, Work Design (exhibit 6.3 in the appendix). Three types of involvement and responsibility are identified: these are labelled after their fundamental emphasis - type 1 is labelled (*Quality*), type 2 is labelled (*Set-Up*), type 3 is called (*Maintenance*).[5]

In order to further strengthen the legitimacy of this measure of employee involvement I evaluate how well the quality 'involvement' measure is correlated with the more concrete measure of employee quality 'control'. There is a .82 correlation between the establishments which allow shopfloor worker's control over quality issues and those who have a high degree of employee involvement in quality related issues. This fact strengthens the validity of both measures of involvement and also gives support to the legitimacy of the other measures of employee involvement. The questionnaire item used for group incentive schemes is found in the appendix, exhibit 6.4. If the establishment pays a profit-sharing or company bonus payment (question f. or g.) the establishment is considered to have a group incentive scheme.

[5] More detail on the definition and development of this variable is found in exhibit 6.5 in the appendix.

6.3.2.3 Dependent Variables, Estimation Model and Analysis Technique and Control Variables (See Chapter 5 - 5.3.4, 5.3.5, 5.3.6)

The two specifications used for the Cobb-Douglas production function include the following:

(1) $Perf = a + b_1 * HR + b_2 * Competition + b_3 * \ln(L) + b_4 * \ln(K) + b_5 *$(industry dummies) $+ b_6 *$ (year dummies) $+ e$

Where Perf = ln(sales/employee)

HR = dummy variable for employee involvement or group incentives or the interaction of the two

Competition = dummy variable if there is a 'high' degree of product market competition

ln(L) = ln(number of employees)

ln(K) = ln(assets)

e = error term assumed normally distributed i.i.d.

a, bi = coefficients

Also evaluated is the change in performance in time (t-1). The specification is the following:

(2) $Perf_{t-1} = a + b_1 * HR_{t-1} + b_2 * Competition_{t-1} + b_3 * \ln(L)_{t-1} + b_4 * \ln(K)_{t-1} + b_5$ *(industry dummies) $+ b_6 *$ (year dummies) $+ e_{t-1}$

6.4 Results

6.4.1 Descriptive Statistic and Correlation Analysis

6.4.1.1 Decentralized Decision-Making and Employee Involvement - Correlations

Variable definitions can be found in table 6.3. In table 6.2, a number of statistically significant correlations are identified. The financial measures will be more thoroughly dealt with when discussing the regression analysis. Starting firstly with the multi-skilling variable, we see that there is a negative relationship with unionization and a strong positive relationship with the two-way communication variable. Given union bias towards specialization and formalized job structures this is not unexpected. It is also not surprising that we would find (.23) a strong relationship between multi-skilling and two-way communication. Firms which invest in training that gives its workforce a high level of discretion over the work process would be expected to have communication mechanisms in place either to monitor or direct the work of employees. With unionization there is a strong negative relationship (-.16) with the existence of an integrated strategic planning process.

There is a strong positive effect associated with unionization and the size of the establishment (.17) and the presence of a union and the involvement of employees in the work process associated with machine set-up (.18). It is well documented that larger establishments tend to be unionized and we would expect more vertical integration of tasks in a unionized establishment. It is not surprising to find a relationship between a strategic planning process and a formal communication process (.12). There is also a strong relationship between a formal communication process and

control over quality issues (.19). This may reflect the fact that both are associated with the existence of, for example, a formal quality initiative such as TQM. There is a strong result associated with the strategy variable, including a positive relationship with both the size of the establishment (.11) and asset per employee (.21). The conclusion drawn from this is that larger facilities are more prone to use a formal planning process.

There are somewhat contradictory findings associated with the various task involvement and a formal planning process. There is a significant negative relationship for task control for quality (-.15), involvement in quality (-.11) and involvement in the order of tasks (-.16). There is, however, a positive relationship with involvement in maintaining machines (.16) and for those establishments which have an overall high degree of employee task involvement (.12). Apparently, there is a relationship between establishments that have strategic planning processes and overall involvement but not certain specific tasks. Regarding the relationship to the size of the establishment, there is a strong positive relationship with assets (.42), which we would expect, however, a strong negative association with all the task control and involvement variables. We see an identical relationship with the size of the assets and the establishment. Apparently, smaller establishments are more likely to use various types of involvement and employee control over the work process. Finally, as we expect, we see a strong positive relationships between the various types of involvement with one another.

Table 6.2

Correlations Matrix

Variables	1	2	3	4	5	6	7	8	9	10	11
1. ROA											
2. ROS	.55										
3. MultSkill	.16	-.02									
4. Union	.17	-.12	-.10								
5. InfoShare	.01	.00	.23	-.06							
6. Strategy	.02	.09	.07	.16	.12						
7. LogEstSize	.03	.04	-.13	.17	.07	.11					
8. LogAssts	.04	.01	.04	.05	-.01	.21	.42				
9. QrtlQual	-.02	.10	.06	.08	.19	.15	-.17	-.13			
10. InvQual	-.03	-.10	.05	.04	.09	.11	-.19	-.18	.60		
11. InvMain	-.07	-.06	.12	.07	.00	.16	-.15	-.16	.06	.12	
12. InvSetup	-.06	-.14	.11	.18	.04	-.16	-.23	-.26	.20	.20	.33

(n = 181)

All correlations = > .10 are significant at the .10 level, those > =.12 at the .05 level, those = > .16 at the .01 level, those = >.23 at the .0001 level.

6.4.1.2 Means - Employee Involvement

In table 6.4 we see that the descriptive statistics reveal that, nearly all the establishments which

have a high level of decision-making and involvement, but do not include incentives, also have less than average ROA and ROS. With the exception of those establishments that have a high degree of employee involvement in maintenance issues, which may reflect the smaller sample size, the high involvement, but no incentive establishments, have less strategic planning going on than the average establishment. Researchers often assume that involvement practices are normally part of a larger set of 'progressive' practices which would normally include a strategic planning process. It appears from this sample that is not necessarily the case.

These establishments use a greater amount of formal two-way communication devices than the average establishment. This is expected, given that we would expect management to want to keep informed about the types of actions which employees are taking. In general, these establishments are also more likely to be unionized. This higher level of unionization in high involvement establishments may reflect the greater level of representation found in unionized firms. As we would expect, establishments which have a greater degree of participation also conduct more multi-skilling than the average establishment. If employees are going to be given an increased level of responsibility and involvement in work tasks we would expect them to receive a greater level of multi-skilled training. These establishments are slightly smaller than the average establishment and on average have a smaller amount of assets. Finally, it appears engineering firms are more likely to use these types of programmes than the average establishment. Engineering may use form of technology, hire high-skilled workers and use the work practices which have the scope necessary to most greatly benefit from high levels of worker involvement.

6.4.1.3 Variable Means and Standard Deviations for the Combined Practices

In table 6.5 we see that establishments with profit-sharing programmes, and profit-sharing combined with task control, are less unionized. The fact that these practices are found in establishments which tend not to be unionized may be because they provide a substitute for unionization. We know that one of the principal benefits of unionization is the information-sharing mechanism which facilitates exchange of information between labour and management. Sharing in residual control and returns may well provide both the vehicle and the incentive to communicate the efficiency-enhancing information which labour is privy to. Some further support for this is the low level of two-way communication (InfoShare) found in establishments which have group incentives (.11). We see that, with the exception of the control establishments, most of the establishments use a strategic planning process to a similar degree. As we would expect to see, those establishments which have higher levels of task control also are more likely to use multi-skilling (Contrlgi, .70; Control, .51).

In terms of the types of organisations which use high levels of worker process control and group incentives, engineering and electronic manufacturing use them to a greater degree, on average. Plastic manufacturers use group incentives to a reduced degree, however, they use shopfloor worker process control approximately the same on average as other establishments. Food and drink manufacturers use group incentives slightly more on average, however, they use little shopfloor worker control. Food and drink manufactures typically have lower skill level workers which may indicate that these establishments have less to gain from giving employees control over some aspect of the work process. Work process control would only benefit organisations where there is latitude for individual judgement and action in the work process, and where shopfloor

workers are in a better position to make work-related task decisions than supervisors or managers. If the work process is highly standardized, a high level of employee discretion may be unnecessary.

6.4.2 Regression Analysis

6.4.2.1 Analysis for Employee Involvement Programmes

Starting first with the regressions in table 6.6 we see the impact which employee involvement, including financial incentives, has on establishment performance. In column (1) we see the impact which employee involvement, including two-way communication programmes, has on return on assets (ROA) when each of the independent variables are run individually. In the case of involvement in quality issues there is a significant impact on establishment performance at the 10 per cent level. In the case of involvement in both maintenance and the order of the work process there are negative coefficients and, again, a positive coefficient with control over quality tasks. There is, however, no effect associated with the two-way communication variable. In column (2) all the independent variables are included in the regression, but while the results are broadly the same the involvement in quality issues in no longer significant. In column (2) we see that the results of the other control variables are largely as we would expect.

The presence of a union results in reduced return on assets significant at the 5 per cent level. We also see that multi-skilling has a positive impact on performance at the 10 per cent level. The union result is expected and consistent with previous findings associated with the impact of unionization on firm financial performance. I am not aware of any previous work having been

done on the impact of multi-skilling on establishment performance and this result indicates that there are gains associated with firms investing in this type of work process and training. Finally, neither strategic planning nor two-way communication has any impact on establishment performance. Column (3) examines the individual effects of the various independent variables on return on sales (ROS). We see that involvement in quality matters and control over quality tasks are significant at the 5 per cent and 10 per cent levels respectively, and again no effect associated with two-way communication programmes. Running all the independent variables together in column (4) results, again, in similar results, without statistical significance. Looking next at table 6.7, we see that in the case of columns (1-4) there are no significant results in any of the independent variables for either ROA or ROS when establishments which include group-based incentives are removed from the analysis. This may indicate that previous studies which evaluate the impact of 'employee involvement', without controlling for the effects of financial participation, such as profit-sharing or company wide bonuses, may have biassed results.

6.4.2.2 Combined Practices - Regression Results

Tables 6.8 presents the results of a regression using OLS which evaluates the impact on performance of shopfloor worker control over quality issues in the production process and group incentive schemes independently and combined. Reviewing the results associated with return on assets in column (1), in time (t) and column (2) the independent and control variables in time (t-1) and return on sales in time t column (3) and (t-1) in column (4) as a measure of establishment performance, we see that the combination of the practices results in a positive significant effect at the one per cent level in both time (t) and (t-1). We see the results are the same in column (5) which is the restricted sample of establishments in time (t-1) where there is a 'very high' degree

of interdependence between work areas. This result remains the same in column (6) which uses the 'unextended' data-set. This result supports the hypothesis that the interaction effect of the practices elicits strong performance outcomes.

We see that group incentive schemes in isolation are significant at the one per cent level for ROA. As detailed in the theoretical overview there are conflicting dynamics at work when profit-sharing is used in isolation, however, there seems to be some evidence that there are positive performance outcomes. Also noted is that while the coefficients are positive, where control rights are used in isolation, they are not statistically significant. The fact that there is no significant effect associated with a high degree of task involvement, when used in isolation, also supports the theory that moral hazard will have the dominate effect when employee involvement is used without any incentives. We see that multi-skilling is significant at the five percent level for ROA. This result signals that there are performance effects associated with training the workforce in a variety of tasks rather than relying on specialized job functions. The presence of a union has a negative impact on financial performance and is significant at the one per cent level for ROA. This result on unions is in line with much of the other research which shows a negative association with unions and financial performance. In table 6.9, which uses the more efficient random effects model, and controls for the remaining unobserved heterogeneity not controlled for by the control variables, we see that group incentives on their own are no longer significant. However, for both ROA and ROS in times (t) and (t-1) the interaction variable is significant mostly at the 1 per cent level.

Taking the results from table 6.9, column (1) we see that establishments which use *both* decentralized decision-making and group incentives have 11 per cent higher return on assets and a 4 per cent higher return on sales than those establishments which use neither practice. The

results in column (5) indicate establishments which have a high degree of interdependence between work areas have a 13 per cent greater return on assets if they use the combined practices. Once again, this result does not change when using the 'unextended' data used to generate the coefficients in column (6).

Table 6.10 presents the results associated with the labour productivity analysis. The higher levels of productivity are associated with the use of group incentives rather than either the use of employee involvement or the combination of the two. Column one, which is the entire data-set, in time t we see establishments with some form of group incentive have labour productivity which is 0.09 (8.6 %) log-points higher than those without. We see roughly the same result when we evaluate the performance effects in time t - 1 (0.10 log-points; 9.5 %).

An example of two establishments, one using both decentralized decision making and group incentives and the other uses just decentralized decision making. Using Table 6.9 column 1, Establishment 1 uses control and return rights in combination and Establishment 2 uses only decentralized decision making. Establishment 1 has a 6% (11% - 5%) better return on assets than does establishment 2. When we factor in the intercept (11% in column 1, table 6.9) those establishments which use control and return rights in combination have 22% (11% + 11%) return on assets, and those who use only control rights have 16% return on assets (5% + 11%).

While the intercept was not reported in column 5 because each reported coefficient and standard error is derived from independently run regressions, the approximate level was between 11 and 12 percent. These results suggest that the establishments which *do not* use these payment systems have between 11 and 12 percent return on assets. The gains associated with the use of these

payment systems, as detailed in this analysis, are *in addition* to these average levels. For example, comparing establishment 1 and establishment 2 to the average establishment which does not use these payment systems (establishment 3) would result in the following return on asset level: establishment 3, 12%, establishment 2, 7% (12% - 5%) and establishment 1, 28% (12% + 16%)

6.5 Conclusion

Evaluated in this chapter is the independent and interactive effects of group incentives and decentralized decision-making. Decentralized decision-making is seen as a practice which may signal to employees that their input is valued. This type of practice may help promote the type of 'co-operative' culture thought to be needed in order to counter the incentive diluting effects of the free-rider problem.

The work process was primarily an 'interdependent' production process (75 per cent) where one area was dependent on the others in order to carry out its work. A team approach was used in 84 per cent of the establishments and the majority of those interviewed believed their establishment was moving towards greater decentralization (85 per cent).

This chapter firstly evaluates the impact employee involvement practices, with and without incentives, have on the financial performance of the establishment. Secondly, it looks at the impact a high degree of decentralized task responsibility interacted with group incentive programmes has on establishment performance outcomes.

We see that in the case where incentives are included with employee involvement programmes, including two-way communication programmes and decentralized decision-making, there may be

a significant impact on the financial performance of the establishment. When a further evaluation is conducted, which does not include incentives, we see that the significant impact on the performance of the establishment no longer applies.

Also evaluated is the impact that a high degree of employee control over a specific job task and group incentives, both independently and interactively, have on the financial performance of the establishment. We see that, when used in isolation, a high degree decentralized decision-making does not have a significant impact on performance. Group incentives do have a significant positive impact on financial performance and labour productivity, but the strongest impact on financial performance is associated with the combination of these practices.

These findings provide some evidence that transferring residual control and residual return rights lead to greater profitability when used in combination. These results also hold-up in a restricted sample of establishments which have a 'high' degree of work area interdependence. Using two identifiable practices we see that the two practices used in combination result in superior outcomes than if taken in isolation. These results remain robust after both attributing for unobserved heterogeneity, through the use of the random effects estimator, and attempts to mitigate the potential for endogeneity through the use of lag variables. The evidence provided in this chapter suggests that decentralizing decision-making is not enough, group incentives also need to be provided.

Table 6.3

Variable Definition

Variable	Definition
ROA	Pre-tax profit divided by assets.
ROS	Pre-tax profit divided by total establishment sales.
InvQual	1 if the shopfloor workers are very involved in quality matters and may include incentives, 0 otherwise.
InvMain	1 if the shopfloor workers are very involved in maintenance issues and may include incentives, 0 otherwise.
InvOrder	1 if the shopfloor workers are very involved in the order in which the work is carried out and may have incentives, 0 otherwise.
CrtlQual	1 if the shopfloor workers have control over quality tasks and may include incentives, 0 otherwise.
InvQual2	1 if the shopfloor workers are very involved in quality matters excluding any incentives, 0 otherwise.
InvMain2	1 if the shopfloor workers are very involved in maintenance issues excluding any incentives, 0 otherwise.
InvOrder2	1 if the shopfloor workers are very involved in the order in which the work is carried out excluding any incentives, 0 otherwise.
CrtlQual2	1 if the shopfloor workers have control over quality tasks excluding any incentives, 0 otherwise.
ContrlGI	1 if the establishment has a combination of worker quality task control and group incentive schemes, 0 otherwise.
Grouppay	1 if the establishment has no shopfloor worker quality task control and a group incentive scheme, 0 otherwise.
Control	if the establishment has shopfloor worker quality task control and no group incentive schemes, 0 otherwise.

Variable Definitions cont'd

InfoShare	1 if the establishment has a high level of Mgmt>Employee Employee>Mgmt communication, 0 otherwise.
Union	1 if the establishment has a union, 0 otherwise.
Multi-Skill	1 if the establishment uses multi-skill training, 0 otherwise.
IndustComp	1 if the level of competition in the industry has increased in the last 5 years.
Strategy	1 if the establishment has a functionally integrated strategic planning process.
EstSize	Average number of employees in year t.
LogEstSize	Log of the average number of employees in year t.
Assets	Gross book value of depreciable assets.
LogAssets	Log of gross book value of depreciable assets.

Year in which interview took place and sector dummies also included in regressions.

Table 6.4

Variable Means and Standard Deviations by Task Control/Task Employee Involvement (Variable Information for Pooled Data)

Variable	InvQual (103)		InvMain (24)		InvOrder (101)		CrtlQual (107)		Total (397)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
ROA	.11	.12	.09	.08	.10	.10	.12	.13	.12	.14
ROS	.04	.04	.03	.03	.03	.04	.06	.11	.06	.09
Strategy	.61	.49	.96	.20	.57	.50	.59	.50	.70	.46
Union	.63	.48	.75	.44	.75	.43	.66	.48	.60	.49
InfoShare	.27	.45	.21	.42	.24	.43	.34	.48	.21	.41
MultiSkill	.50	.50	.71	.46	.55	.50	.51	.50	.46	.50
EstSize	264	270	196	197	260	267	238	252	325	467
LogEstSize	5.0	.72	4.9	.75	4.9	.63	5.2	.73	5.3	.83
Assets (000)	70	357	81	245	47	232	75	383	60	321
LogAssets	8.1	1.6	7.7	1.2	7.9	.9	8.7	1.8	8.8	1.8
Eng	.61	.49	.92	.28	.56	.50	.53	.50	.45	.50
Ele	.07	.25	.08	.28	.01	.10	.07	.25	.08	.27
Plast	.22	.42	0	0	.17	.38	.28	.45	.23	.41
FandD	.04	.19	0	0	.15	.36	.04	.19	.10	.30
Misc	.07	.25	0	0	.11	.31	.08	.28	.17	.37

Table 6.5

Variable Means and Standard Deviations by Task Control/Group Incentive Schemes (Variable Information for Pooled Data)

Variable	ContrlGI (81)		Grouppay (72)		Control (107)		NoCtrlNoGi (137)		Total (397)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
ROA	.14	.17	.13	.11	.12	.13	.10	.12	.12	.14
ROS	.06	.06	.06	.07	.06	.11	.04	.05	.06	.09
Est Size	294	305	256	268	238	252	367	585	325	467
LogEstSize	5.3	.77	5.4	.76	5.2	.73	5.4	.91	5.3	.83
Union	.52	.50	.53	.50	.66	.48	.63	.48	.60	.49
InfoShare	.26	.44	.11	.32	.34	.48	.13	.34	.21	.41
MultiSkill	.70	.46	.25	.44	.51	.50	.38	.49	.46	.50
Assets (000)	57	214	47	197	75	383	68	316	60	321
LogAssets	8.8	1.7	9.2	1.9	8.7	1.8	8.6	1.7	8.8	1.8
Eng	.50	.50	.28	.45	.53	.50	.42	.50	.45	.50
Ele	.12	.33	.18	.39	.07	.25	0	0	.08	.27
Plast	.21	.41	.08	.28	.28	.45	.25	.43	.23	.41
FandD	0	0	.19	.40	.04	.19	.15	.36	.10	.30
Misc	.17	.38	.26	.44	.08	.28	.19	.39	.17	.37

Table 6.6

Random Effects Estimates of (Return on Assets and Return on Sales) for UK Manufacturing Establishments Shopfloor Worker Employee Involvement Programmes *including incentives.* (Standard Errors in Parentheses.)

Variables	1	2	3	4
InvQual	.05*	.04	.03**	.03
	(.03)	(.06)	(.01)	(.03)
InvMain	-.06	-.07	-.03	-.03
	(.05)	(.05)	(.02)	(.02)
InvOrder	-.004	-.01	.004	.004
	(.03)	(.04)	(.01)	(.02)
CrtlQual	.05	.03	.02*	.003
	(.03)	(.07)	(.01)	(.03)
InfoShare	-.004	-.03	.01	.00
	(.04)	(.04)	(.02)	(.02)
Union	———	-.06**	———	-.02
		(.03)		(.01)
MultiSkill	———	.06*	———	.02*
		(.03)		(.01)
Strategy	———	-.03	———	.002
		(.04)		(.01)
LogEstSize	———	.02	———	.004
		(.02)		(.01)
LogAssets	———	———	———	.004
				(.01)
Intercept	———	.13	———	.02
		(.12)		(.05)
$\bar{R}2$	———	.22	———	.19
N	———	183	———	181

Column (1), Regression includes various task involvement + controls (controls not reported) using ROA.
Column (2), Regression includes all task involvement + controls using ROA.
Column (3), Regression includes various task involvement + controls (controls not reported) using ROS.
Column (4), Regression includes all task involvement + controls using ROS.
*Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.
Note: Sector and year in which interview conducted dummies included in the regression but not reported.

Table 6.7

Random Effects Estimates of (Return on Assets and Return on Sales) for UK Manufacturing Establishments Shopfloor Worker Employee Involvement Programmes *absent incentives.* (Standard Errors in Parentheses.)

Variables	1	2	3	4
InvQual2	.01 (.04)	.04 (.06)	.00 (.02)	.01 (.02)
InvMain2	-.02 (.08)	-.01 (.09)	-.02 (.03)	-.001 (.04)
InvOrder2	-.02 (.04)	-.03 (.05)	-.02 (.02)	-.03 (.02)
CrtlQual2	-.01 (.04)	-.03 (.05)	-.001 (.01)	-.003 (.02)
InfoShare	-.004 (.04)	-.003 (.04)	.01 (.02)	.01 (.02)
Union	———	-.06** (.03)	———	-.02 (.01)
MultiSkill	———	.08** (.03)	———	.03** (.01)
Strategy	———	-.03 (.04)	———	-.01 (.01)
LogEstSize	———	.02 (.02)	———	.003 (.01)
LogAssets	———	———	———	.00 (.01)
Intercept	———	.17 (.13)	———	.06 (.05)
$\bar{R}2$	———	.17	———	.13
N	———	183	———	181

Column (1), Regression includes various task involvement + controls (controls not reported) using ROA.
Column (2), Regression includes all task involvement + controls using ROA.
Column (3), Regression includes various task involvement + controls (controls not reported) using ROS.
Column (4), Regression includes all task involvement + controls using ROS.
*Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.
Note: Sector and year in which interview conducted dummies included in the regression but not reported.

Table 6.8

OLS Estimates of Return on Assets and Return on Sales for UK Manufacturing Establishments. Shopfloor Worker Task Control (Quality), Group Incentive Schemes, Independently and Combined. (Standard Errors in Parentheses.)

Variables	1 (t)	2 (t-1)	3 (t)	4 (t-1)	5 (t-1)	6 (t)
Control	.04* (.02)	.03 (.04)	.02* (.01)	.02* (.01)	.04 (.03)	.06 (.05)
Grouppay	.07*** (.03)	.07*** (.03)	.03* (.02)	.03** (.02)	.07* (.04)	.05 (.06)
ContrlGI	.10*** (.03)	.10*** (.04)	.04*** (.01)	.04*** (.01)	.14*** (.04)	.09** (.04)
InfoShare	-.02 (.03)	-.004 (.03)	.01 (.01)	.01 (.01)	-.01 (.04)	-.02 (.04)
Union	-.06*** (.02)	-.05** (.03)	-.01* (.008)	-.01 (.01)	-.05 (.02)	-.05 (.03)
MultiSkill	.05** (.02)	.05** (.03)	.02** (.01)	.02** (.01)	.06** (.03)	.07** (.03)
Strategy	-.01 (.02)	-.03 (.02)	-.0003 (.01)	-.0001 (.01)	-.03 (.03)	-.01 (.04)
LogEstSize	.01 (.03)	.02 (.01)	.004 (.004)	.01 (.006)	.01 (.01)	.01 (.02)
LogAssets	———	———	-.0001 (.004)	-.006** (.003)	———	———
Intercept	.12 (.09)	.07 (.10)	.03 (.03)	.03 (.04)	.14 (.11)	.17 (.12)
$\bar{R}2$	.15	.13	.10	.10	.12	.12
N	178	141	178	141	114	103

Column (1), Regression includes independent variables + controls using ROA in time t.
Column (2), Regression includes independent variables + controls using ROA in time t -1.
Column (3), Regression includes independent variables + controls using ROS in time t.
Column (4), Regression includes independent variables + controls using ROS in time t -1.
Column (5), Regression includes independent variables + controls using ROA in time t - 1 for 'restricted' sample.
Column (6), Regression includes independent variables + controls using ROA in time t - 1 for 'restricted' sample using 'unextended' data-set.
*Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.
Note: Sector and year in which interview conducted dummies included in the regression but not reported.

Table 6.9

Random Effect Estimates of Return on Assets and Return on Sales for UK Manufacturing Establishments. Shopfloor Worker Task Control (Quality), Group Incentive Schemes, Independently and Combined. (Standard Errors in Parentheses.)

Variables	1 (t)	2 (t-1)	3 (t)	4 (t-1)	5 (t-1)	6 (t)
Control	.05 (.04)	.03 (.04)	.02 (.02)	.02 (.02)	.04 (.05)	.06 (.05)
Grouppay	.09* (.05)	.06 (.06)	.03 (.02)	.03 (.02)	.07 (.08)	.07 (.08)
ContrlGI	.11*** (.04)	.10** (.05)	.04*** (.02)	.05*** (.02)	.13** (.06)	.11** (.05)
InfoShare	-.02 (.04)	-.004 (.04)	.01 (.02)	.01 (.02)	-.01 (.05)	-.03 (.05)
Union	-.06** (.03)	-.06* (.03)	-.02 (.01)	-.01 (.01)	-.05 (.04)	-.06* (.04)
MultiSkill	.06* (.03)	.06* (.03)	.02 (.01)	.02* (.01)	.06 (.04)	.08** (.04)
Strategy	-.01 (.03)	-.03 (.04)	.0004 (.01)	.001 (.01)	-.03 (.05)	-.03 (.04)
LogEstSize	.02 (.02)	.02 (.02)	.004 (.01)	.01 (.01)	.01 (.02)	.01 (.02)
LogAssets	———	———	-.0003 (.003)	-.008 (004)	———	———
Intercept	.11 (.12)	.07 (.13)	.03 (.05)	.04 (.05)	.12 (.16)	.08 (.08)
$\bar{R}2$	.22	.21	.17	.19	.23	.24
N	178	141	178	141	114	103

Column (1), Regression includes independent variables + controls using ROA in time t.
Column (2), Regression includes independent variables + controls using ROA in time t -1.
Column (3), Regression includes independent variables + controls using ROS in time t.
Column (4), Regression includes independent variables + controls using ROS in time t -1.
Column (5), Regression includes independent variables + controls using ROA in time t - 1 for 'restricted' sample.
Column (6), Regression includes independent variables + controls using ROA in time t - 1 for 'restricted' sample using 'unextended' data-set.
*Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.
Note: Sector and year in which interview conducted dummies included in the regression but not reported.

Table 6.10

Random Effect Estimates for Labour Productivity (LogSalesEE) for UK Manufacturing Establishments. Shopfloor Worker Task Control (Quality), Group Incentive Schemes, Independently and Combined. (Standard Errors in Parentheses.)

Variables	1 (t)	2 (t)	3 (t-1)	4 (t-1)
Control	.01 (.04)	.01 (.05)	.00 (.04)	.00 (.04)
Grouppay	.09** (.05)	.09 (.07)	.10** (.05)	.10** (.05)
ContrlGI	.01 (.04)	-.03 (.05)	.01 (.04)	.01 (.04)
IncComp	.02 (.03)	.04 (.04)	.02 (.03)	.02 (.03)
LogEstSize	-.16*** (.02)	-.16*** (.02)	-.16*** (.02)	-.16*** (.02)
LogAsstEE	.01 (.03)	-.01 (.03)	.02 (04)	.02 (.02)
Intercept	2.66*** (.13)	2.70*** (.15)	2.63*** (.15)	2.63*** (.15)
$\bar{R}2$	.57	.59	.55	.56
N	204	144	155	111

Column (1), Regression in time t.
Column (2), Regression in time t for restricted sample of 'team production' settings.
Column (3), Regression in time t - 1.
Column (4), Regression in time t - 1 for restricted sample of 'team production' settings.

**Statistically significant at the .05 level; ***at the .01 level.
Note: Sector and year in which interview conducted dummies included in the regression but not reported.

6.6 Appendix

Exhibit 6.1

Questionnaire Items for Independent Variables

4. Centralization

Which is the lowest level in the firm which has the authority to make decisions?
(action can be taken without waiting for confirmation from above)

(i) Spend unbudgeted money on capital expenditure items
(ii) Spend unbudgeted money on current revenue items
(iii) Create a new job
(iv) Determine a new product
(v) Determine the pricing of a product
(vi) Determine the size of the labour force
(vii) Dismiss an operator
(viii) Decide which production plans are to be given preference
(ix) Which suppliers are to be used (including changes)
(x) Whether to promote an operator
(xi) Selection of an applicant
(xii) When overtime should be worked
(xiii) Allocation of work amongst available operators
(xiv) Stopping production because of quality problems
(xv) Which of these 6 levels exists (Y)
(N)

Operator	Super-visor	Mgr	Mgr Reporting to MD	MD	Above MD
1	2	3	4	5	6

Exhibit 6.2

Two-Way Communication Variable Questionnaire Item

N. Research and Development 7. Communication

How often are there:

(ii) written/verbal briefing on company performance or other company issues to management?
never/daily/weekly(bi)/monthly(bi)/quart/6mos /annual

10. Does the company have any schemes for promoting innovation (e.g. a suggestion scheme)?

(i) Yes [ ]
(ii) No [ ]

Exhibit 6.3

Task Responsibility Questionnaire Item

G. WORK DESIGN

11. To what extent are operators responsible for/involved in the following:

		Not at all	A little	Moderate Amount	Very Much
(i)	A significant quality problem.	1	2	3	4
(ii)	Material supply problem.	1	2	3	4
(iii)	Machine repair following minor breakdown.	1	2	3	4
(iv)	Routine maintenance of machine.	1	2	3	4
(v)	Setting up machine for changeover of product.	1	2	3	4
(vi)	Setting up the machine for a new product.	1	2	3	4
(vii)	When to take breaks.	1	2	3	4
(viii)	The order in which to do their work.	1	2	3	4

Exhibit 6.4

Pay System Questionnaire Item

8. Reward

(ii) On what basis are shopfloor workers paid? (tick all those that apply)

a.	Flat time rate	[ ]
b.	Output incentive/bonus (individual)	[ ]
c.	Output incentive/bonus (team)	[ ]
d.	Merit rating	[ ]
e.	Measured day work	[ ]
f.	Company profit share	[ ]
g.	Company bonus	[ ]
h.	Salaried	[ ]

Exhibit 6.5

Frequency Distribution for Involvement/Participation Definition

Using a frequency distribution establishments with the factors are represented depending on frequency of the various factors. Table 6.10 through 6.12 represents the first two questions which comprise type 1 (Quality), (Table 6.10). Using question (i) and (ii) found in exhibit 6.2 an establishment is considered to have a high degree of shopfloor worker involvement/responsibility if the response to *either* question (i) or question (ii) is "Very much". The same determination is made for type 2 (Set-up) if the reply to either (v) or (vi) is very much (Table 6.10), and Factor 3 (Maintenance) if the reply to either question (iii) or (vi) is very much (Table 13.0).

Type 1 (Quality)
Table 6.10
Frequency Distribution for Question from diagram 3 (i) and (ii).

Question Extent operators involved/responsible for following: "Very much"	Frequency	Percent
(i) Roqual	32	28.83
(ii) Romat	11	9.91

Type 2 (Set-Up)
Table 6.11
Frequency Distribution for Question from diagram 3 (v) and (vi).

Question Extent operators involved/responsible for following: "Very much"	Frequency	Percent
(v) Roset	50	46.30
(vi) Ronew	34	32.08

Type 3 (Maintenance)
Table 6.12
Frequency Distribution for Question from Diagram 3 (iii) and (iv).

Question Extent operators involved/responsible for following: "Very much"	Frequency	Percent
(iii) Rorep	7	6.54
(iv) Romaint	11	10.19

6.6.3 Questionnaire Items Used for Control Variables (See Chapter 5 - 5.6.2)

Chapter 7

Summary and Conclusion

7.1 Introduction

In Chapter 7, I will summarize the chapters, respond to the questions addressed and also discuss the conclusions which can be drawn from this thesis.

The questions evaluated include the following:

(i) From the perspective of the company, why would it choose to use group incentives and employee involvement programmes? What would it hope to gain and does the firms performance change after the introduction of these programmes? How well is it performing in relation to firms which do not use such these programmes?

(ii) What form of pay system promotes optimal establishment outcomes? In team production settings, are individual, team or group incentives most efficient?

(iii) In settings where the product produced or the service given is dependent on team production or interdependent work processes, is it efficient for establishments to invest in decentralized decision-making and communication programmes? Is it efficient to use employee involvement and performance-related pay independently, or rather in combination?

Initially, in Chapter 7, I will summarize the findings in each chapter. This will be followed by an evaluation of the conclusions which can be drawn regarding these test questions.

7.2 Summary

7.2.1 Chapter 1 - Introduction

Chapter 1 introduces the questions which will be evaluated and tested in this thesis. A number of concepts and trends are also introduced and discussed. Increased education levels, training, and increased access to information from information technology are all having the effect of giving employees access to private information. In addition, there is an increased trend in the use of both employee involvement programmes and incentive systems, which may be used as substitutes for formal monitors. These trends may signal that employers are finding it increasingly advantageous to involve employees, and that it may be getting more difficult to formally monitor their work.

7.2.2 Chapter 2 - Theoretical Considerations and Empirical Review

In the second chapter, theoretical considerations are evaluated and a review of the pertinent empirical literature is conducted. Additional theoretical issues and the related empirical work are discussed in the Chapters 4, 5 and 6 where the test questions are evaluated. The theoretical review starts with the principal-agent framework; the notion that owners and their agents may have differing objectives. In order to achieve 'goal convergence' employers develop incentive contracts. Incentive contracts focus on rewarding performance rather than observable behaviours such as time spent on the job. While there is both theoretical and empirical evidence that rewards based on performance illicit greater individual performance outcomes, there is little or no empirical evidence on which payment system is the most efficient in team production settings.

There is some theoretical evidence that group-based compensation systems may be more efficient in settings where there is a high degree of interdependence between work areas or work tasks. Evaluated in Chapter 2 are the incentive effects associated with both employee involvement and group incentives. One of the principal reasons employee involvement programmes are thought to be efficient is because employees have access to information which may be productivity-enhancing. Employee involvement programmes may allow 'owners' to gain access to this information. However, one problem with employee involvement is that unless incentives are provided, moral hazard and an increased opportunity to shirk may be present. Group incentives are thought to provide increased incentive effects, and these results may be particularly prevalent in settings where there is a high degree of work area 'interdependence'. The principal problem with group incentives is the 1/n or free-rider problem. Either adding monitors or finding substitutes for monitors is one means of resolving the free-rider problem. Consequently, there is some theoretical support for the position that employee involvement and group incentives may work better in combination. Incentives may resolve the moral hazard problem and employee involvement may promote the type of environment which encourages mutual monitoring and co-operation. There is some prior empirical support for greater efficiency when employee involvement and group incentives are used in combination.

7.2.3 Chapter 3 - Methodological Issues

In order to evaluate the questions raised in this thesis, both case study and econometric analysis is used. The case study allows for a broad analysis which provides insight into why a company would choose to put in place group incentives and employee involvement programmes. The case study is also able to provide information on broad performance trends associated with the use of

these programmes. Performance of the firm prior to, and after, the introduction of the all-employee stock option programme was evaluated, as was an examination of the performance of firms which do not have the same programmes. While it is not possible to infer these practices are *causing* changes in performance, the case study allowed us to see why, from the perspective of a single firm, it chose to put these practices in place.

In order to examine more rigorously the impact of pay systems and employee involvement, econometric analysis was used. To examine more closely the impact the practices of interest have on performance both heterogeneity and endogeneity is controlled for. In order to control for heterogeneity, or omitted variable bias, a broad range of control variables is also included. In addition, the random effects estimator is used. Endogeneity, or reverse causality, is partially mitigated through the use of lag variables.

7.2.4 Chapter 4 - AESOP and Communication Programmes in UK Retail Firm

A case study is conducted in Chapter 4 in order to broadly examine why a firm would chose to implement an all-employee stock option programme (AESOP) and extensive employee communication programmes. From the perspective of those at the retail firm, the reason the stock option programme was instituted was due to the belief that 'owners' would work harder, server the customer better, and be less likely to resign. Extensive communication programmes were instituted in order to gain access to information which employees may have.

Since the introduction of these programmes there has been an increase in performance measures, such as productivity and profitability, both within the firm and in comparison with competitors

who do not offer an AESOP. There is also a reduction in employee turnover, a high level of employee morale and extensive involvement by employees in involvement programmes.

These results clearly signal that a close look at both group incentive schemes and employee involvement programmes is warranted. In order to examine more closely the effects of these practices on performance, in Chapter 5 an econometric analysis is conducted on the effect of fixed and variable pay systems, including group incentives, on the performance of establishments. Chapter 6 is an econometric analysis of the independent and interactive effects of employee involvement and group incentives on establishment performance.

7.2.5 Chapter 5 - Fixed, Individual, Team and Group Pay in Team Production Settings

Examined in Chapter 5 is the impact on establishment financial performance of piece rates, individual merit pay, individual and team bonuses and group incentives. These pay systems are evaluated in UK manufacturing settings which have largely 'interdependent' work areas. There is some theoretical support that group-based pay systems may promote optimal performance outcomes in team production settings.

These pay systems are tested in both the entire sample of establishments which mostly have some degree of task 'interdependence' (96 per cent of the establishments) and a restricted sample of establishments which have a higher level of task interdependence (75 per cent of the establishments). The results clearly show that in work settings where there is task or work area interdependence, group incentives are more efficient than fixed pay, piece rates, individual or team level bonuses. This holds for the sample as a whole but is especially true in the restricted

sample of more highly task interdependent establishments.

7.2.6 Chapter 6 - Independent and Combined Employee Involvement Programme with Group Incentives

Chapter 6 examines both the independent and interactive effects of employee involvement and group incentives. A restricted sample is also used to evaluate these practices in settings where there is a high degree of task interdependence.

Initially examined is the impact which the use of employee involvement has on establishment performance. Both involvement in job tasks and the use of two-way information-sharing programmes are evaluated. Involvement associated with quality-related tasks are shown to be associated with superior performance. However, when establishments which include financial incentives are excluded from those which use employee involvement these results disappear.

Evaluated next in this chapter are performance effects in establishments which use *only* employee decentralized decision-making in quality related tasks and establishments which use *only* group-based incentives. By evaluating the use of these programmes independently I was better able to determine if the incentive effects are associated with employee involvement or group incentives. Additionally, the interactive effects of these two practices are also evaluated by evaluating the impact of these two practices in establishments which *only* use the combination.

The results clearly show that superior performance outcomes are found when these two practices are used in combination. The results remain robust in the restricted sample of establishments

with more highly interdependent work areas.

7.3 Test Questions Revisited

7.3.1 Test Question (i)

From the perspective of the company, why would it choose to use group incentives and employee involvement programmes? What would it hope to gain and does the firm's performance change after the introduction of these programmes? How well is it performing in relation to firms which do not use such programmes?

From the perspective of the case study company, the use of an all-employee stock option programme could result in employees thinking and acting like owners. This, it is envisaged, should translate into greater customer service, higher productivity and greater loyalty. The use of extensive employee involvement programmes is meant to tap the substantial expertise and information to which the employees have access.

The theoretical literature does not provide a clear prediction on the use of these practices. Group-based incentives are normally found in settings were it is difficult to monitor employees, and the decision to use employee involvement programmes are dependent on whether employees have access to useful information, the cost of communicating that information and the analytical expertise of employees. The theoretical literature would predict that if group incentives can overcome the incentive diluting effects of the free-rider problem, this form of payment system may result in greater output. Employee involvement programmes which tap into useful information, which employees have access, may also increase productivity.

The choice of a group-based incentive system in the 'low-wage, low-skill' service sector is interesting. Group-based incentives are typically associated with 'high-paid', 'high-skilled' employees, where monitoring output is considered to be costly. Monitoring costs for service sector workers may actually be high given the information which they have access to on customer preference and the difficulty in monitoring 'good customer service' or 'helpfulness'.

While it is difficult to establish causality from the case study used in Chapter 4, in all performance measures, the company is performing very well. Profits and productivity are increasing, there is a decrease in employee turnover and an apparently high level of employee morale. This increasing performance is taking place both within the case study firm and in comparison with its competitors which do not offer the same financial participation programmes.

7.3.2 Test Question (ii)

What form of pay system promotes optimal establishment outcomes? In team production settings, are individual, team or group incentives more efficient?

There has recently been a transition from manufacturing establishments in which the production process is primarily specialized and rigid, to workplaces which are characterized by flexibility. Associated with these changes in the production process, there have been some changes in payment systems from individual to team- or group-based. However, only approximately one-third of the establishments in our data-set are using these practices.

There is some theoretical support that group-based incentive systems might be more efficient in settings where output is a function of group effort or information-sharing between groups is valuable. In these settings, individual performance-based incentive systems may not promote the types of 'co-operative' behaviours and information sharing which are needed.

Using methods which attribute for both unobserved heterogeneity or omitted variable bias and endogeneity we find evidence in Chapter 5 that in team production settings group-based incentives are more efficient than incentive systems which reward either team or individual effort. The coefficients for both individual and team-based incentive systems are largely negative. When a restricted sample of establishments which have a 'high' degree of interdependence between work areas the same result is found.

7.3.3 Test Question (iii)

In settings where the product produced or the service given is dependent on team production or interdependent work processes, is it efficient for establishments to invest in decentralized decision-making and communication programmes? Is it efficient to use employee involvement and group incentives on their own, or rather in combination?

We have seen in Chapter 5 there is evidence that in production settings which have a high degree of interdependence between work areas, group-based incentive schemes are more efficient than individual or team-based approaches. However, there is still the free-rider or 1/n problem. There is speculation that the development of a 'co-operative' or 'trusting' corporate culture may be necessary for profit-sharing to have a maximum effect. This is tested in Chapter 6 by evaluating the performance of establishments which use profit-sharing and use practices which may help develop a 'co-operative' work culture.

There is also some theoretical support for the use of these two practices in combination. Given the impossibility of complete contracting, the use of 'implicit' contracts, which consist of an employer's effort to develop loyalty and co-operative behaviours in their workforce, may promote the trust necessary to take up where explicit contracts leave off. While theory may

support the use of practices which promote trust in the workplace to mitigate the free-rider problem, programmes which promote trust without incentives may be prone to moral hazard. For example, a high degree of decentralized decision-making may result in a reduction of output if incentives are not included. This may take place because employees may have the authority to act on their private information, but if they do not 'share in the returns', the incentive may be to shirk or reduce effort.

The empirical evidence in Chapter 6, indicates that previous research into employee involvement which has not separated out 'decision-making' from 'financial participation', may have biassed results. The empirical results in Chapter 6 shows that establishments which have financial participation *and* employee involvement may lead to inflated and biassed coefficients when evaluating the impact of employee involvement on performance.

Evidence in Chapter 6 shows that it is not decentralized decision-making or group incentive taken independently which result in superior performance, but rather the use of the two practices in combination. This same result applies in settings where there is a high degree of interdependence in the work areas.

7.4 Concluding Remarks

This thesis allows us to conclude that in today's workplace, it is most efficient for companies to share both residual control and residual return rights with their employees. It further allows us to conclude that while it is efficient to share these rights, it is most efficient if the rights are shared *together*.

As we saw in Chapter 1, private information exists with employees due to increased education levels, greater training information technology and emergence of the service economy. In chapter 4, the case study, this increase in private information may not only be limited to the highly-skilled, but given their proximity to customers, low-skilled employees may have access to useful information on customer preferences. Changes in the manufacturing sector are also increasing the skill levels of employees and the production process is changing from rigid to flexible methods which include a high degree of interdependence between work areas. These changes may be making it increasingly difficult and expensive for companies to monitor the work of employees so employers are looking for cost-efficient ways in which to monitor.

There is support in the theoretical literature that the two practices may work best when used in combination. Employee involvement on its own allows for the possibility of moral hazard and group incentives taken independently are subject to the free-rider problem. However, when taken together, group incentives may provide the incentive necessary to overcome the moral hazard problem, and the use of employee involvement programmes may help create the type of workplace culture which promotes horizontal monitoring, reducing the free-rider problem.

The case study provides evidence, from the perspective of the company, regarding what it hopes to gain through the use of group-based financial participation and extensive employee involvement programmes. While these programmes were clearly *associated* with better performance at the case study firm this notion is more rigorously tested in Chapters 5 and 6. Chapter 5 provides clear empirical evidence that in settings where work areas are 'interdependent' on one another, group-based incentives are more efficient than individual-level incentives. In Chapter 6, we see additional clear empirical evidence that it is the *combination*

of employee involvement and group incentives which promotes optimal performance outcomes.

Overall, this thesis provides strong evidence that it is efficient to involve employees in decisions. It further concludes that in settings where the tasks performed are interdependent, group-based incentives are the most effective. Furthermore, in these same settings, the *most* efficient way of designing the employment relationship is to both involve employees and reward them on the basis of group output. This combination may be efficient in both the manufacturing and service sector, and for both high-skill level and low skill-level employees who may have potentially profitability-enhancing information.

Chapter 8.0

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