

CHAPTER 4

Profit-sharing in OECD countries

A. INTRODUCTION AND MAIN FINDINGS'

This chapter discusses the incidence of profit-sharing in OECD countries – the proportion of firms that practice it and the numbers of employees affected – and reviews its effects on productivity and employment at the firm level. Profit-sharing may be favoured by governments and by firms for a wide variety of reasons [Le Grand and Estrin (1989)]. Here, the primary focus is on profit-sharing as a method of payment which provides employees with incentives for improved performance.

As increased competition in product markets has led to a search for better company performance, attention has been given to ways of rewarding workers for their output, rather than for their time. Such systems include individual incentive schemes; group incentive schemes; and company-wide schemes. Profit-sharing can be regarded as an important class of company-wide schemes. Its distinguishing characteristics are: as part of their remuneration, a proportion of profits is shared out among the bulk of workers in the company; and both the proportion of profits and the rules for its allocation between workers are determined in advance (see the Box).

There are a number of reasons for examining profit-sharing. It has grown rapidly in some countries in recent years and there has been considerable discussion of its potential effects on employment patterns – stemming, *inter alia*, from the propositions of Weitzman (1984, 1985) concerning the benefits of a “Share Economy”. Partly in consequence, the empirical literature on profit-sharing is now quite extensive, at least at the level of the firm.

Following a review of the main findings, the chapter begins by clarifying the concept of profit-sharing. It then presents information on the incidence of the different types of profit-sharing arrangements in OECD countries. Succeeding sections review evidence about the characteristics of firms with profit-sharing, and about its impact on firm-level productivity, employment stability, and employment levels. No analysis of the macroeconomic effects of profit-sharing is undertaken, because the empirical evidence is considered to be lacking.

Main findings

i) *Incidence of profit-sharing in OECD countries*

Profit-sharing as defined in this chapter, covers 5 per cent or more of employees in Canada, France, Germany, Italy, Japan, Mexico, the Netherlands, the United Kingdom and the United States. With the exception of Italy, these are countries where profit-sharing has been encouraged, directly or indirectly by legislation and/or tax concessions. However, the examples of Italy, and of cash-based plans in Canada, show that profit-sharing can grow without specific legislation to encourage it. The form of profit-sharing varies considerably, in ways which are closely linked with national traditions and legislation. In North America, it has traditionally been used to allow employees to build up retirement funds. Profit-sharing bonuses typically represent roughly 3 to 5 per cent of total remuneration, though they are higher in some cases. Recently, profit-sharing has grown rapidly in a number of countries, including Canada, Finland, France and the United Kingdom.

ii) *Characteristics of firms implementing profit-sharing schemes and its effects*

A complete explanation of the reasons firms adopt profit-sharing seems impossible on the basis of current evidence. However, it is found more often in larger, more profitable firms, multinationals, financial sector enterprises and firms with higher than average skill levels. A considerable body of evidence suggests that the introduction of profit-sharing is associated with a rise in the level of productivity in the firm. The estimated size of the gain varies considerably from case to case, but is often substantial. For the United States, there is some evidence, though very mixed, that profit-sharing firms display lower employment variability over the cycle. However, for Europe no conclusion seems possible. The evidence for the proposition that the introduction of profit-sharing produces stronger employment performance at the firm level is likewise inconclusive.

Compensation systems, incentives and employee performance*

With the growth of international competition and rapid technological change, there is an increasing need for efficient allocation of workers to sectors where their potential productivity is highest, and for eliciting high levels of performance from workers within organisations. As the market price of labour, compensation provides a key signal in the process of guiding labour resources to their most productive employment. Compensation systems vary in their potential for attracting high-performance employees. Some may also be designed to economise firms' screening costs by inducing self-selection by workers according to the performance characteristics desired by the firm.

As well as allocating workers between jobs, there is growing interest in the potential of compensation systems for improving the operation of "internal" labour markets within companies. Compensation systems vary in the extent to which they induce a higher work effort by employees, and in their potential for encouraging skill development and reducing labour turnover.

The broadest distinction between different types of compensation systems is whether remuneration is based on measures related to the input or the output of employees. Systems based on the input of the employee provide compensation according to some measure of the time spent at work. As workers cannot immediately increase earnings by working harder, performance incentives over the short-term may be weak, and close supervision may be needed to monitor individual output levels in order to minimize shirking. However, over the longer-run incentives may be strengthened by systems of periodic reviews, linked to retention, increases in pay, and promotion into higher paying jobs. In addition, in the context of jobs offering a career, a time-based compensation system may provide incentives for skill development. Workers will have an incentive to make training investments if post-training wages increase rapidly enough to yield an attractive return on their investment.

Systems related to the output of employees may provide incentives based on the output of individuals, of groups of workers, or of companies as a whole. Individual incentive payments may be tied to physical output (e.g. piece rates or payment-by-results) or a measure of value (e.g. sales commissions). As they offer a more variable income stream, which depends on the energy and efforts of employees, they should attract workers who are relatively productive and tolerant of risk. In the United States, piece-rate workers earn about 10 to 20 per cent more than equivalent time workers. No doubt this is partly due to the selection of relatively productive workers. However, another factor is likely to be the higher effort induced by an individual incentive system. When the effect of individual incentive systems is merely to attract more able workers to firms that operate them, away from firms that do not, the gains in the first set of firms will be offset by losses in the second. However, net gains should occur when the individual incentives induce greater effort.

Individual incentive schemes are most suited for simple repetitive tasks in stable work settings in which individual contributions to output are easy to measure, the quality of output is easy to monitor, and there is less need for skill development and co-operation between workers. When contributions to output are more difficult to measure, problems are likely to occur when output norms are set, as workers will have an incentive to try and establish low norms, and may resist the introduction of working methods and technologies thought likely to raise them. When individual incentive schemes reward workers only for responding to a single measure, other dimensions of the job may be neglected. For example, if pay is based only on quantity of output, quality may suffer. Such schemes may also be incompatible with skill development, since time dedicated to training reduces output and income, unless ways are incorporated for rewarding workers for their knowledge, or the number of different tasks that they are able to perform.

Where effort and performance are difficult to measure, group incentive schemes may be used to attempt to align employee interests more closely with those of the organisation. They consist of bonuses, additional to the base-wage, that depend on some measure of the performance of some segment of the work force (such as a team working on the development or production of a particular product line) or the organisation as a whole. The bonuses may be either in the form of cash or shares, depending on the nature of the plan.

A wide variety of group incentive plans have evolved in OECD countries. Gain-sharing plans link the pay of a group of employees to improvements in some relevant measure (or measures) of internal productivity. Employee stock ownership plans (ESOPs) provide company stock accounts to certain groups of employees. They may apply to the whole company, or to selected groups, such as senior executives. Employees generally receive dividends and share price increases on the stock in their ESOP account, thus linking their wealth to the well-being of the firm. Finally, profit-sharing plans, the subject of this chapter, supply a part of total remuneration in the form of a share of the profits that have accrued over the pay period. As explained in more detail in the text, they generally include

* This is based on a review of incentive pay systems prepared for the OECD by Professor Robert Flanagan.

(Continued)

both a rule determining the pool of profits available for distribution to employees and a formula for distributing the pool of profits between individual workers. They may provide for current or deferred distribution and the bonus may be paid either in the form of cash or shares.

While each of these group and company-wide incentive plans links remuneration to the performance of the organisation, they will not guarantee an increase in productivity simply on this account. One reason is that, under group incentives, the benefits of one individual's additional effort is spread over all employees in the firm or production unit. If there are n employees in the group, each individual receives only $1/n$ of the benefits of his or her extra effort. At the same time, those who do not raise their performance level nonetheless benefit from the efforts of those who do. In addition, variations in company performance may occur for a wide range of reasons that have nothing to do with worker efforts, and this may tend to dilute individual incentives even further. One key question is, thus, how to make incentive schemes effective by creating a work environment that encourages a high-performance norm rather than a low-performance norm. Profit-sharing and other financial participation schemes may also play a role in achieving this.

B. WHAT IS PROFIT-SHARING?

The idea that workers might be paid in part out of profit is not new. Theoretical arguments were developed by the German economist, J.H. von Thunen, as early as 1848, the first U.S. profit-sharing plan was introduced in 1794 [Coates (1991)], and a number of British utilities operated schemes before the turn of the twentieth century [Hatton (1988)]. The standard definition of profit-sharing, used in this chapter, was adopted at an international Congress on Profit Sharing held in Paris in 1889 [Cynog-Jones (1956)]. To quote:

“Profit-sharing refers to definite arrangements under which workers regularly receive, in addition to their wages and salaries, a share on some pre-determined basis, in the profits of the undertaking, the sum allocated to workers varying with the level of profits.”

In current usage, the share of profits may be paid in cash or in shares, and may be deferred for a number of years. It may be allocated between eligible employees equally, or according to any number of factors, such as length of service. The payments may be conditional on profits being superior to some pre-determined level. While, theoretically, employees could receive negative payments when the firm makes a loss – resulting in net remuneration lower than the basic wage – in practice this is never the case.

The features distinguishing profit-sharing from other financial participation schemes, and from other types of bonus and incentive systems mentioned in the box, are:

a) the profit-sharing bonus is paid to all or most employees in a firm or establishment. Executive bonus schemes are excluded. However, the coverage of the scheme may be subject to restrictions,

for example a specified length of job tenure at the firm;

- b) the level of the bonus is determined by reference to company performance. Although normally assessed in terms of profits, the field of interest extends to schemes which are based on a combination of measures, including productivity, provided they are regarded as measures of company performance. Incentive schemes based on individual and group performance are excluded from the definition, as are bonuses paid independently of company performance;
- c) the rules determining the level of the profit-sharing bonus and the arrangements for its distribution between employees are both determined and made known in advance. Thus, discretionary bonuses are excluded; and
- d) employee shareholding schemes are included only if the share allocation can be regarded as a profit-sharing bonus. Regular distributions of share or stock options, made regardless of company performance, are excluded.

In practice, profit-sharing schemes are often complex, and many contain a number of different elements. The intention of the chapter is to include all major schemes with a significant profit-sharing component.

Sub-categories of profit-sharing

A number of different types of profit-sharing schemes were alluded to above. The following classification, which also appears in the PEPPER Report [Uvalic (1991)], is followed in Tables 4.1 and 4.2.

Cash-based schemes (CPS) involve immediate cash payment out of profits and, hence, offer the most tangible incentive to employees over the short-

Table 4.1. Profit-sharing in practice in selected OECD countries^a

	General stance of legislation	Proportion of all employees covered	Recent change in proportion	Proportion of firms with scheme	Recent change in proportion	Type of firms involved	Performance indicator	Eligibility/ Allocation indicator	Time bonus deferred	Proportion of earnings in firms
Australia										
Informal schemes ^b only	Permits.	Roughly 3%	n.a.	4% of private sector workplaces with 5 or more employees	n.a.	Comparatively common in financial sector, manufacturing	n.a.	n.a.	n.a.	n.a.
Belgium										
Various types of CPS and DPS, including "profit-sharing certificates" (PSC) ^c	Constrains/prohibits.	n.a.	n.a.	10% of large firms replying to survey (2/3 CPS, 1/3 PSC).	Growth occurred mainly during 1987-1990.	Mainly financial sector (especially for CPS), also large firms and multi-nationals	Wide variety, including profits and return on capital	Variety, including salary, rank and merit (last always used for PSC)	None (most cases), sometimes until end of job	Roughly 1.5-6%, usually at lower end of range
Canada										
Cash profit-sharing (informal schemes)	Permits.	Roughly 12% in early 1990s	Doubling over the 1980s.	15% of firms with > 20 employees in 1990.	Increase of at least a third over 1980s.	No special features.	Generally profits.	n.a.	-	n.a.
"Deferred Profit-Sharing Plans".		Under 8% in the early 1990s.	Decline over 1980s	4% of firms with > 20 employees in 1990.	Decline over 1980s.	Larger, older firms, even distribution by ind. sector and union status.	Profits.	Most often pay level, sometimes also seniority.	Generally until retirement.	2-4%
Finland										
"Personnel funds and profit bonus system" (DPS)	Permits/encourages.	Roughly 7% of employees in firms with >30 employees in 1994.	n.a.	Roughly 1% of firms with > 30 employees in 1994.	n.a.	Mainly large manufacturing export companies.	Linked to operating margins.	Usually hours of work, possibly wages.	n.a.	Roughly 5% of gross wages on average.
France										
<i>Intéressement des salariés</i> (CPS)	Encourages.	19% of all non-governmental employees in 1992.	See Chart 4.1	0.7% of all enterprises, 10% of those with > 50 employees in 1992.	See Chart 4.1	Progressively more common in larger firms.	Profits alone in 80% of cases.	Usually wages, possibly adjusted by absences	-	2% on average of gross wages for firms running a scheme; 3% for those paying bonuses, in 1993.

Table 4.1. Profit-sharing in practice in selected OECD countries^a (Cont.)

	General stance of legislation	Proportion of all employees covered	Recent change in proportion	Proportion of firms with scheme	Recent change in proportion	Type of firms involved	Performance indicator	Eligibility/ Allocation indicator	Time bonus deferred	Proportion of earnings in firms
France (Cont.)										
Participation aux fruits de l'expansion (DPS)		Roughly a third of all non-governmental employees in 1993	See Chart 4.1	All firms with > 50 employees [not yet all in range 50-99 in 1994)	See Chart 4.1	All firms with > 50 employees, no distinction by industry	Specified in legislation	Normally in proportion to wages	3 years – 5 years for full tax concessions	4% on average of gross wages for firms paying bonuses, in 1993
Germany										
Cash-profit-sharing (informal schemes)	Permits	Roughly 6 %	n.a.	Roughly 1%.	n.a.	n.a.	Various, including sales, value added, pre-tax profits and others.	Various, including gross earnings, tenure, working hours, or equality.	–	5 to 10% of gross earnings.
Share- and capital-based profit-sharing		Roughly 4%	Some recent fall – perhaps 1/3 since 1983	Roughly 0.5%.	Some recent fall – perhaps one half since 1983.	Different types of schemes used by firms of different sizes.	Value added.	Tenure, per capita	n.a.	0.3 to 0.5% of net earnings.
Netherlands										
Informal schemes of various types [no information on Vermeend-Vreugdenhil law yet available)	Permits	Roughly 10 to 20% of business sector employees in early 1990s	n.a.	n.a.	n.a.	Relatively more common in large firms, and business services.	70% use accounting or fiscal profits.	Varying between firms.	n.a.	Median of 4% of total gross earnings in 1992, higher for managers.
United Kingdom										
Profit-Related Pay scheme (PRP) (CPS)	Encourages.	Just over 5% [at end 1993).	See Chart 4.2.	4 615 schemes at end 1993 (02% of all enterprises)	See Chart 4.2.	n.a.	Profit, or changes in profit since previous period.	Usually base salary, sometimes also seniority.	–	Average 2-5%.
Approved Profit-Sharing scheme (APS) (SPS)		Just over 3% (1992)	See Chart 4.2.	Total of 1 015 schemes approved since 1979	See Chart 4.2	Particularly large firms, and UK owned firms.	Mainly profits – but only 60% of schemes use pre-determined formula.	Base salary in 80% of cases.	n.a.	Average share appropriation of €450 in 1991/92.

Table 4.1. Profit-sharing in practice in selected OECD countries^a (Cont.)

	General stance of legislation	Proportion of all employees covered	Recent change in proportion	Proportion of firms with scheme	Recent change in proportion	Type of firms involved	Performance indicator	Eligibility/ Allocation indicator	Time bonus deferred	Proportion of earnings in firms
United States										
Cash-based profit sharing	Permits/ encourages.	n.a.	n.a.	3% of firms with > 100 employees have CPS (of which 2% have both CPS and DPS).	No marked change in firms with >100 employees over 1985-1989.	Relatively more common in smaller firms.	Pre-tax profits possibly excluding "unusual" items.	Sometimes restriction by tenure or to permanent full-time. Allocation by earnings, possibly also tenure and performance.	-	n.a.
Deferred profit sharing.		n.a.	n.a.	15% of firms with >100 employees have DPS (of which 2% have DPS and CPS).	Four-fold increase from 1969 to 1989, but rate slowed after 1985.	n.a.	As above	As above.	Normally until retirement	n.a.

- Not applicable

n.a Not available.

a) CPS = Cash-Based Profit-sharing scheme

DPS = Deferred Profit-sharing scheme

SPS = Share-Based Profit-sharing scheme

For definitions of these terms, see the text

b) "Informal schemes" are those not subject to specific legislation. Information on the specific schemes mentioned is to be found in Table 4.2.

c) "Profit-sharing certificates" refer to schemes under which employees receive a number of certificates giving them the right to share in the profits of the company but do not represent a share in the capital of the company.

Sources	Australia	Peetz and Oxley (1994) and other information supplied by the Australian Department of Industrial Relations.								
	Belgium:	Information provided by Professor F. Van Den Bulcke, OFP (Research Centre for Financial Participation, Catholic University of Brussels), and derived mainly from a survey of financial participation in 520 companies selected from the "Trends Top 5000 companies", of which 140 responded.								
	Canada	Long (1992), Hewitt Associates (1993) and other information supplied to the Secretariat by Professor Richard J. Long.								
	Finland	Information supplied by the Ministry of Labour								
	France	Information supplied by Mrs Virginie Pérotin, ILO.								
	Germany	Information supplied by Dr Vivian Carstensen of the Institut für Quantitative Wirtschaftsforschung, Universität, Hanover, taken partly from Bundesministerium für Arbeit und Sozialordnung (1994)								
	Netherlands	Information supplied by Professor M.J. Ellman of the University of Amsterdam.								
	United Kingdom	For PRP, UK Treasury (as quoted in EPW) for numbers of schemes and employees covered; for APS, UK Treasury [as quoted in Poole and Whitfield (1994)] for numbers of schemes, employees covered and average share appropriation. Other information from CBI/Wyatt (1994).								
	United States	Information derived from the US BLS 1989 Employee Benefits Survey, as reported in Coates (1991), supplemented by information supplied by the Profit Sharing Council of America, including the 1989 Survey of Compensation Trends and Practices of Hewitt Associates.								

Table 4.2. Main features of some specific legislation concerning profit-sharing^a

	modified					
					Employer	Employee
Canada "Deferred Profit-sharing Plans" (DPSPs – designed to serve as pension plans)	Introduced in 1968 Alternative pension plan arrangements introduced in 1983 greatly reduced effective tax advantages of DPSPs	From 1981, employees holding >10% of stock (and their relatives) no longer eligible	No restriction	No restriction	None	Tax deferred until payments received from fund.
Finland Personnel funds and profit-bonus system (DPS – payments deferred 10-20 years)	1 January 1990.	All employees must normally join, except fixed-term contract and management.	Substantially based on company profit.	Not specified.	Bonuses exempt from payroll taxes.	Tax deferred until payments received from fund.
France <i>Intéressement des salariés</i> (CPS)	Introduced in 1959, simplified in 1986 to increase attractiveness. In 1990 maximum bonus raised to 20% of gross wages.	Applies to all workers. No bonus need be paid if profits low.	Negotiated. May be combination of company performance indicators	Same rule applies to all employees.	Bonuses exempt from payroll taxes.	Bonus exempt from social security payments and, if put into company savings plan, from income tax.
<i>Participation aux fruits de l'expansion</i> (DPS)	Introduced in 1967. Last significantly modified in 1990 (extension from all firms with > 100 employees to all with > 50 employees).	Detailed conditions laid down – see notes.	Profits.	Same rule applies to all employees.	Bonuses exempt from company taxes and payroll taxes.	Bonus exempt from social security payments and, if frozen for 5 years, from income tax (taxed at 50% if frozen for 3 years).
Germany Various schemes to encourage employee stock ownership, which also apply if this is done on a profit-sharing basis	SPS type schemes promoted from 1984 onwards. Latest changes have reduced the modest fiscal advantages offered.	Eligibility for subsidy restricted to low earners, (single people < 27 000 DM, married < 54 000 DM).	Not specified in legislation.	Not specified in legislation.	None.	Subsidy of 10% of value of bonus (up to a total of 936 DM p.a.) for low earners. First 300 DM of additional bonus is also exempt. However, in both cases, funds must be frozen for six years.
Mexico Workers Shares in Enterprise Profits (CPS deferred sixty days)	February 1985	Obligatory. Workers (excluding directors, management and domestic employees) share 10% of profits in all enterprises, with some exclusions, such as new enterprises and those with low capital assets.	n.a.	Number of days worked, and annual salary	None	None

Table 4.2. Main features of some specific legislation concerning profit-sharing^a (Cont.)

	modified				Employer	Employee
Netherlands						
Vermeend-Vreugdenhil law (Mixed – allows for immediate cash payments, issues of shares and other securities, share options, and savings account deposits)	1994. Relevant tax percentages modified in 1995.	At least ¼ of employees must benefit.	Must be related to and fluctuate with profits.	n.a	Payroll taxes reduced to 20% on cash payments and to 10% (1995 figure) when bonus frozen in savings account for 4 years.	Profit-sharing bonus of up to DFL 1 580 (1995), roughly 3% of average full-time adult gross earnings, is tax free, as is interest on savings accounts.
United Kingdom						
Profit-Related Pay (CPS)	Introduced in 1987, simplified in 1991.	At least 80% of employees with three years service must be covered.	Company profits.	Similar rule for all employees	None.	Tax relief applies to PRP payment, up to 20% of total pay, or €4,000 (whichever is lower).
Approved Profit-sharing Share schemes (SPS)	Introduced by 1978 Finance Act.	Open to all employees with 5 years service.	Not stipulated	Similar rule for all employees.	Value of shares deductible from corporation tax.	Income tax exemption if shares held 5 years.
United States						
Deferred Profit-sharing	Current legislation dates from Internal Revenue Code of 1954. To qualify for tax concessions, plans must comply with the Employee Retirement Income Security Act of 1974.	Special vesting conditions; plan participation must be spread broadly throughout firm.	Pre-tax profits, possibly with exclusion of “unusual” items.	Earnings, possibly weighted by tenure and/or performance	None	Plan earnings accumulate on a tax-deferred basis, and distribution is tax-free on retirement after age of 59½.

a) CPS = Cash-Based Profit-sharing scheme
DPS = Deferred Profit-sharing scheme
SPS = Share-Based Profit-sharing scheme
For definitions of these terms, see the text.

Sources: Canada: Information taken from Long (1992), Revenue Canada (1993) and other information provided to the Secretariat by Professor Richard J. Long.
Finland: Information supplied by the Ministry of Labour
Germany: Information supplied by Dr Vivian Carstensen of the Institut für Quantitative Wirtschaftsforschung, Universität, Hanover.
France: The standard formula applied for calculating the amount of money to be put into the Special Participation Reserve (Reserve Spéciale de Participation) is one half of taxable profits, after deducting an allowance of 5% for remuneration on capital employed, multiplied by the ratio of total wages to value-added (the last is intended to reflect the proportionate contribution made to profits by labour). However, variations are allowed, provided the benefits to employees are not reduced and the Reserve does not exceed certain levels Uvalic (1991); Premières Informations, No. 445, 27 January 1995, DARES, Ministère du Travail, additional information from Mrs Virginie Pérotin.
Mexico: Information supplied by the Secretaria del Trabajo y Previsión Social.
Netherlands: Information supplied by Professor Michael Ellman of the University of Amsterdam.
United Kingdom: Uvalic (1991); CBI/Wyatt (1994).
United States: See sources to Table 4.1

term. *Share-based schemes* (SPS) involve the possibility of employees acquiring shares in the company free or on preferential terms. Profit-sharing involving employee share ownership should provide a more forward-looking and longer-term incentive than cash-based schemes as, provided the shares can be sold, the employees' return from improved company performance can take the form of capital appreciation as well as income. Schemes of this kind are normally more attractive when shares are quoted on the stock market, because this provides them with a price and facilitates liquidity. Of course, share-based schemes also involve employees in the possibility of the loss of capital, as well as lower income, if the shares do badly. With SPS, the shares often carry no voting rights. In *deferred profit-sharing* (DPS), the bonus, whether in cash or in shares, cannot be realised before a pre-determined period of time has elapsed. From the firm's point of view, this avoids unexpected burdens on cash flow, and may also serve to strengthen the longer-term attachment of employees to the company.

C. INCIDENCE OF PROFIT-SHARING IN THE OECD AREA²

Profit-sharing is considerably more prevalent in some countries than in others, as indicated in Tables 4.1 and 4.2. Table 4.1 presents information about the incidence of profit-sharing for those countries where it is significant and where detailed information is available. Table 4.2 covers legislation specifically designed to encourage profit-sharing, indicating where profit-sharing bonuses are granted more favourable treatment than wage payments. Statistical information about profit-sharing has to be interpreted with caution. Data from government sources generally cover only those schemes that qualify for tax concessions; information from enterprise surveys suffers from problems of non-response and may not distinguish between profit-sharing and other types of financial participation schemes. However, despite these *caveats*, it is possible to divide the countries into a number of broad groups.

1. Countries where 5 per cent or more of all employees are covered

This first group of countries comprises Mexico, France, the United Kingdom, Japan, Canada, the United States, Germany, the Netherlands and Italy.

In 1985, *Mexico* made cash-based profit-sharing obligatory for all enterprises, excluding new enterprises (those with under one year of operation, or two years if producing new products), the mining industry, private assistance institutions, public social assistance institutions and enterprises with less than a certain amount of capital. All of their workers, includ-

ing directors, management and domestic employees, are covered. The profit share is fixed at 10 per cent and is allocated between eligible employees in two parts: the first being proportional to the number of days worked during the year and the second to the annual salary. Profit-sharing clearly covers a substantial portion of the Mexican workforce, although precise estimates and detailed information are not available.

France is the only other OECD country to have regulations obliging firms to share profits, by means of *participation*, a deferred profit-sharing plan. Its full title, "(employee) participation in the benefits of growth" reveals the aim of the scheme when it was introduced in 1967. It has always been obligatory for firms with 100 or more employees; changes in 1990 lowered the threshold to 50 employees. Smaller firms may run such a scheme on a voluntary basis. The details of the scheme – the proportion of profits to be shared out, the length of time payments are to be deferred and the method of allocation – are laid down in the legislation. Employers' contributions are exempt from both corporation and payroll taxes. After 5 years, employees can withdraw income free from income tax and social security contributions (with the exception of the *contribution sociale généralisée*).

The second French scheme, *inte'ressement*, is a voluntary, cash-based profit-sharing scheme, intended to provide a supplement to basic wages. The company performance indicator may have a number of elements and, especially in larger firms, may be designed to reduce the variation in profit from year to year. For employers, the tax concessions are similar to those for *participation*. Employees are granted relief from social security contributions and, if the bonuses are placed in an approved company savings scheme, from income tax.

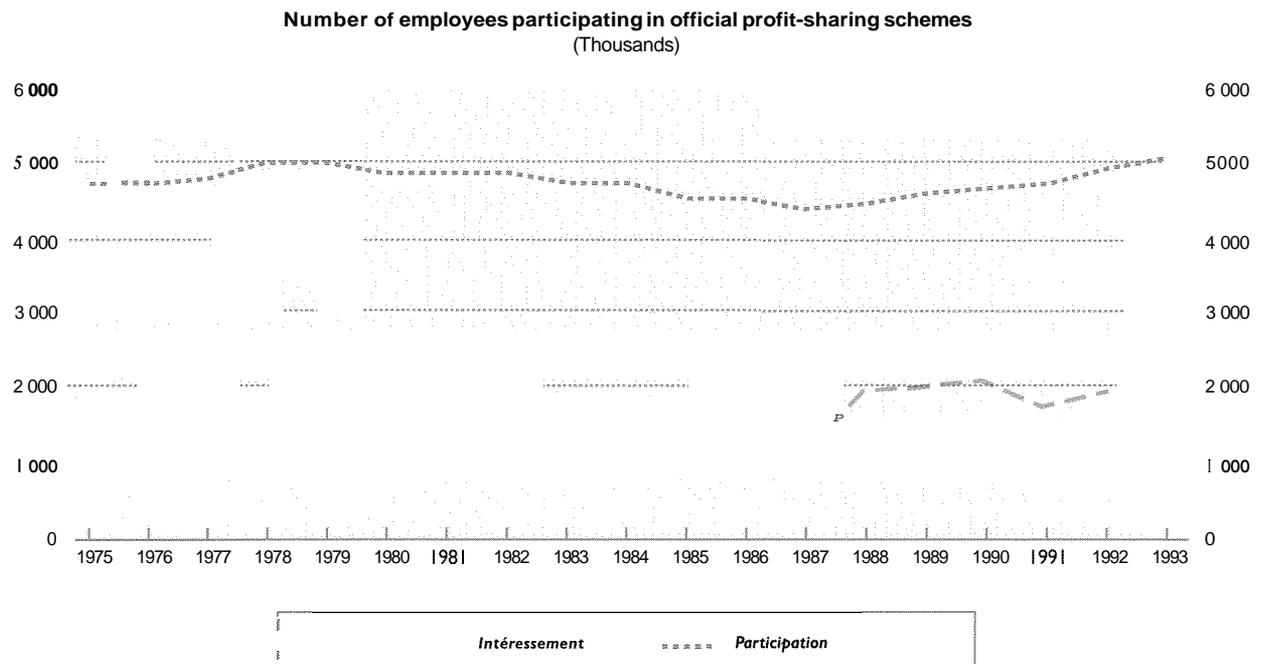
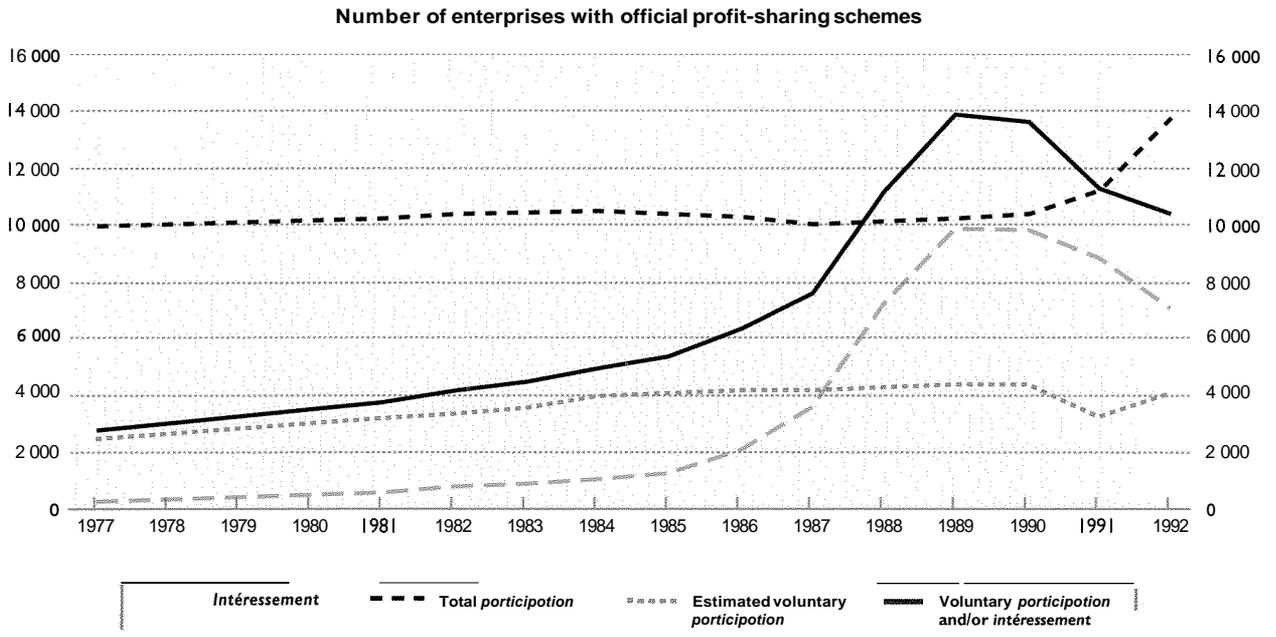
Chart 4.1 includes estimates of the number of French firms with voluntary profit-sharing, defined as the sum (excluding double-counting) of those with *inte'ressement* and those with voluntary *participation*. In the earlier part of the period, the growth in voluntary profit-sharing was due to the voluntary component of *participation*. Later, and especially after 1986, *inte'ressement* spread much faster, especially after the administrative procedures were simplified. Some of the decrease in voluntary profit-sharing observed after 1990 is no doubt due to the extension of the obligation to have a *participation* scheme.

The *United Kingdom* legislation also strongly encourages profit-sharing, but solely by means of tax concessions, granted to Approved Profit-sharing Share (APS) schemes and to Profit Related Pay (PRP) schemes.

The APS legislation is designed to encourage employee share holdings. Despite the name, there is no strict link to company performance. Nevertheless,

Chart 4.1

Official profit-sharing schemes (*intéressement* and *participation*) in France^a



a) For information about the schemes, see Table 4.2.
 Source: Data on intéressement and participation were provided by the Direction des Relations du Travail, du Ministère du Travail, de l'Emploi et de la Formation professionnelle; the overall number of firms with voluntary plans was estimated by Saul Estrin and Virginie Perotin.

about 60 per cent of these schemes do use a pre-determined formula based on performance, the remainder falling outside the standard definition [CBI/Wyatt (1994)]. Ordinary shares of the company are bought by a trust funded by the company and distributed to employees. There is a minimum retention period of two years; five to qualify for income tax relief. All employees with at least five years service are eligible to participate and the allocation between them must be based on a uniform procedure. Since 1978, when the scheme was introduced, the minimum retention periods have been shortened and the maximum share allocation per person increased.

PRP schemes, introduced in 1987, are cash-based profit-sharing schemes providing tax concessions to employees. Their introduction is conditional on the approval of the workforce. At least 80 per cent of all employees with at least three years of service must participate and the allocation between them must be made according to a uniform procedure. Bonus payments are exempt from income tax, up to the limit of 20 per cent of gross wages, or €4 000, whichever is lower. PRP is very similar to *intéressement*, although, unlike the French scheme, it must be based solely on profits and income tax relief is more readily available. The official Green Paper that preceded the introduction of PRP explained that one of its aims would be to achieve greater employment stability over the cycle, through increasing wage flexibility.

The initial growth in the number of PRP schemes was slow. However, it picked up rapidly when the rules were simplified and clarified in 1991. While it seems likely that some of the early schemes represented conversions of already existing plans that had not been eligible for tax benefit, the continued growth suggests that new schemes were being introduced (Chart 4.2). However, it is also possible that some of them were “cosmetic”, owing more to changes in accounting practices than real behaviour. Unlike APS, the measured growth in PRP schemes continued through the recession.

The proportions of all employees currently covered by these schemes are around 3 per cent for APS and 5 per cent for PRP. As they are found disproportionately in large firms, the proportion of firms with such schemes is much lower. However, these figures cover only those schemes that attract tax concessions. The 1990 U.K. Workplace Industrial Relations Survey (WIRS) found indications of some form of profit-sharing in over 40 per cent of private-sector establishments [Millward (1994)].

Japan has sometimes been cited as an example of a “Share Economy”, in the sense that a substantial part of remuneration in large firms has been assumed to be based on profit-sharing [see, for example, Weitzman (1984)]. However, more detailed examination shows that, while profit-sharing is, indeed, wide-

spread in *Japan*, it is employed by only a proportion of large firms. In addition, although a substantial proportion of remuneration is in the form of bonuses, only a part of these bonuses falls under the definition of profit-sharing, and the sensitivity of bonuses to current profit levels appears to be quite low.³

Japanese tax and social security arrangements strongly encourage the use of bonuses, which are defined simply as lump-sum payments with an interval of at least three months between them. In 1986, manufacturing firms with more than 500 employees paid 30 per cent of total remuneration in the form of bonuses, and the corresponding figure for firms with 30 to 99 employees was 18 per cent. Bonuses attract lower social security payments than wages and also offer firms some extra reduction in corporation taxes. Profit-sharing bonuses are treated exactly like other bonuses.⁴

While bonuses are very widespread, profit-sharing ones are less so. The 1983 General Survey on Wage and Working Hours System indicates that 15 per cent of firms with 30 or more employees paid profit-sharing bonuses calculated by means of an explicit formula based on company performance – an essential part of the definition used in this chapter. For the largest firms, with over 1 000 employees, the figure was 8.3 per cent. (It was 19.9 per cent for firms with 100 to 999 employees and 12.9 per cent for firms with 30 to 99 employees.) The bonuses were linked to a variety of variables, including profits, sales and value added.⁵

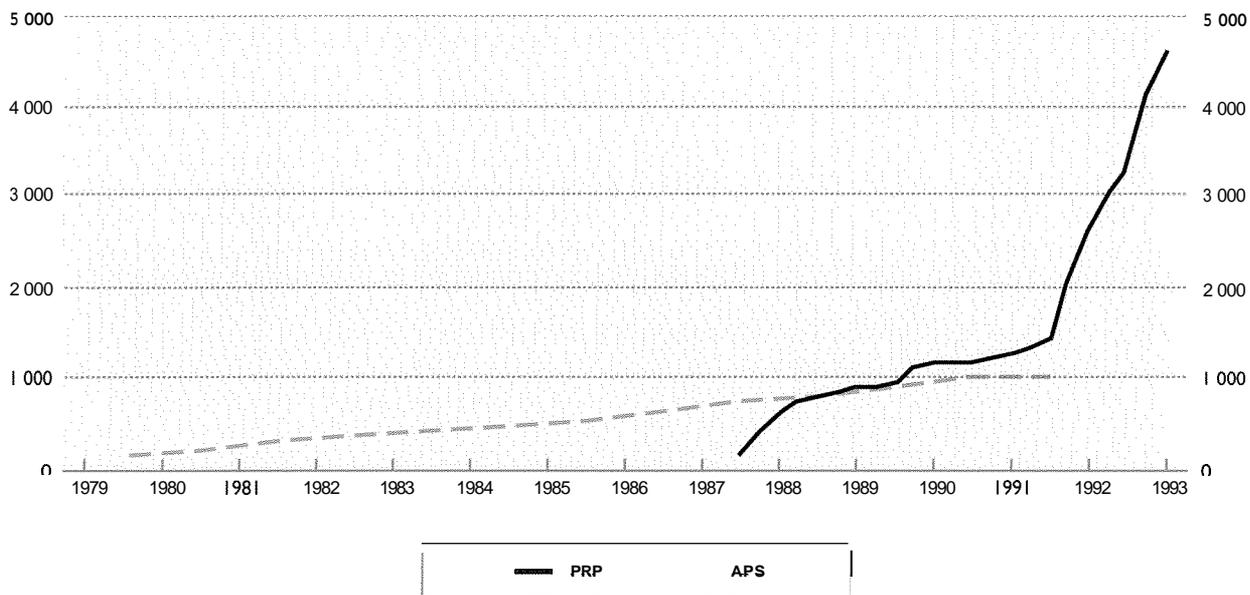
Even when firms pay profit-sharing bonuses, the total bonus usually involves a discretionary bonus in addition.⁶ The sensitivity of the total bonus to current profits may thus be small, because the firm is at liberty to adjust the discretionary element of the bonus, both to keep the total remuneration in line with market levels and to ensure that the year-on-year variation is small. Hashimoto (1990) points out that firms are generally free to do this because “conditions for receiving bonuses are rarely stated in employment contracts”. Dore *et al.* (1989) note that job advertisements in the mid-career market frequently give an indication of the normal bonus level in terms of a multiple of the monthly wage and take this as an indication that the overall level of bonus is not expected to vary greatly with profits.

Several econometric studies have tested the *ex post* relationship between Japanese bonuses and profits. Freeman and Weitzman (1986) conclude that bonuses do generally behave in a way consistent with the presence of a quantitatively significant profit-sharing component. However, after reviewing a number of studies, Dore *et al.* (1989) consider that “the most comprehensive work ... is that of Koshiro (1986), who finds that for major firms the elasticity of bonus payment with respect to profit levels, calculated on the period 1973-1984, was 0.05”, and also note that

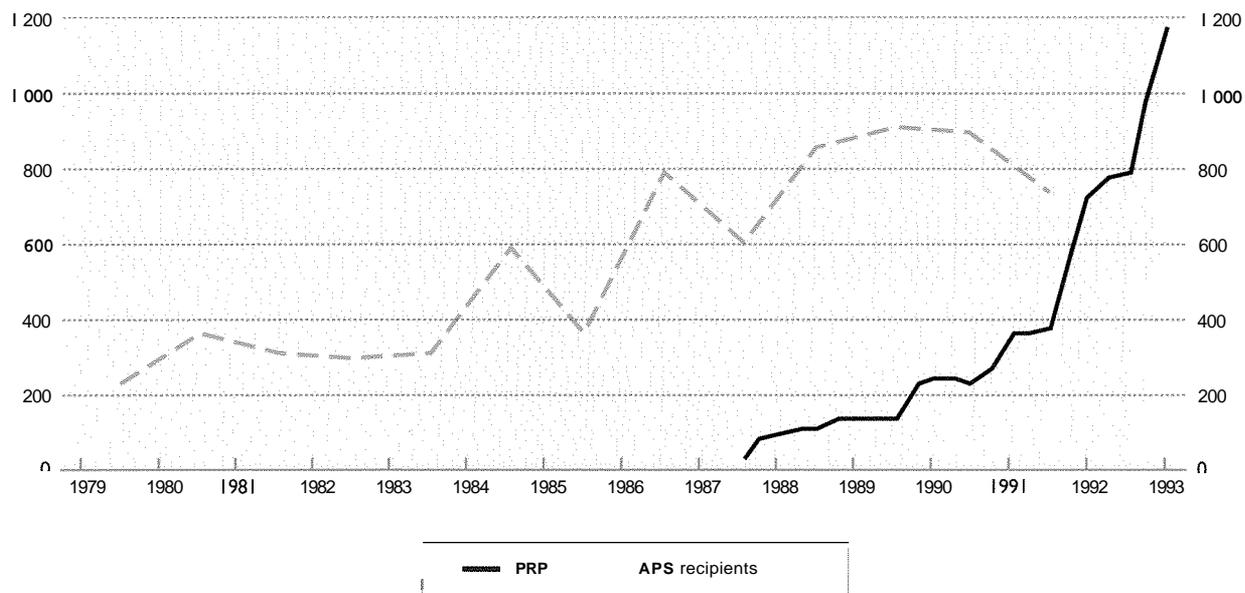
Chart 4.2

Official profit-sharing schemes in the United Kingdom^a

Numbers of Profit Related Pay (PRP) and Approved Profit Sharing Share (APS) schemes^b



Numbers of employees participating in PRP schemes and receiving APS share allocations (Thousands)



a) For information about the schemes, see Table 4.2.

b) The number of APS schemes shown relates to the total number of new schemes approved since 1978, ignoring the effects of attrition.

Source: United Kingdom Treasury data; PRP as in EPW, APS as quoted in Poole and Whitfield (1994).

Koshiro (1986) estimates that the elasticity of the bonus in one period with respect to that in the previous period (the "stickiness factor") was 0.73. This would imply that bonuses in Japan are not particularly sensitive to current profit levels.⁷

Canada and the United States also provide tax concessions for certain types of profit-sharing. Both countries have traditionally encouraged the use of deferred profit sharing as a means of building up employee funds for retirement, while providing no tax concessions for cash-based plans.

The Canadian "Deferred Profit Sharing Plans" (DPSPs) were introduced in 1968. Employers may make profit-sharing payments to an employee trust, within specified limits, and the resulting employee income is tax deferred. In 1981, legislation prevented DPSP being used as a tax deferral mechanism by major shareholders of small and medium-sized companies. In 1983, the income tax legislation was modified to provide all employees with an alternative and more attractive means of sheltering a portion of their income for pension purposes (the employer-sponsored registered retirement savings plans, or RRSPs). As every dollar paid into a DPSP reduces the permissible amount payable into RRSP, the tax advantages of DPSPs have effectively been eliminated. As a result, few new DPSPs have been introduced since 1983, and the total has most likely fallen due to attrition.

Cash-based profit-sharing plans, on the other hand, have grown rapidly in Canada, despite the absence of legislation to encourage them. While the available estimates do not concur precisely, as of 1990, about 15 per cent of firms with 20 or more employees were likely to have had a cash-based profit-sharing plan, representing a huge increase over the 1980s. Long (1992) evaluates growth between 1986 and 1990 at around 50 per cent, while McMullen, Leckie and Caron (1993) calculate a rise of just under 30 per cent over 1985-91. Hewitt Associates (1991) find that two-thirds of the plans existing in 1990 had been implemented since 1980. The proportion of private sector employees covered by cash-based profit-sharing may have roughly doubled over the 1980s.

In the United States, deferred profit-sharing plans, designed to allow employees to accumulate retirement funds, represent the vast bulk of schemes. The tax conditions are similar to those applying to Canadian DPSPs. Under current legislation, employers' contributions to deferred U.S. profit-sharing plans may be completely discretionary, and such plans would fall outside the standard definition [Blasi (1990)]. However, information gathered by the Hewitt Associates 1989 Survey of Compensation Trends and Practices suggests that company contributions were determined by specific profit-related formulae in around two-thirds of the plans. Chelius

and Smith (1990) conclude that the results of a 1987 survey "convey the strong general impression that profit-sharing, although mostly discretionary, is conducted in such a way that per-employee distributions do fluctuate with profit levels". According to the Profit Sharing Council of America, nearly all large companies have now established deferred plans. Results from the U.S. Bureau of Labor Statistics 1989 Employee Benefits Survey, covering firms with 100 or more employees, indicate that 16 per cent of employees in such firms were covered by profit-sharing plans [Coates (1991)].

Following a strong increase in the recession of the early 1980s, which Bell and Neumark (1993) attribute partly to their use in concession bargaining, the growth in U.S. deferred profit-sharing plans has recently slowed. This may be because nearly all large companies have now adopted them. Another reason may be the popularity of Employee Stock Ownership Plans (ESOPs), which have similarities to deferred profit-sharing plans and also attract tax concessions.

German legislation provides no incentives for profit-sharing *per se*. However, there is a considerable body of regulations designed to encourage employee share-holding and capital accumulation. Part of this acts to encourage profit-sharing, albeit not very strongly. Two main types of tax concessions are granted to employees but neither involves substantial payments, and fiscal advantages are available only if the money is not withdrawn for six years. Overall, the proportion of employees covered by these types of schemes seems to have fallen somewhat in recent years. While Germany grants no concessions to cash-based profit-sharing schemes, they are relatively common in firms which also have deferred or share-based schemes, and the proportions of employees covered by the two broad types of scheme are roughly comparable.

In the Netherlands, the legislation also provides weak incentives for profit-sharing, and that only by means of the Vermeend-Vreugdenhil (V-V) law introduced in 1994. The stated intentions of the law were to contribute to wage growth moderation (by offering employees a way of increasing their incomes other than by rises in base wages), to stimulate employee capital accumulation and to improve labour market flexibility. Profit-sharing bonuses may be paid in a variety of ways, and are tax-free to the employee up to a ceiling of 3 per cent of gross wages. Tax concessions are also available for employers, and are increased if the funds are blocked for 4 years. Even before the V-V law was introduced, around 10 to 20 per cent of employees in the business sector were estimated to have received profit-sharing bonuses from various types of schemes.

Italy has no legislation designed to encourage profit-sharing. Prior to the mid-1980s, there were few examples of financial participation of employees in

their affairs of their companies (excluding the case of co-operatives). However, towards the end of the decade, a considerable number of schemes developed, including both gain-sharing and profit-sharing.⁸

There are, as yet, no official estimates of the incidence of financial participation schemes in Italy and detailed information is not available. However, Biagioli, Broglia and Cardinaleschi (1992) estimate that, in 1991, around 900 000 workers were involved in 300 schemes providing for at least some element of profit-sharing. These figures represent just under 6 per cent of the total number of employees in Italy. They are considered by the authors to be an underestimate, as not all profit-sharing firms were covered. The recession and the beginning of the trilateral discussions between trade unions, employers confederations and government, resulted in few new financial participation schemes in the early 1990s.

2. Other countries

While Australia and New Zealand have no specific policy measures to encourage profit-sharing, there is evidence of profit-sharing in both countries, albeit at low levels, and New Zealand has seen some increase over recent years.

Taken as a group, with the exception of Finland, the Scandinavian countries have shown little policy interest in profit-sharing. Rather, there has been a prolonged debate about national wage-earner funds, financed as a percentage of profits for the benefit of all wage earners. Such funds were introduced in Sweden in 1984 but eliminated by the beginning of 1992. Denmark, Iceland, Norway and Sweden have no current legislation designed to encourage profit-sharing and its incidence is thought to be low.⁹

In 1990, Finland introduced a deferred profit-sharing scheme, the "Personnel funds and profit bonus system", which provides tax incentives to employers and is designed to facilitate the accumulation of capital by employees over the longer-term. Payments made by employers into individual employee accounts are deductible from payroll taxes and employer social security contributions. After 10 years, the employee is allowed to withdraw one-tenth of the money in the fund, though the whole may be withdrawn on leaving the company. Income tax is payable only on withdrawals. Take-up has been rapid, especially in large, manufacturing export companies.

In Belgium, profit-sharing has generally been permitted, but not encouraged, although the Royal Decree of 24 December 1993, designed to safeguard national competitiveness by allowing the government to impose a general pay freeze, also prohibited the establishment of new schemes. Various types of profit-sharing are fairly common in large companies, especially in the financial sector and in multinational

companies. As in Japan, the Belgian "profit-sharing certificates" allocate bonuses partly as a function of individual worker performance.

For Greece, Ireland, Luxembourg, Portugal and Spain, Uvalic (1991) reports that, while little empirical information is available, the incidence of profit-sharing is generally likely to be low. However, there are indications that political support for profit-sharing is growing in Greece, where tax incentives for both employers and employees were introduced in 1987, and the take-up of the cash profit-sharing scheme, in particular, may have been quite rapid. Ireland, too, has fairly extensive schemes to encourage profit-sharing.

In the remaining OECD countries, Austria, Switzerland and Turkey, the incidence of profit-sharing also seems to be low. In Switzerland, where profit-sharing must be agreed between the social partners, it is likely to concern well under 1 per cent of firms. Finally, in Turkey, where there is no legislation and no source of statistics, profit-sharing is thought to be spreading in large companies, especially financial sector companies and multinationals.

3. The impact of legislation

The pattern of incidence and growth of profit-sharing is clearly closely linked to national legislation. With the exception of Italy, all the other eight countries where profit-sharing is thought to cover at least 5 per cent of employees: Canada, France, Germany, Japan, Mexico, the Netherlands, the United Kingdom and the United States, have legislation which encourages it, either directly or indirectly. The recent growth in profit-sharing, observed in a number of countries, is often associated with changes in legislation. This includes the extension of the obligation for participation in France; the introduction of new schemes to encourage various types of profit sharing in Finland and the Netherlands; and changes in schemes to make them more attractive, whether by increasing available tax concessions or reducing administrative costs, as in the case of the cash-based schemes of France and the United Kingdom. For the United Kingdom share-based APS scheme, Smith (1993) reports that the majority of firms replying to a survey of the reasons for introducing APS reported that share-based schemes would not have been adopted in the absence of the tax concessions. On the other hand, Wadhvani (1987) and others have pointed out that the introduction of tax concessions can result in "cosmetic" changes to fixed bonus schemes to qualify them for tax concessions, without any real change in remuneration policy.

However, profit-sharing is not simply driven by legislation. The recent increases in cash-based profit-sharing in Italy and in Canada have occurred in the continuing absence of any supportive legislation.

Cash-based profit-sharing is also spreading in New Zealand and Turkey, again in the absence of legislative support, mainly through its introduction by larger companies and multinationals.

The predominant types of profit-sharing vary considerably from country to country in ways that are again linked to the prevailing legislation. In several countries, profit-sharing is an optional part of mechanisms designed to allow employees to accumulate capital over the longer-term. Some countries have widespread cash-based profit-sharing, others do not. These differences appear to stem from national traditions, rather than any particular economic or structural characteristics of the countries concerned.¹⁰

D. WHAT TYPES OF FIRMS HAVE PROFIT-SHARING?

This section reviews empirical evidence about the type of firms with profit-sharing, to provide a background for later analyses of its effects. In this area, little economic theory is available to guide analysts. Each of the following list of considerations has appeared in one or more studies.

1. Firm characteristics relevant to the choice of profit-sharing

i) *Size and structure of the firm*

It is not clear whether larger firms should be expected to be more likely to introduce profit-sharing than smaller ones. If profit-sharing is regarded purely as a wage-incentive system, it might seem less attractive for larger firms, where the incentive tends to be diluted more strongly (as argued in the Box). However, it is also more costly for large firms to monitor the performance of their workers, and this might lead them to consider profit-sharing as a way of encouraging workers to monitor each other. Larger firms may also be better informed about the variety of possible pay systems and have more resources to devote to their design. It must also be remembered that profit-sharing is more than simply a wage incentive system. It may also be one element of a policy of associating workers with the aims of their companies and this may also commend it to larger or highly decentralized firms, where such a policy is harder to implement.

ii) *Organisational structure*

Profit-sharing may have advantages in situations where employees have considerable discretion about their working methods, where their individual outputs are difficult to monitor and where efficient production necessitates a relatively high degree of co-operation.

It may be less useful where the work is machine-based. Thus, in general, its attractiveness is likely to vary according to the nature of the work and the way it is organised and monitored.

iii) *Structure of the workforce*

A higher proportion of white-collar workers might be associated both with greater difficulties in monitoring output – favouring recourse to profit-sharing – and with a greater average level of commitment to the firm, which would lessen the need for firm-wide incentives. In firms which rely heavily on part-time or casual employees, profit-sharing schemes might well be less frequent, both because their work is likely to be easier to monitor and because a high degree of commitment to the company is less important.

iv) *Industrial relations*

Some countries require the adoption of profit-sharing plans to be negotiated with the workforce. In such cases in particular, profit-sharing would appear to be easiest to introduce when there is a relatively high degree of trust between workers and management. Workers need assurance that the scheme will not lead to unexpected reductions in remuneration and that, in particular, management will not manipulate profit figures in order to reduce the bonus. On the other hand, when there is a high degree of trust, management might see less need to employ firm-wide incentive schemes.

The influence of a high degree of unionisation is also ambiguous. Unions have traditionally been hostile to profit-sharing, on the grounds that it may be used as a substitute for increases in basic pay levels and that it may weaken the community of interest between workers in different companies. However, unions may tend to prefer profit-sharing to other types of wage incentive schemes (such as gain-sharing). They may also be more in favour of profit-sharing if it is clearly in addition to basic pay.

v) *“EfficiencyWage” considerations*

Instead of being thought of as a direct incentive, profit-sharing bonuses might be used as an indirect one, by boosting pay above the “market rate”, and so raising the costs to the worker of being dismissed for shirking. Incentives such as this fall into the category of “efficiency wages” [Akerlof (1982)]. In this context, the introduction of profit-sharing has the advantage that it can replace permanent pay increases, which firms may be reluctant to grant, while signalling management’s intention to be generous if profits turn out to be high.

vi) Riskiness of the profit stream and wage levels

In general, firms will have a greater incentive to set up a flexible remuneration system when profits are particularly variable, in order to transfer some of the risks to workers. Profit-sharing provides a way of doing this – provided the bonuses are not simply an addition to the pay levels that would otherwise have been received. Such a strategy should appeal to firms who prefer to employ workers who are tolerant of risk. Employees, in their turn, may be more willing to accept the risks associated with profit-sharing if their basic wage levels are relatively high.

vii) The external environment

The advantages of introducing profit-sharing might vary according to the degree of competition from firms without profit-sharing. Levine and Tyson (1990) have noted that, as profit-sharing firms will pay varying wages, risk-averse workers will tend to leave them for employment in other firms. In addition, assuming that profit-sharing replaces part of basic wages, in a recession, remuneration in a profit-sharing firm may fall below that of non-profit-sharing competitors – who will tend to have greater recourse to lay-offs, redundancies and short-time working. The profit-sharing firm may then run the risk of losing its best staff to other firms, where the levels of pay are temporarily higher. However, it is not clear how important this argument will be in practice. In general, employees are less likely to change companies in a recession. In addition, if there appears to be a danger of losing staff, it is open to the management of the profit-sharing firm to change the parameters of the scheme in such a way as to increase their pay or bonus levels.

Profit-sharing may also be encouraged by competition from other profit-sharing firms. An example is given by the financial services sector in the United Kingdom in the late 1980s, where profit levels were high, profit-sharing was already well-established in many firms, and other firms indicated that they felt under pressure to introduce profit-sharing schemes themselves in order to retain staff [see CBI/Wyatt (1994)].

2. Empirical findings

Table 4.7 outlines the main results of a number of econometric studies attempting to identify the factors associated with the presence of profit-sharing and/or its introduction. They adopt various methods and use a range of types of datasets. Ideally, the specification should guard against reverse causality, especially for variables related to company performance. For example, an association between the presence of profit-sharing and a high level of productivity

might be due either to a tendency for more productive firms to introduce profit-sharing, or to positive effects of profit-sharing on productivity. One way of avoiding this problem is to take account of the characteristics of firms as they introduce profit-sharing, as is done by Pérotin and Fakhfakh (1993), Biagioli (1994), Del Boca and Ichino (1992) and Kruse (1993a). An alternative is to estimate the probability of profit-sharing simultaneously with the level of company performance. This is the approach of FitzRoy and Kraft (1987).

The results of these studies are quite mixed, as might be expected from the disparity in national circumstances, datasets and methods. However, some patterns emerge. The five studies making allowance for reverse causality, as well as some of the others, are in agreement about the importance of profitability and firm size. Thus, the advantages of profit-sharing for larger firms appear to outweigh any perceived dangers of free riding. Over the sample of studies as a whole, there is also fairly unambiguous agreement on a positive association of profit-sharing with higher proportions of higher-skilled workers, and, where this is mentioned, with relative wage levels. There is no clear link with productivity, nor with capital intensity.

The estimated impacts of unionization are particularly variable, reflecting the complexity of its effects. For the United Kingdom, Gregg and Machin (1988) find that the presence of unionization is negatively associated with financial participation schemes in general, but that strong unions appear to press for profit-sharing schemes as opposed to gain sharing. Kruse (1993a) offers a detailed analysis for the United States, distinguishing between firms having profit-sharing and firms introducing it. While profit-sharing firms in general were found to have lower levels of unionization, the presence of a union was found to increase the chances of the introduction of a cash-based plan.

E. IS THERE A RELATIONSHIP BETWEEN PROFIT-SHARING AND FIRM-LEVEL PRODUCTIVITY?

1. Theoretical considerations

In appropriate circumstances, profit-sharing might improve labour productivity by increasing employee effort and helping to associate workers with the aims of the company. In turn, the latter may improve information flows through the firm and foster longer-term attachments with companies, with consequent improvements in workforce organisation and skills [Defourny, Estrin and Jones (1985); Bradley and Gelb (1986); Kruse (1992)]. However, there are many reasons why such productivity gains might not be

Table 4.3. Characteristics of firms with profit-sharing (PS)

Study	Period	Data	Method	Findings
Canada				
Jones and Pliskin (1994)	1986 and 1987	313 private sector firms in 1986. 164 more in 1987 some over-representation of larger firms	Probit analysis of the probability of existence of profit-sharing, for production workers separately, with variables including industry, union density, total employment, total benefit costs capital-labour ratio, and indicators of labour relations	Presence of profit-sharing for production workers positively correlated with size of firm, negatively with union density and capital/labour ratio.
France				
Cahuc and Dormont (1992)	1986-1989	539 manufacturing firms with profit-sharing, control group of 1 484 enterprises without.	Tobit model for decision to use profit-sharing, with wide range of variables at enterprise level.	PS associated positively with base wage, ratio of social security contributions to wages, higher proportions of blue-collar and of professionals and capital stock, negatively associated with market share.
Pérotin and Fakhfakh (1993)	1988	Representative sample of 5 000 firms in industry and services	Estimation of probit equation where probability of introducing profit-sharing in 1988-1990 is a function of technological and risk factors observed in 1981-1988.	Among those larger firms required to have participation, larger, more productive firms in secure positions are more likely to introduce <i>intéressement</i> . Among smaller firms, less productive firms in riskier market positions are more likely to introduce <i>intéressement</i> .
Germany				
FitzRoy and Kraft (1987)	1977 and 1979	Interviews of 61 firms in the metalworking industry.	Tobit model for profit-sharing income per employee estimated simultaneously with total factor productivity.	PS incidence higher in relatively large, profitable, productive firms with lower capital intensity
Carstensen, Cerlach and Hubler (1992)	1989	Random sample of 103 manufacturing firms from Lower-Saxony and Baden Wurttemberg of which 12 profit-sharing firms, plus 33 profit-sharing firms from same regions.	Cross-tabulations of attitudinal survey, plus probit regression of profit-sharing dummy on investment, wages, market structure, skills, employment and industry and tobit estimations of determinants of profit-sharing level.	A majority of firms report improvement of productivity plus solidarity (fairness) plus recruitment of high skills as objectives of schemes Larger firms paying higher wages, with more skills and in more secure market positions have a higher probability of having PS and have a higher level of PS
Italy				
Biagioli (1994)	1982-1991	Random sample of 179 manufacturing companies from Emilia Romagna (35 with financial participation) Mediobanca accounts + union information on contracts.	Estimation of probit equation where probability of introducing profit-sharing is a function of size, state/private ownership, competitiveness, debt, investment, average labour productivity and industry.	Larger firms in more secure positions, with higher investment and lower productivity are more likely to introduce profit-sharing
Del Boca and Ichino (1992)	1982-1989	Random sample of 1 110 manufacturing firms from Lombardy with > 500 employees, of which 632 had used flexible compensation Accounts plus firm-specific variables from Mediobanca plus telephone survey on flexible compensation	Estimation of Cox proportional hazard model where chances of signing a flexible pay contract in given year depend on size, profits, investment labour costs, productivity and industry	Larger firms with superior profit margins, more investment, higher wages and lower productivity are more likely to introduce flexible compensation.

Table 4.3. Characteristics of firms with profit-sharing (PS) (Cont.)

Study	Period	Data	Method	Findings
United Kingdom				
Estrin and Wilson (1993)	1978-1982	87 small- to medium-sized firms in the UK engineering and metalworking sectors.	Logit function for existence of profit-sharing, with variables for product market competitiveness, labour force structure, industrial relations and firm-specific characteristics	Existence of PS is positively associated with variability in the firm's profit stream (significant at 99% level), and with indicators of employee influence, and more common in less competitive product markets, but less common in larger firms and in firms with a high proportion of blue-collar workers
Gregg and Machin (1988)	1984	The Workplace Industrial Relations Survey of 1984, detailed data on 2 019 establishments with 25 or more employees.	Probit likelihood function, including variables for organisation, industry and establishment, initially estimated with full interactions, then simplified	Financial participation schemes less likely to be present in union sector if unions are strong, but unionised establishments more likely to have a profit-sharing or share ownership schemes than to have gain-sharing
Poole (1988)	1985	Dept of Employment funded survey of profit-sharing and employee share ownership in Britain. For analysis, 822 cases were used.	Cross-tabulations of results from survey	PS more likely in presence of consultative managerial style of industrial relations. Larger firms best able to make use of APS provisions
Smith (1993)	1990	Dept of Employment, Inland Revenue and Treasury commissioned attitude survey into reasons for introduction and impact of Employee Share ownership schemes, replicating 1985 survey. Final survey consisted of 202 firms (53% with SPS)	Cross-tabulations of results from survey.	Although tax relief was often determinant for the introduction of employee share ownership, employee involvement was the main stated aim.
United States				
Cheadle (1989)	1981	Internal Revenue Service reports filed by just under 6 000 firms in 23 manufacturing, trade, finance and service industries.	Probabilities of deferred profit-sharing plan and/or defined benefit pension plan modelled by binominal logistic regressions.	Presence of DPS plan unrelated to firm size, negatively correlated with unionisation, positively with proportion of engineers, and PS more likely to be found in retail trade and finance.
Kruse (1993a)	1970-1991	500 public companies, half with PS, for employees matched against similar companies with no PS	Prediction of PS adoption made with both linear probability and binominal logit models.	Higher levels of unionisation, increases in profit-margins and stock prices found to increase the probability of PS adoption

realised. Overall, the theoretical literature is inconclusive – especially as it is difficult to specify what exactly determines company-level productivity. The range of arguments for why and how profit-sharing might affect productivity include the following.

i) *Increased employee effort*

The simplest argument is that, *ceteris paribus*, paying for observed performance might be expected to produce more output than paying for time at the job. However, as already noted, when performance is measured at the company level, it may be difficult for an individual employee to be convinced that there is

a connection between increased effort on his or her part and the bonus received. Nevertheless, profit-sharing may have incentive effects through encouraging individual workers in a firm to monitor each other's efforts, in order to improve their overall performance levels. This seems to be more likely in firms which have a generally co-operative and participatory atmosphere.

ii) *improved information flows*

If profit-sharing is implemented in a co-operative climate, it may contribute to a greater sense of identification of the workforce with the fortunes of the company. In such a climate, workers may be motivated to

make helpful suggestions based on their own expertise and knowledge. Freeman and Medoff (1984) have suggested that such "voice" effects may have a significant effect on firm productivity levels.

iii) Improved workforce skills

Profit-sharing, especially in the deferred or share-based form, may increase workers' desire to remain with the firm, both because of greater identification with the company and the extra tax advantages of deferring receipt of the bonuses [see CBI/Wyatt (1994) for a discussion of the job attachment effects of the various types of schemes in the United Kingdom]. Higher retention rates may be translated into higher productivity through the positive effects of long-term job attachment on workers' skills and knowledge. Increases in the average rate of capacity utilisation may occur as the average level of skill in operating and repairing machinery improves. Work groups should function better as knowledge of the strengths and weaknesses of specific workers builds up. Fellow workers may be more willing to help others learn on the job when they know that some proportion of the resulting increased profits will accrue to them. Finally, from the firm's perspective, lower labour turnover should reduce total annual employee recruitment and training costs (OECD (1993, Chapter 4)).

iv) Management efficiency

As suggested above, profit-sharing is most likely to have an incentive effect in firms with a generally co-operative and participatory atmosphere. However, from the management point of view, this can have disadvantages. Increased worker participation may lead to a reduction in the power and discretionary authority of managers. The cost of achieving consensus may be higher and the pace of decision making may be reduced. Furthermore, decisions might be less efficient, as stronger worker participation might lead to a tendency to favour short-term increases in remuneration over longer-term investments (Alchian and Demsetz (1972); Jensen and Meckling (1979)). However, in a participatory atmosphere, it may be easier to implement decisions, once they are made. In addition, profit-sharing may, in some ways, facilitate longer-term investment decisions. Under conventional remuneration systems with annual pay negotiations, employers must commit themselves to invest for planned, future levels of capacity, while workers can wait until the new equipment is installed before making wage demands for operating it. This may lead management to under-invest in new equipment. As profit-sharing, especially in deferred or share-based versions, links remuneration to future corporate performance, it may help to reduce this danger.

In some circumstances, profit-sharing might increase the risk of conflict between management and workers (Meade (1986)). Management usually has more knowledge of the information used to construct the company accounts, and that can give rise to concerns that they are manipulating the accounts in order to reduce the apparent levels of profits and so the size of the bonus. In general, workers may react negatively if profit-sharing confers simply responsibility without power, particularly when corporate performance is unsatisfactory. These problems could lead to requests for large amounts of information about company performance, taking up management time, followed by potentially serious conflicts over the drawing up of the company accounts. Once again, this danger is less likely to arise in participatory firms.

2. What is the empirical evidence on profit-sharing and productivity?

The range of published evidence includes attitudes of employers and employees towards profit-sharing schemes, econometric analyses and case studies. The results of a number of these studies are outlined in Table 4.4. Several of the econometric analyses attempt to handle problems of selection bias, such as any tendency for the more productive firms to be more likely to introduce profit-sharing and all allow for a range of other factors thought likely to be determinants of productivity and/or company performance. However, interpretation of the results is always difficult. Even after allowing for possible selection bias, any correlation between profit-sharing and productivity might be due to factors, unidentified in the model, which simultaneously lead to higher productivity and are associated with the presence of profit-sharing.

i) Evidence from attitude surveys

At least in the United Kingdom, there appears to be a widespread feeling among managers in firms which have introduced profit-sharing that it has a positive effect on employee attitudes, feeding through to higher productivity. For example, in 1985, the Wider Share Ownership Council surveyed 138 firms, some 50 per cent of which operated profit-sharing schemes. They found that most respondents thought there were small, but positive, effects on employee attitudes, most significantly through improved employee loyalty or more positive attitudes to change. The Industrial Participation Association also carried out a survey in 1985. Some 86 per cent of respondents agreed or strongly agreed with the suggestion that profit-sharing schemes are good for the company and employees. The idea that profit-sharing made employees take a greater interest in the com-

Table 4.4. **Impact of profit-sharing (PS) on firm productivity**

Study	Period	Data	Method	Findings
France				
Cahuc and Dormont (1992)	1986-1989	565 manufacturing firms 258 with PS.	Cobb-Douglas production function, including level of PS instrumented by predicted values from a tobit regression then by I.V. in levels and rates of growth.	PS has a significant, positive effect on productivity and growth.
Fakhfakh and Pérotin (1993)	1988	Representative sample of 5 000 firms in industry and services	Estimations of a translog production function with correction for heteroscedasticity and endogenised profit-sharing.	Profit-sharing has a positive significant disembodied effect (8% in single equation estimate, 6% when endogenised).
Vaughan-Whitehead (1992)	1983-1985	Postal survey by CEGOS and <i>Institut de l'Entreprise</i> . Final sample consisted of 116 manufacturing firms.	Cobb-Douglas production function without PS and then regression of residuals on PS and other financial participation dummies and controls.	PS and employee share ownership have significant positive effects (individual merit pay schemes have significant negative effects).
Germany				
Cable and Wilson (1990)	1977 and 1979	Interview/survey data on 52 firms in the engineering industry, 21 of the firms with PS schemes, compared with 31 non-PS schemes.	Various specifications of Cobb-Douglas production function, allowing for both embodied and disembodied PS effects.	Models incorporating interaction (embodied) terms dominated in model selection tests. These indicated overall productivity differentials of 20-30% in favour of firms practising PS.
Cable and FitzRoy (1980)	1974-1976	Interview/survey data of 42 West German firms belonging to the organisation AGB, which had introduced some form of workers' participation in decision-making or PS or both	Cobb-Douglas production function, testing the effects on value added of total profits distributed to workers. Firms also split according to their degree of worker participation in decision making (high and low).	In whole sample, the PS effect positive but statistically insignificant. Splitting the sample into high and low participation firms produced a significant, positive coefficient on PS for high-participation firms, and a negative, but insignificant coefficient for low-participation.
Carstensen, Gerlach and Hiibler (1992)	1989	Random sample of 103 manufacturing firms from Lower-Saxony and Baden Wurttemberg of which 12 profit-sharing firms + 33 profit-sharing firms from same regions	Regression of value-added per person on profit-sharing (dummy or levels), skills, wage, training expenditure, capital intensity, region and industry by ordinary least squares (OLS) then endogenising wages and level of profit-sharing.	Level of profit-sharing and profit-sharing per employee have positive significant effects on value added per employee. Ratio of profit-sharing to total profits has negative significant effect and presence of profit-sharing (dummy) has no significant effect.
Carstensen and Hiibler (1994)	1989	As above	Estimation of a Cobb-Douglas production function with profit-sharing dummy.	Profit-sharing has positive, significant effects embodied in capital; negative, significant effects embodied in labour and slightly net positive effects overall at sample means.
FitzRoy and Kraft (1987)	1977 and 1979	Interview/survey data on 61 firms working in 3 areas of the metal working industry, 30 of the firms with PS schemes, compared with 31 non-PS firms	Simultaneous weighted least squares (WLS)-Tobit estimates to determine whether total factor productivity is significantly affected by PS.	The simultaneous WLS-Tobit estimates indicated a highly significant (and robust) positive association between total factor productivity and the extent of PS.
Kraft (1991)	1977 and 1979	Interview/survey data on 79 firms working in 3 areas of the metal working industry	Productivity equation with (ln) total factor productivity as dependent variable. Dummy for PS.	PS has a positive impact on productivity. Piece-rates, conversely, do not.
Italy				
Biagioli (1994)	1982-1991	Random sample of 179 manufacturing companies from Emilia Romagna (35 with financial participation). Mediobanca accounts + union information on contracts.	Estimation of a Cobb-Douglas production function with financial participation dummy by generalised least squares (GLS) with fixed effects	Financial participation has a positive and significant disembodied effect of 2-17%

Table 4.4. **Impact of profit-sharing (PS) on firm productivity** (Cont.)

Study	Period	Data	Method	Findings
United Kingdom				
Bhargava (1991)	1987-1989	150 publicly firms with PS schemes	Ordinary least squares (OLS) and instrumental variable estimates of profitability, in levels and first differences.	PS has a positive and significant effect on profitability (both from estimates in levels and first differences).
Cable and Wilson (1989)	1978-1982	Interview/survey data on 52 firms in the engineering industry, 21 of the firms with PS schemes, compared with 31 non-PS schemes.	Various specifications of Cobb-Douglas production function, allowing for both embodied and disembodied PS effects.	Using estimates of the production function which include embodied effects of PS, productivity differentials of between 3 and 8% were found between those operating PS schemes and those without PS schemes.
Wadhvani and Wall (1990)	1972-1982	EXSTAT and DATASTREAM data on 101 manufacturing firms, 21 having operated a PS scheme at some time, compared with 80 non-PS firms.	Cobb-Douglas production function with PS dummy, interacted with capital stock	Some evidence of PS boosting productivity in that the coefficient on the PS dummy capital stock interaction was statistically significant, while the profit-sharing dummy indicated a 2.7%, although insignificant, increase in productivity for PS companies.
United States				
Conte and Sveinar (1988)	Not reported	Unbalanced panel of 40 firms incorporating 21 firms with employee stock ownership trust plans, 21 with a PS plan. 12 with direct ownership of capital by workers and 13 operating a worker participation scheme.	Production function estimated in translog form, using both OLS and instrumental variable techniques.	The PS coefficients were always positive in all specifications but not generally significant. They indicated higher productivity in PS firms of between 19% and 32%, depending on the specification
Kruse (1992)	1971-1985	CompuStat data and Form 5500 pension plan data on 2 976 publicly traded companies (1 198 of which were PS firms). Both PS and non-PS firms split into manufacturing and non-manufacturing.	Various specifications of Cobb-Douglas production function.	Adoption of PS associated with a productivity increase of 2.8%-3.5% for manufacturing companies and 2.5%-4.2% for non-manufacturing companies (all statistically significant except lower estimates of non-manufacturing companies). These increased to 7.9%-8.9% and 10.3%-11.0% respectively, when profit-sharing measured as a proportion of employees covered (all significant).
Kruse (1993c)	1970-1991	500 companies with public stock, half with PS, matched against similar companies with no PS.	Estimates of production functions with capital and labour inputs. Comparison of pre- and post- performance of firms adopting PS. Estimates controlled for a variety of influences on productivity.	PS adoption is associated with productivity increases of 3.5% to 5%. The average productivity increases are larger for smaller firms and those with cash plans. However, the results are highly dispersed, and provide little evidence as to the mechanism through which PS may affect productivity.
Kumbhakar and Dunbar (1993)	1971-1985	CompuStat data and Form 5500 employee benefit plan data on 69 firms adopting PS, with no change in other plans.	Cobb-Douglas estimation of production functions by various models.	All models support hypothesis of positive association between PS and productivity, the effect on productivity increasing with the age of the plan.
Mitchell, Lewin and Lawler (1990)	1983-1986	Survey responses on 495 business units matched to financial data contained in the CompuStat file. 37% of the business units had PS schemes, 5% gain-sharing, 42% ESOPs and 19% stock options.	Regression estimates of economic performance (return on investment, return on assets and productivity) equations. PS measured by dummy variable.	The evidence suggest that the use of PS was associated with both higher productivity (statistically significant at 5% level), and improved firm performance.
Shephard (1986)	1975-1982	20 publicly traded chemical firms - 9 with PS schemes compared with 11 non-PS schemes.	Production function framework with value added as dependent variable. CES production function was approximated to determine whether PS was labour or capital augmenting.	PS firms had around 10% higher productivity than non-PS firms. PS was found to influence productivity primarily through its effect upon labour effort.

pany was agreed or strongly agreed with by 66 per cent of respondents, while 65 per cent agreed or strongly agreed that it created a better atmosphere in the firm. Turning to issues of labour turnover, however, only 47 per cent of respondents agreed or strongly agreed that profit-sharing strengthened workers' loyalty to the firm, as against 34 per cent who disagreed. On the basis of Inland Revenue (1993), Smith (1993) concluded that these reasons for introducing schemes had changed little over the period 1985-90.

ii) Evidence ~~from~~ *econometric analyses*

The standard econometric test for productivity effects uses a variable controlling for profit-sharing with an appropriately specified production function. The problem of reverse causality, noted above, may be resolved by estimating the production function jointly with a "selection" equation determining which firms are likely to exhibit profit-sharing. This is the approach used in several of the studies in Table 4.4. The papers cover France, Germany, Italy, the United Kingdom and the United States, and range from large industrial firms to small service activities.

Overall, despite the limitations of many of the studies, the consistency of the findings is remarkable. Profit-sharing is associated with higher productivity levels in every case, regardless of methods, model specification and data used. This was also the conclusion of the extensive survey of a wider range of analyses for the United States by Weitzman and Kruse (1990).

While the direction of the results is consistent, the magnitude of the productivity advantage varies considerably across studies, as might be expected, given that profit-sharing has been introduced in a widely-ranging set of circumstances. For example, for the United States, an initial analysis by Kruse (1992) of around 3 000 publicly traded companies suggested that profit-sharing would increase productivity by around 3 per cent. However, a respecification of the equation (to measure the incidence of profit-sharing in terms of the proportion of employees covered) led to an estimated increase of between 8 and 10 per cent. Again for the United States, Conte and Svejnar (1988) concluded that the productivity advantage of profit-sharing firms might lie between 19 and 32 per cent, the figure varying with the specification. (Only the specification leading to the figure of 32 per cent gave a statistically significant result.) For the United Kingdom, Wadhvani and Wall (1990) found evidence of a disembodied productivity enhancement of around 3 per cent, as well as significant capital-embodied productivity enhancement, while Cable and Wilson (1990) arrived at estimates varying between 3 and 8 per cent.

Only Kruse (1993a) tests whether the introduction of profit-sharing has a once-for-all or a continuing effect on productivity and his results are inconclusive. There is thus no evidence here for or against the proposition that the adoption of a scheme leads to a long-run change in the rate of productivity growth.

F. IS PROFIT-SHARING ASSOCIATED WITH LOWER EMPLOYMENT VARIABILITY?

One of the traditional arguments in favour of profit-sharing is that it can reduce the variability of employment, by acting to increase the variability of wage payments. From this perspective, profit-sharing is an arrangement to increase money wage flexibility over the business cycle, and thereby to reduce the level of unemployment attained during downturns. Profit-sharing is, of course, not the only way to achieve lower cyclical variability in the number of people employed. European countries generally have systems of employment protection legislation coupled with arrangements to compensate workers for short-time working, designed to provide a cushion for employment during periods of temporary economic difficulty [Grais (1983); OECD (1993)].

1. What does the empirical evidence conclude?

The results from the sparse existing literature are summarised in Table 4.5. The papers cover France, Germany, the United Kingdom and the United States. The hypothesis of reduced employment variability is difficult to test. In addition, not all of the studies cover a period long enough to examine cyclical effects properly.

For the United States, the findings seem to lean in the direction of supporting the proposition that profit-sharing acts to reduce employment variability. However, clear-cut statistical results are lacking.

For France, Cahuc and Dormont (1992) find that profit-sharing has no effect on employment variability (although the figures cover only a period of economic growth). The evidence for Germany is positive, but is derived from a relatively small sample of manufacturing firms and relates only to dismissal rates. The results for the United Kingdom depend on the study. Bradley and Estrin (1992) find clear evidence for increased wage variability and reduced employment changes relative to competitors in their case study of the John Lewis Partnership. EPW reach similar conclusions from their analysis of a sample of 52 firms over the period 1979-82. However, Wadhvani and Wall (1990) find little support for the proposition in their data set of manufacturing firms.

Table 4.5. **Impact of profit-sharing (PS) on employment stability in firms**

Study	Period	Data	Method	Findings
France Cahuc and Dormont (1992)	1986-1989	565 French manufacturing firms, 258 with profit-sharing.	Estimation of (ln) employment equation in levels and growth rates with lagged employment and PS level endogenous	PS has insignificant or negative (in levels estimation) effect on employment
Germany Kraft (1991)	1977 and 1979	Interview/survey data on 70 firms working in 3 areas of the metalworking industry	Dismissal equations with PS dummy.	PS firms have lower dismissal rates.
United Kingdom Bradley and Estrin (1992)	1970-1987	1 British PS firm in the retail sector, compared with 4 comparable "first division" firms.	Simultaneous estimate of (ln) labour demand function with remuneration equation Differences between the PS firm and the other retail firms tested using firm-specific dummies.	The effects of PS on employment hinge on the sign and significance of the four firm-specific dummy variables. All are negative and two are statistically significant at the 95% level. The estimated coefficients on these dummies are relatively large, between 0.1 and 0.36. This implies that, at given levels of remuneration, employment in the PS firm is up to 30% greater than in the other firms
EPW [Estrin <i>et al.</i> (forthcoming, 1995)]	1978-1982	52 small- and medium-sized firms in the metalworking industry, of which 21 PS firms	Labour demand equation estimated simultaneously with remuneration equation, both in rate of change form, with dummies for PS	PS associated with stronger variation in remuneration, though no significant direct effect on employment. Changes in remuneration have significant, negative effect on employment changes
Wadhvani and Wall (1990)	1972-1982	EXSTAT and DATASTREAM data on 101 manufacturing firms, 21 having operated a PS scheme at some time, compared with 80 non-PS firms.	Logged employment equation with demand shock given by change in industry output and PS dummy interacting with industry output variable.	A small responsiveness to demand shocks requires that the coefficient on the change in industry output be smaller for PS firms. Coefficient values 0.35 for non-PS and 0.44 for PS, (t-test for difference = 0.49) suggest there is little difference in their employment response to demand shocks. Indeed, employment in PS firms seems to respond more (not less) to demand shocks.
United States Bell and Neumark (1993)	1978-1987	204 publicly traded firms with union contracts. 35 firms with lump sum payments, 17 with PS plans, and 156 firms with neither scheme	Labour cost growth regressions, and employment growth regressions with PS dummy	PS reduces labour cost growth by about 5% per year. Statistically weak evidence that PS increases employment growth and reduces employment variability
Chelius and Smith (1990)	1977 and 1987	Two data sets: (i) employer data from two surveys (1988) by the National Federation of Independent Businesses, and the PS Council of America, totalling 3 988 firms, of which 33% had some form of PS scheme, (ii) household data from the Quality of Employment Survey (QES) 1977, totalling 404 firms, of which 25% had PS schemes	Logged cross-sectional employment equation incorporating PS as dichotomous variable	In both data sets, there was support for the hypothesis that workers whose pay is partially in the form of PS have greater security in the face of business downturns. However, the level of statistical significance was marginal (0.10 level with one-tailed tests) and there was a tendency for this result not to be distributed uniformly across all employers

Table 4.5. **Impact of profit-sharing (PS) on employment stability in firms** (Cont.)

Study	Period	Data	Method	Findings
United States (Cont.)				
Florkowski (1991)	1971-1987	516 publicly traded firms	Repeated ANOVA technique with PS dummy comparing employment stability pre- and post-adoption of deferred PS plan.	Greater post-adoption employment stability was revealed only in 5 and 6 year comparisons.
Kruse (1992)	1971-1985	CompuStat data and Form 5500 pension plan data on 2 976 publicly traded companies (1 198 of which were PS firms).	Pooled time-series/cross-sectional employment growth equation (logged and first-difference).	PS manufacturing firms found to have smaller employment decreases than other manufacturing firms during business downturns. When the unemployment rate increased by one point, PS manufacturing firms decreased employment by 2%, compared with 3.1% decrease for non-PS manufacturing firms. These findings did not extend to the non-manufacturing sector.
Kruse (19936)	1970 and 1991	500 companies with public stock, half with PS matched against similar companies with no PS.	Employment equations control for growth trends, and separately examine positive and negative demand shocks using three different measures of such shocks.	PS firms had stronger employment responses to positive shocks, and smaller responses to negative shocks than the non-PS counterparts. The results in general were favourable to the view that PS firms have more stable employment.

G. IS PROFIT-SHARING ASSOCIATED WITH HIGHER LEVELS OF EMPLOYMENT IN FIRMS?

I. Theoretical considerations

One argument for expecting profit-sharing to lead to higher employment in firms that operate it, compared to otherwise similar firms that do not, has been made widely known through the work of Martin Weitzman. It is based on two assumptions. The first is that, in a profit-sharing firm, management will regard the base wage, rather than total remuneration (base wage plus profit-sharing bonus), as the marginal cost of labour. The reasoning is that the hiring of an additional worker will simply require management to pay an additional unit of basic wages, the other component of the total wage bill, the share of profits allocated to workers, being independent of the level of employment. The second assumption is that, in profit-sharing firms, the base wage is lower than the market wage. If these assumptions hold, firms with profit-sharing should hire more labour than other firms.

The argument is clearly open to question. The first assumption relies on the proposition that management is free to set employment levels as it pleases. However, other things being equal, an addition to the workforce will dilute the profit-sharing bonus being paid to each of the existing workers, who are thus likely to resist extra hirings. If wages, and perhaps employment as well, are subject to bargain-

ing between employees and management, the argument is unclear. In addition, it is uncertain to what extent profit-sharing bonuses do replace part of the basic remuneration in practice. For the United Kingdom, Wadhvani and Wall (1990) and Bhargava and Jenkinson (1995) find that profit-sharing payments tend to supplement basic wages. However, Bell and Neumark (1993) suggest that the introduction of profit-sharing reduces U.S. labour cost growth.

Empirically, the validity of the assumption that management in profit-sharing firms regards the base wage as the marginal cost of labour can be tested using a sample of profit-sharing firms and estimating the sensitivity of employment levels to changes in the base wage and profit-sharing bonuses, respectively. If the assumption holds, the sensitivity to changes in the levels of the profit-sharing bonuses should be lower.

Other empirical studies have made a more direct test of the effects of profit-sharing on employment levels by estimating labour demand equations across a mixed set of profit-sharing and non-profit sharing firms, with a dummy variable to account for any effects of profit-sharing, and controls for the characteristics of the firms involved.

2. Empirical evidence

A number of empirical studies using one or other approach are reviewed in Table 4.6. The results are often hard to interpret – it is always possible that a

Table 4.6. **Impact of profit-sharing (PS) on the level of employment in firms**

Study	Period	Data	Method	Findings
France				
Cahuc and Dormont (1992)	1986-1989	565 French manufacturing firms, 258 with profit-sharing.	Estimation of (ln)employment equation in levels with lagged employment and PS level endogenous.	<i>Intéressement</i> has insignificant or negative effect on employment level.
Vaughan-Whitehead (1992)	1983-1985	Postal survey by CEGOS and <i>Institut de l'Entreprise</i> . Final sample consisted of 116 manufacturing firms.	Log-linear labour demand equation with PS bonus level and dummy.	Employment level is negatively affected by the bonus, although less than by the base wage, and positively affected by the presence of a PS scheme. This positive effect is attributed to productivity improvements.
United Kingdom				
Blanchflower and Oswald (1988)	1980-1984	Data on some 2 019 firms interviewed as part of the Workplace Industrial Relations Survey of 1980 and 1984. These were divided by the presence of a PS scheme (834 without PS, 210 with); a SPS scheme (787 without, 257 with); and a value-added bonus (884 without, 160 with).	Cross-tabulations of percentage change in employment over the period by type of profit-related pay.	No evidence of correlation between employment level and any type of PS scheme.
Bradley and Estrin (1992)	1970-1987	1 British PS firm compared with 4 comparable "first division" firms in the retail sector.	Simultaneous estimate of (ln) labour demand function with remuneration equation. Differences between the PS firm and the other retail firms tested using firm-specific dummies.	Neither the base wage nor the bonus significantly affected employment in this sector; the main determinants being sales, the structure of employment and firm-specific characteristics.
Estrin and Wilson (1993) (as quoted in EPW)	1978-1982	21 small-and medium-sized PS firms in the metal working industry	Labour demand equation including base wage and PS bonus estimated in rate of change form, with time and firm/industry effects and endogenised wage/bonus levels.	Support for hypothesis that PS firms regard base wage, rather than total remuneration as marginal cost of labour.
Jones and Pliskin (1989)	1890-1975 (excluding 1940-1945)	Data collected on 127 firms (3 411 observations) from two data sets, one for PS firms, the other for fixed wage firms. Both data sets covered the same three industries: printing, footwear and clothing.	Log-linear employment equation incorporating industry dummies and measures of PS and worker participation in decision-making.	Employment effects were sometimes found to be significant, but this depended upon the measure of PS, how the dynamics were modeled, and whether measures of employee participation in decision-making were included. PS measured as a dummy variable was found to give poor results. Using a continuous measure of PS, employment was found to be between 6% lower and 6% higher in PS firms.
Wadhvani and Wall (1990)	1972-1982	EXSTAT and DATASTREAM, data on 101 manufacturing firms, 21 having operated a PS scheme at some time.	Estimate of (ln)employment equation and stock returns equation.	Estimates suggested that under a PS system, the firm views the total remuneration (and not just base wage) as the marginal cost of labour.
United States				
Kruse (1993b)	1970-1991	500 companies with public stock, half with PS matched against similar companies with no PS.	Labour demand equation, relating employment levels to cost of labour, augmented to separate PS from other compensation. PS measured as percentage of payroll.	The estimated employment effects of wages and PS payments were generally consistent with the idea that employers do not view PS payments as part of the marginal cost of labour. However, alternative measures for removing bias from the estimates showed them to be rather sensitive.

positive effect on employment may stem from a positive influence on productivity which, in turn, favours growth of the enterprise. Overall, the picture is inconclusive.

Regarding the proposition that management in profit-sharing firms regard the base wage as the marginal cost of labour, Vaughan-Whitehead (1992) finds some evidence in favour for France, and the same is true for the United States according to Kruse (1993*b*) (although his results are rather sensitive to alternative specifications). For the United Kingdom, Estrin and Wilson (1993) find evidence for the proposition, but Wadhvani and Wall (1990) arrive at the contrary result.

As to the more general question of whether profit-sharing is associated with higher employment levels, for France, Cahuc and Dormont (1992) and Vaughan-Whitehead (1992) reach conflicting conclusions. For the United Kingdom, Blanchflower and Oswald (1988) find little evidence that profit-sharing affects the employment decision, while the results of Bradley and Estrin (1992) and Jones and Pliskin (1989) are largely inconclusive. The results of Bell and Neumark (1993) for the United States (see Table 4.5), tend to support the proposition, but are not statistically significant.

H. CONCLUSIONS

What policy conclusions might be drawn from the results presented in this chapter? Its main conclusion is that firms with profit-sharing tend to display higher levels of productivity than comparable firms without. However, by itself, higher productivity is not necessarily an argument for outlays from the public purse. When a firm raises its level of productivity, most, or all of the ensuing benefits accrue to the firm concerned.

Two other findings of this chapter are relevant to the question of public policy support for profit-sharing. It has been claimed that profit-sharing should increase the flexibility of wages over the economic cycle, and thus reduce the volatility of employment. This could have at least two beneficial effects. First, it would reduce the maximum level of unemployment. Second, it would increase the degree of attachment between employees and their companies,

encouraging skill formation. However, the evidence for this proposition is weak, especially in Europe. Another argument is that profit-sharing should tend to raise levels of employment in firms that operate it. On this point, the evidence is also inconclusive. Of course, it is possible that, in one or both cases, more positive results will emerge as profit-sharing becomes more widespread and research continues.

This review does, however, suggest that there may be a case for limited public support to inform firms about the potential advantages of profit-sharing and the circumstances that are necessary for its introduction to be successful. Overall, the incidence of profit-sharing in OECD countries is still comparatively low despite recent growth in some cases. Only in a few countries is the proportion of employees covered much over 5 per cent, and in several countries such schemes are almost unknown. Given its potential benefits, this is surprising and underlines the importance of efforts to encourage the flow of relevant information. In addition, there is a need for more information about appropriate ways to introduce profit-sharing, in different types of companies and in different national circumstances. For example, some studies have noted that productivity gains are more likely to occur in firms with a participatory atmosphere. While this review has concentrated on the effects of profit-sharing, it is also important to consider the potential costs involved in introducing it. These costs can be substantial. They will involve the managerial costs of administering the scheme, convincing the workforce of its merits, and inculcating the right working climate for it to be most beneficial.]

Finally, to return to a point made at the beginning, while this chapter has addressed profit-sharing and its effects primarily in terms of wage-incentive systems, its implications are wider than that. Particularly when used in conjunction with other measures, it provides a way of associating employees more strongly with the affairs and fortunes of their companies. From an economic point of view, this may become more important in the years to come, as increased competition and modern production techniques demand more concerted and co-operative efforts from the workforce as a whole.

Notes

1. The chapter draws very heavily on a paper, Estrin, Pérotin and Wilson (forthcoming, 1995) commissioned by the Secretariat [and referred to below as "EPW"] which in turn drew on a literature review carried out by Mr. Andrew Robinson. It also incorporates further work carried out by Mme Virginie Pérotin, acting as consultant to the Secretariat in collaboration with Professor Saul Estrin, and on the Impact on Profit-sharing in Europe (IPSE) project.
2. In addition to the sources cited, a number of national experts were consulted during the preparation of this section, as follows:
 - Australia: Mr Steven Oxley, Department of Employment, Education and Training.
 - Austria: Mr Thomas Delapina, Chamber of Labour.
 - Belgium: Professor Francine Van Den Bulcke, Katholieke Universiteit Brussels.
 - Canada: Professor Richard J. Long, College of Commerce, University of Saskatchewan.
 - Denmark: Professor Kirsten Bregm, Roskilde Universitetscenter.
 - Finland: Mrs Raili Hartikka, Ministry of Labour.
 - France: Mme Virginie Pérotin, I.L.O.
 - Germany: Dr Vivian Carstensen, Institut für Quantitative Wirtschaftsforschung, Universität Hannover.
 - Iceland: Professor Thorolfur Matthiasson, University of Iceland.
 - Italy: Professor Mario Biagioli, Università degli Studi di Modena.
 - Japan: Professor Fumio Ohtake, Osaka University.
 - Mexico: Lic. Jesús Martínez Torres, Secretaria del Trabajo y Previsión Social.
 - Netherlands: Professor Michael J. Ellman, University of Amsterdam.
 - New Zealand: Mrs Sylvia Dixon, Department of Labour.
 - Norway: Dr Erling Barth, Institute for Social Research.
 - Portugal: Dr Alberto Castro, Universidade Católica Portuguesa, Porto.
 - Sweden: Mr Lars Nyberg, Landsorganisationen i Sverige.
 - Switzerland: M. Dominique Babey, OFIAMT.
 - Turkey: Dr Mehmet Ali Gurol, Prime Minister's Office.
 - United States: Mr David Wray, Profit Sharing Council of America.
3. Although profit-sharing is widespread in Japan, the available information does not fit easily into the format of Table 4.1
4. In more detail, in April 1995, the rates of employee social security payments on wages were set at 8.25 per cent with respect to pensions and 0.55 per cent for unemployment insurance, while the corresponding rates for bonus payments were 0.5 per cent and zero per cent. (The advantages of lower social security payments are offset to some extent by reductions in entitlement to social security benefits.) For the employer, the corresponding payments were lowered from 8.25 per cent and 0.9 per cent, to 0.5 per cent and zero per cent, respectively. In addition, payment in the form of bonuses permits deferment of corporation tax for one year on the amount concerned (this relief is capped by the level of the bonus of the previous year).
5. Recent figures, from a survey by the Japanese Federation of Employers Association, indicate that, from 1987 to 1993, the percentage of firms with formula-based profit-sharing rose by about a quarter.
6. The Ajinomoto food company is a typical case. The total bonus is normally 2.5 times the basic monthly wage plus a profit-sharing bonus calculated as 10 per cent of current profits, shared out among individual members of the workforce in proportion to their basic wage, with an adjustment for the individual performance of the worker. If the worker's wage is 10 per cent above the firm average and his or her performance assessed at 15 per cent below, the profit sharing bonus is 10 per cent of profits, divided by the number of workers in the firm, multiplied by 1.10 and then again by 0.85.
7. Dore *et al.* (1989) add that, Koshiro also quotes calculations from time-series derived from data on individual firms rather than industry averages. The highest figures for profit elasticity were those of a chemical company at 0.09.
8. The empirical literature suggests that special reasons for this development included the trend towards the decentralisation of wage bargaining; the perceived need for a more co-operative attitude among workers; and an increasing profitability of companies, stemming from the decreasing use of wage indexation. See for example, Biagioli (1992), Prosperetti and Cossentino (1989), Cossentino and Prosperetti (1991), Costa (1991), Danieli and Ghidoni (1990), Della Rocca (1991), Della Rocca and Ponzellini (1987), and Uvalic (1991).
9. In Denmark, according to information provided by Professor Kirsten Bregm, a government report on "voluntary profit-sharing" concluded that 5 to 6 per cent of employees in private urban trades were included under some form of profit-sharing arrangement. However, a significant part of this is likely to have referred to schemes that would fall outside the standard definition, including various types of "gain-sharing" schemes.

10. While it is true that the average levels of both union density rates and union coverage rates are lower in the nine countries just mentioned than in the remaining countries, there are a number of exceptions, including France (for the coverage rate alone) and Germany.
11. British evidence shows that a significant number of firms abandon a profit-sharing scheme because they are not convinced its benefits outweigh the total costs, including managerial costs, of running it [CBI/Wyatt (1994)].

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