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Profits and Rates of Return in OECD Countries

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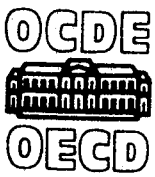

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PROFITS AND RATES OF RETURN IN OECD COUNTRIES

by

James H. Chan-Lee and Helen Sutch

General Economics Division*

* We gratefully acknowledge the helpful comments received from national officials and from many colleagues, and in particular the assistance of Messrs. D.W. Blades and T.P. Hill, who contributed the bulk of Annex I. The constructive criticism and guidance of Mr. Gerald Holtham were invaluable. Responsibility for interpretation and analysis remains our own.

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PROFITS AND RATES OF RETURN IN OECD COUNTRIES

I. INTRODUCTION

1. There is widespread concern, particularly in Europe, about the possibility of a secular decline in profits and rates of return. The purpose of this study is to assess whether there has been a decline and to quantify it as far as possible, taking measurement problems into account. It also considers summarily the significance of observed trends and the reasons for them.

2. Profits are generally seen as an essential feature of market economies. When they are low, it is feared that enterprise and innovation will falter and the rate of investment decline, leading to sluggish growth in output and capacity. Low growth may also lead to low profits. The precise links between profits and economic performance are, however, theoretically complicated and difficult to establish empirically. This is because both economic and accounting definitions of profit cover heterogeneous phenomena and are calculated as a residual.

3. Conceptual and measurement issues are important in assessing the evolution of that residual. These are addressed in Section II where the notion of the operating surplus and other profit concepts are introduced. The main emphasis of the paper is on profit shares and rates as a measure of the aggregate real return to productive activity in the economy. However, profits are also considered from the point of view of the firm, which requires inflation and tax issues to be taken into account.

4. Section III presents the empirical evidence on whether there has been a secular decline in profit shares and rates of return. This is done at three levels of aggregation: the total business sector, industry and transport, and manufacturing. In most countries and sectors, since the 1960s, there appears to have been such a decline, most pronounced in the manufacturing sector (see Table 1). Rates of return have declined more than profit shares, implying capital productivity is a key explanatory factor. Some evidence is also presented on profitability as perceived by firms, particularly in the 1970s. In a final part, prospects for profit shares and rates of return are briefly explored on the basis of the Secretariat's short-term forecast and a medium-term scenario.

5. Section IV discusses the theoretical problems which arise in attempting to isolate the determinants of the decline in profits and rates of return. Some potential causes are considered in the light of aggregate data.

Table 1

PROFIT SHARE AND RATES OF RETURN IN MANUFACTURING

(Per cent)

		1960s average	1970s average	1982	1983 estimate
United States	I	27.1	24.9	21.1	25.2
	II	22.2	16.8	10.6	12.9
Japan	I	55.9	47.6	44.3	44.0
	II	36.5 (a)	26.4	21.5	22.2
Germany	I	36.3	30.7	26.6	29.5
	II	20.9	15.7	11.7	12.9
France	I	33.3	32.3	25.1	27.0
	II	15.6	16.0	9.5	9.9
United Kingdom	I	32.2	23.6	21.5	24.5
	II	13.6	8.1	5.5	6.4
Italy	I	39.4	32.7	35.3	34.2
	II	18.3 (b)	15.3	16.1	14.5
Canada	I	33.7	32.1	24.7	29.3
	II	15.2	13.1	6.7	8.4
Belgium	I	..	27.7	23.6	27.2
	II	..	13.7	12.8	15.8
Finland	I	38.0	36.0	34.3	36.6
	II	..	12.8 (e)	12.7	14.0
Norway	I	27.9	29.1	25.5	28.1
	II	8.1 (c)	8.9	5.5	5.8
Sweden	I	29.6	22.7	23.7	29.9
	II	11.6 (d)	7.9	5.9	7.7

Note: I = profit share: gross operating surplus as a percentage of value added.

II = rate of return: gross operating surplus as a ratio of the gross capital stock.

a. 1965-69. b. 1961-69. c. 1962-69. d. 1963-69. e. 1971-79.

II. WHAT ARE PROFITS AND WHY DO THEY MATTER?

6. Different definitions of profit exist together with different techniques of measurement; the appropriate measure depends on the question being addressed. The following section sets out some general conceptual and measurement problems and examines the ways in which they are complicated in the presence of inflation.

Conceptual and measurement problems

A. Profits in theory and recorded profits

7. Profits can be looked at from the level of the firm, sector, or economy; gross or net; pre- or post-tax; before or after the deduction of factor payments to capital; ex ante or ex post; as profits in relation to production or, more broadly, as the surplus of total current receipts over current payments. This paper attempts to indicate the measures appropriate for different purposes. An observation at the outset is that a measure of the economic profitability of production in an economy may differ markedly from the profit conditions which firms perceive and to which they respond.

8. The role of profits is conceptually clearest at the level of the firm, seen as a basic decision-taking unit for economic activity. However, gross profits of the firm -- revenue minus wages and costs of other intermediate inputs -- cover a number of conceptually different items. They include an equilibrium return to factors employed: interest costs, a return to "enterprise" or "management", and in some cases the labour income of the self-employed. These are usually termed "normal profits". Any surplus over and above this represents rents or "super-normal profits" which can derive from monopoly or from the quasi-rents of semi-fixed factors like capital stock. In long-run competitive equilibrium these super-normal profits would be competed away, leaving only the minimum return necessary to keep factors in place. However, in practice the degree of competition varies and there are continual interruptions to the process from the introduction and diffusion of new technology and other shocks. Observed data therefore reflect a series of adjustment paths in which the level of profits at any one time is a function of the stage of disequilibrium, and the division between normal and super-normal profits cannot readily be identified.

9. From the point of view of the firm, the relevant concept of profit for undertaking new activities is future or expected after-tax profits, after normal costs (including normal capital costs) have been deducted, allowing for a risk premium (which will vary with the type of market). Hence ex ante super-normal profits after tax are the concept appropriate to the investment decision. However, they are not directly observable; nor are expected future costs, or the risk premium. While theoretically clear, the role of ex ante marginal profits and associated costs and risks is thus not easily amenable to testing or to incorporation in econometric models.

10. The adjustment of ex-ante profits for taxes also presents formidable problems. The structure of corporate taxes, subsidies and concessions in most countries varies according to the sector, region, type of asset or means of

financing production and investment. Aggregate tax receipts are subject to variable delays with respect to the profits being taxed, so current corporate tax payments rarely reflect current or even recent profits on a consistent basis. However, something may be inferred from trends in the two aggregates (see Section III.D).

11. Further difficulties occur because economies are not in steady state growth and specific account should be taken of time profile. In a dynamic context super-normal profits represent the present value of the future income stream to the firm, when discounted at a rate which is equivalent to the cost of capital. Alternatively, the internal rate of return is that discount rate at which the present value of future net income is zero. The difference between this rate and the rate at which financial capital is obtained is a measure of super-normal profits available. In principle, activities will be undertaken and new investment made to the point where the internal rate of return on the marginal project equals the cost of financial capital plus an allowance for a risk premium. Even if expectations are fulfilled so profits are equal ex ante and ex post it is not simple and may be impossible to infer internal rates of return from recorded profit rates ratioing measured profits to some measure of capital employed (see Annex I).

12. Recorded profits ex post for all these reasons are rather remote from the concept of profit most relevant to the firm in making investment decisions. However, they are important for several reasons. In the absence of observable evidence on ex ante profits, current profits may be taken as a guide to expected future returns. They may also act as a cushion should expectations be falsified, making it more likely that high-risk investment will occur. Furthermore, if the firm has a range of plant and equipment yielding different returns, that part of current profits that can be ascribed to each plant will be essential in calculating its viability and will therefore help to determine which plant it is worthwhile to operate. This consideration is relevant for current employment as distinct from the employment generated by new investment responding to expected future returns. Finally, profits ex post are important as a source of finance. In principle, if capital markets functioned "perfectly", this aspect would be irrelevant as finance would always be forthcoming for projects with an expected rate of return equal to or exceeding the interest rate. In practice, markets lack the information required to be perfect in that sense and retained earnings are an important source of finance. Given transactions costs in raising finance, internal funds may also be cheaper to the firm and their use may reduce the risk of a loss of control to creditors if investments are unsuccessful. Even with internal finance, of course, the interest rate retains some importance as a measure of opportunity cost in financial investments.

13. Thus, although ex ante supernormal profits after-tax may be crucial, observed ex post profits also have economic significance for decisions on economic activity and investment.

B. Profits and price changes

14. When price changes are taken into account, a distinction emerges between operating surpluses and revaluation surpluses, or operating profits and holding gains. The operating surplus is precisely defined in national accounts as the profit generated by engaging in the production of goods and

services. It is part of the value added which is created by transforming inputs into outputs of goods and services.

15. A holding gain, on the other hand, is the profit which accrues by holding a good from one period to another without subjecting it to any kind of transformation. It does not reflect the outcome of a productive process but depends simply on changes in prices, especially that of the good which is held relative to the prices of other goods and services.

16. Thus, the two kinds of profit are quite different in principle, the one reflecting the outcome of productive activity while the other reflects the outcome of doing nothing. In practice, they are hard to separate. As processes of production typically require stocks of durable and non-durable goods to be held, the decision to engage in production also involves a decision to hold significant quantities of stocks.

17. The profits figures analysed in this report are mainly aggregate data derived from national accounts. They are, in fact, operating surpluses - the residuals in production accounts as distinct from more general profit and loss accounts which include other receipts or charges not linked to processes of production (1). This operating surplus is the concept of profit necessary to establish the profitability of production. Its calculation at micro and macro level is further discussed in Annex 1.

C. Rates of return to companies

18. The economic definition of the rate of return and its relation to measured profit rates on production is discussed in Annex I. Generally in this paper profit rates are measured as operating surpluses unadjusted for depreciation divided by a measure of gross capital stock at current or replacement cost. It was argued above that expected super-normal operating profits were most relevant to investment decisions but that actual ex post profits were important for several reasons. Some of these reasons entail that overall profitability rather than the profitability of production alone has importance, for example in providing finance to companies. Price changes and changes in net worth have economic effects -- quite apart from the problems of measurement they create.

19. Real holding gains have been of considerable significance in the 1970s. Inflation and especially changes in the rate of inflation appear to have been responsible for changes in the actual as well as the measured behaviour of profits and rates of return through the associated changes in interest rates and the revaluation of assets and liabilities. This would not show up in national accounts even for the whole economy but in addition such effects in general redistribute income between sectors of the economy, for example between financial and non-financial enterprises. This can have further repercussions on activity.

20. The aggregate impact of inflation and relative price changes will have different effects on firms depending on their capital intensity, the balance between fixed and working capital, their gearing, the term structure of their debt, the extent of tax deductibility of borrowing costs and profits, and the importance of permitted inventory valuation adjustments. For instance, firms with a large debt burden gain relatively more from the devaluation of

liabilities under higher inflation. On the other hand, measurement of the depreciation of the capital stock at historic cost and of stock appreciation with conventional accounting methods overstates profits for tax purposes, leading to a higher real tax burden. To take these effects into account, including possible redistributions of profit income between risk-takers and pure savers, one approach is to look at total business income relative to total net assets, or, in other words, the rate of return on equity. This is done in Section III.D.

21. Firms no doubt take account of all profits including holding gains. Their view must also be influenced by historic cost accounting, which is generally used in commercial accounting, and which tends to obscure the realised rate of return to productive activity. In investment appraisal firms will abstract from a general inflation that does not alter relative prices but historic cost rates of return are presumably widely used in assessing past performance. They may therefore influence a range of business decisions via the perceived credit-worthiness of a firm and the terms on which it obtains finance. Historic cost profits also serve as a basis for tax liability.

22. Rates of return at historic cost are obtained by dividing historic cost profits by the value of the capital assets employed also valued at historic cost. However, cumulating capital equipment of different vintages purchased at different price levels offends against basic principles because there is no fixed unit of measurement. The values which are summed are not commensurate with each other. (This objection applies equally, of course, to the calculation of profits at historic cost.) This might not matter if rates of return at historic cost bore a stable relationship to those at current cost. But the relationship will only tend to be stable when the rate of inflation remains constant. When inflation accelerates, the proportion of historic cost profits which is attributable to nominal holding gains will tend to rise sharply. This is certainly borne out by the U.K. data: the decline in profitability in U.K. industry in the middle and late 1970s was completely obscured by the historic cost profit data (see Section III.D.).

III. WHAT HAS HAPPENED TO PROFITS AND RATES OF RETURN

23. This part presents data showing how profit shares and rates of return have behaved across sectors in a number of countries. The first two sections discuss the analysis of data into trend and cycle and the most informative level of sectoral aggregation. The third section presents data derived from national accounts relating to operating profits and a fourth section presents more scattered data relating to profitability of firms. A final section discusses prospects for a recovery in profits and contains projections for the short run and medium term for both variables.

A. Trend and cycle: the longer run

24. Before inferring anything about the long-run behaviour and determinants of profits and rates of return it is necessary to eliminate purely cyclical effects. Both profits and rates of return can be expected to vary over the business cycle. Lower capacity utilisation reduces profits more than the wage

bill as numbers employed and/or real labour costs typically adjust with a lag; conversely, on the upswing profits tend to recover more rapidly than wages and other labour costs as real output increases more rapidly than numbers employed or hours worked, raising labour productivity. Later in the recovery, this effect is eroded as employment expands, particularly if wages increase faster than prices. This characteristic can be seen from the identity defining the labour share of national income:

$$\frac{W/L}{Y/L} = \frac{\text{hourly compensation}}{\text{product per labour hour}}$$

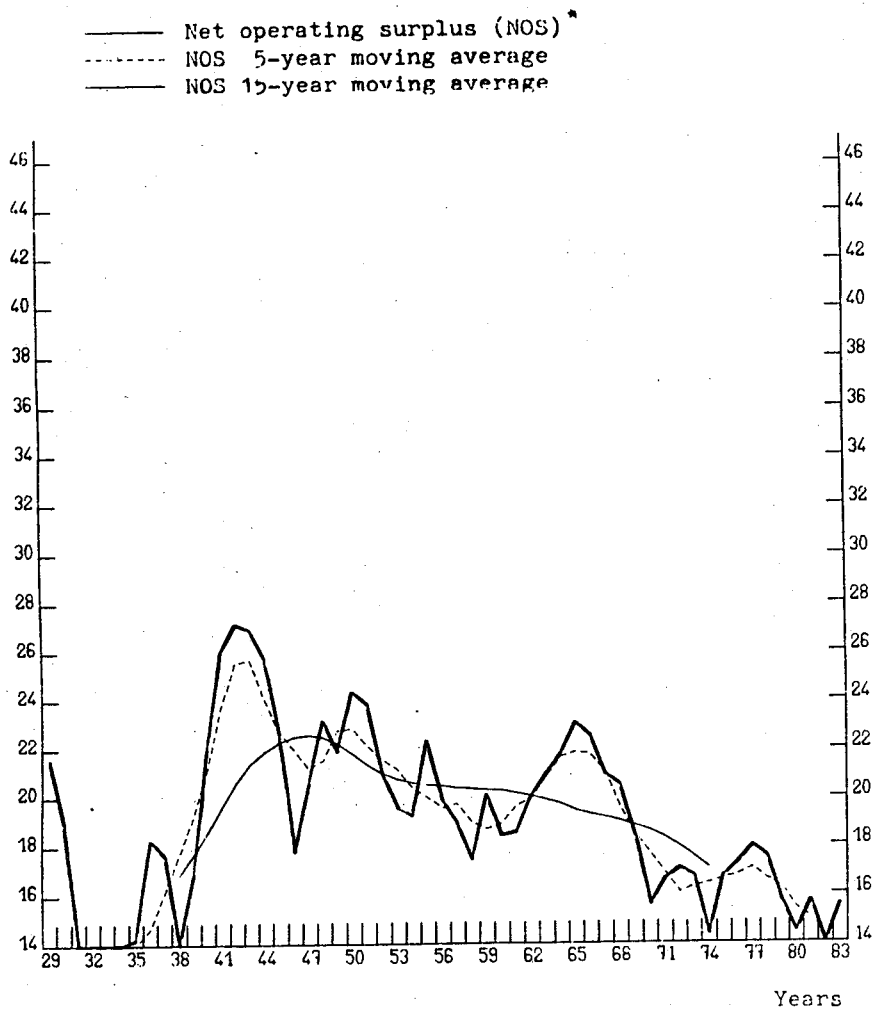
where W equals labour costs, L the number of labour hours and Y national income. The top part of the ratio is real hourly compensation and the bottom, hourly productivity. The labour share is equal to real hourly compensation divided by the productivity of labour. As a consequence, the profit share of value added will be affected to the extent that real labour costs lag or lead productivity changes in the cycle. This effect is reinforced to the extent that there are other fixed or semi-fixed elements in costs.

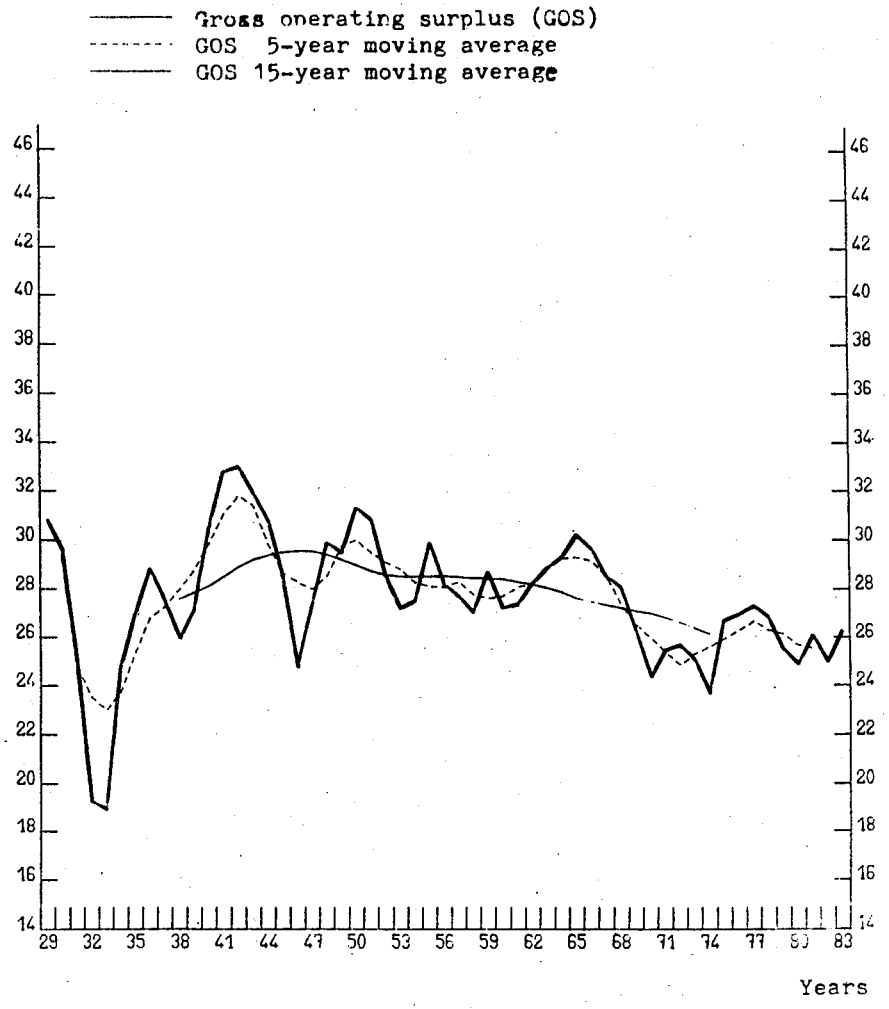
25. Other factors of course may lead to shifts in functional income distribution, as discussed further in Section IV. For example, if increased union power, indexation, or trade barriers render wage setting increasingly inflexible to market forces, this can lead to shifts in income distribution. Factors such as the speed and nature of technical change and the accumulation of capital will also affect underlying real output and productivity trends. Such institutional and technical factors should presumably be termed secular and an attempt to isolate them requires an extensive run of historical data, especially if cyclical swings are pronounced.

26. The problem with this classification is that there may be more than one cycle. Longer cyclical swings may last a decade or more. Hence, "cyclical" factors in some sense will be indistinguishable from the measured trend. For example, a question of concern is whether profit developments since 1973 represent a prolonged cyclical drop in profitability or a secular decline. To illuminate this issue and provide perspective for the body of this paper, data were obtained for four countries over as long a sample period as possible. Actual profit shares for these countries are graphed from the First World War or the 1920s in Chart A. Rates of return data cannot be provided due to the absence of useful capital stock data for prior to the Second World War. The data are smoothed first with a five-year moving average to remove short-run cycles and then further smoothed with a fifteen-year average to identify longer-term trends. In some cases, there is a distinct appearance of longer-run secular trends but results differ depending on which sector is examined. Indeed, overall trends are owing partly to sectoral or compositional shifts in output. The main impression of these data is that there is very limited support for the notion of long-run factor share stability as indicated by a doubly smoothed fifteen-year moving average. Some fifteen-year moving averages display persistent trends and swings of a very prolonged nature around this trend occur. For example, in Norway, the long-term decline in profit shares has been considerable but following a spectacular recovery in 1977, gross profit shares (in industry, transport and communications) in 1981 to 1982 were at about the same level as in 1946 to 1947, though well below the 1930s. Substantial sectoral shifts seem to be responsible with, in particular, the coming on-stream of North Sea oil largely accounting for the resurgence of profits since 1977. In Japan, net profit

Chart A

PROFIT SHARES: UNITED STATES
NON-FINANCIAL PRIVATE SECTOR
(per cent)





* From 1931 to 1934, the figures are 10.90, -1.73, -2.45, 9.63.

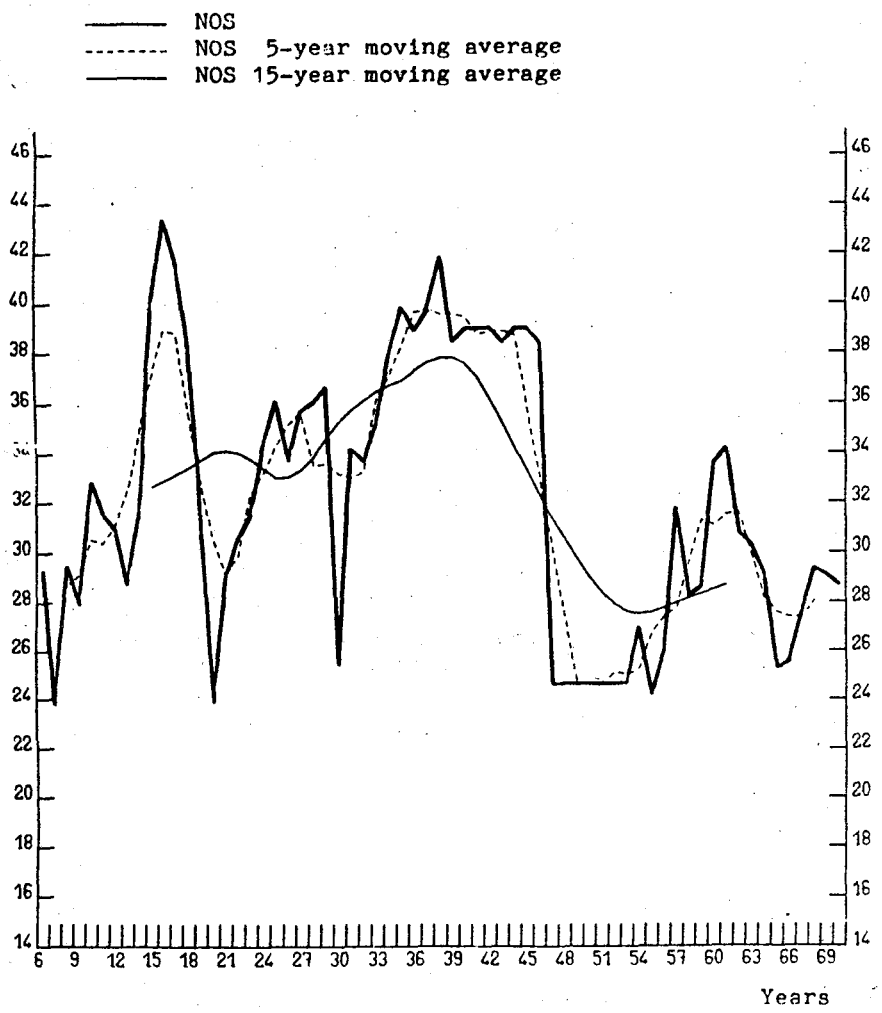
Chart A (cont'd)

NET PROFIT SHARES

INDUSTRY, TRANSPORT AND COMMUNICATIONS

(per cent)

JAPAN



NORWAY

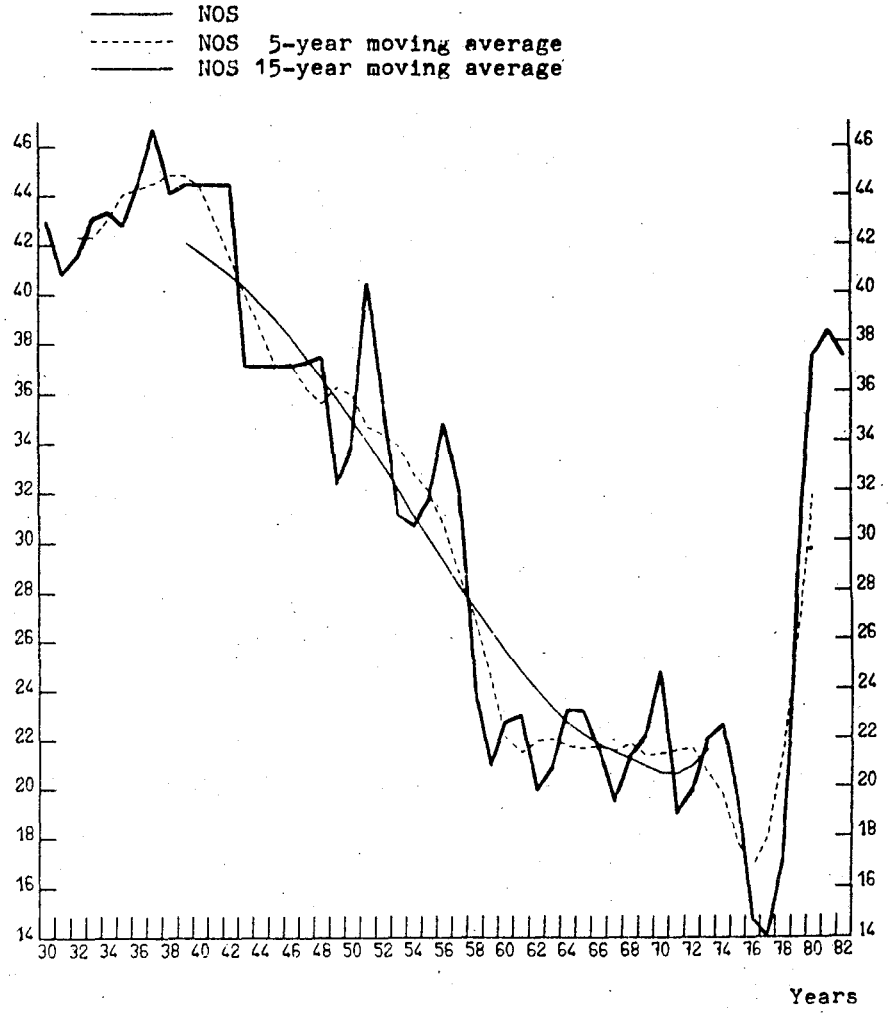
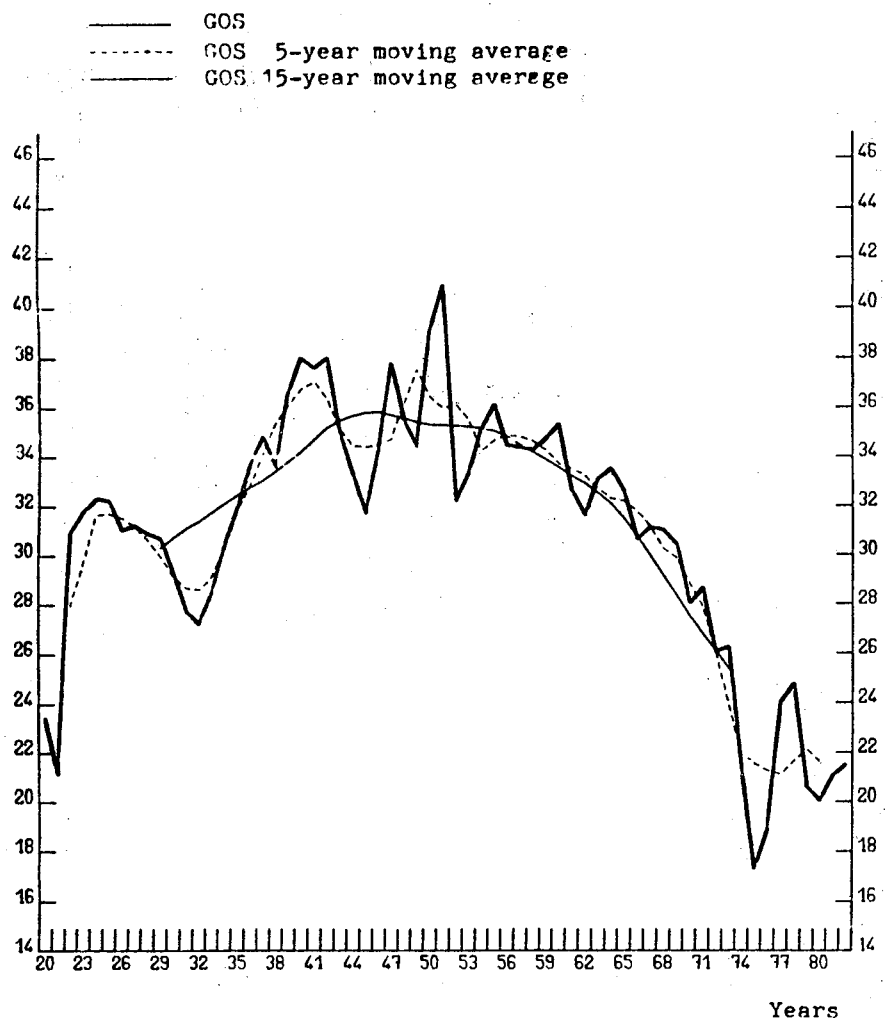


Chart A (cont'd)

UNITED KINGDOM

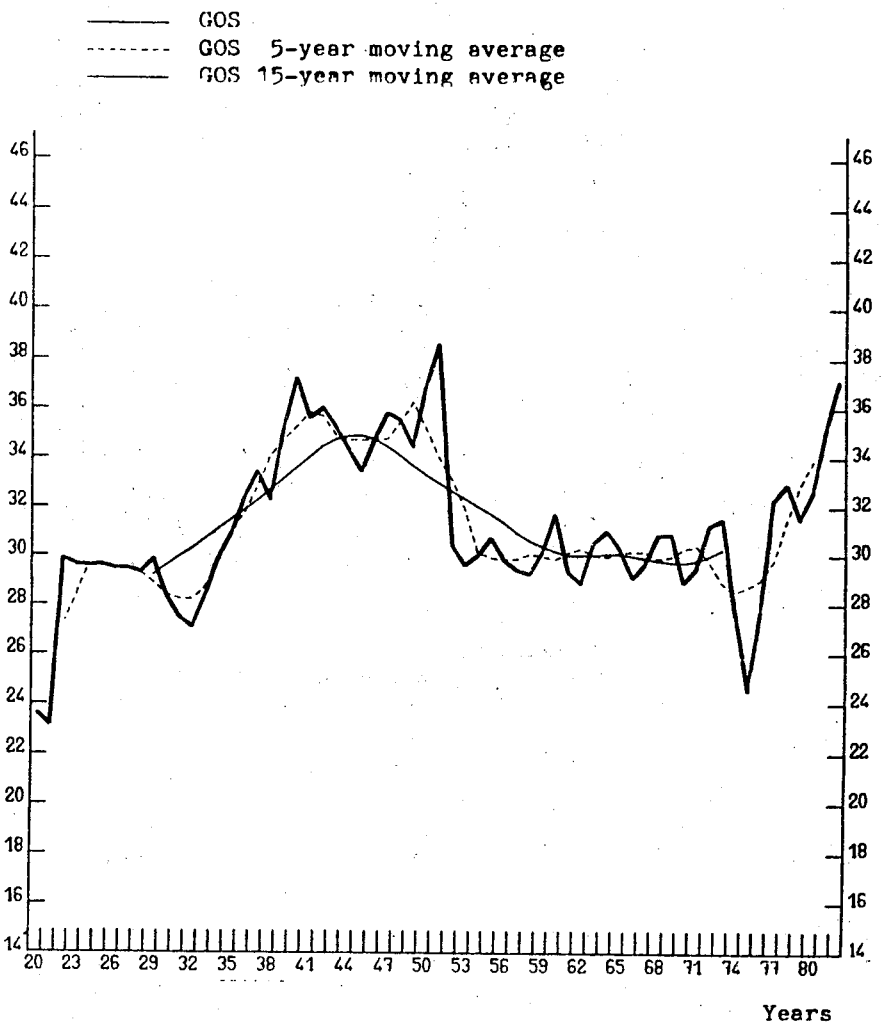
GROSS OPERATING SHARES IN MANUFACTURING

(per cent)



GROSS OPERATING SURPLUS IN INDUSTRY AND TRANSPORT

(per cent)



shares in industry and transport in the late 1960s were similar to those ruling in 1906 to 1909 but with wide swings in long-run trends in the interim. For the United Kingdom different sector coverage gives radically different impressions concerning trends in profit shares, particularly in the 1970s. For industry, transport and communications gross profit shares in 1982 were markedly higher than during the great depression, with fairly marked long-run swings and a pronounced recovery in the late 1970s related to the emergence of North Sea oil. By contrast, the manufacturing sector, with North Sea oil excluded, yields the opposite impression, particularly in the 1970s. Finally, a comparison of long-term trends for U.S. gross and net profit shares of non-financial corporations suggests by far the greatest degree of stability, apart from a sharp drop from 1932 to 1933 when net profit shares were actually negative. However, the long-run trend appears to indicate a gradual downward drift over time.

27. These data imply that clearly separating trend and cycle with the sort of sample period available for most countries is not possible. Data limitations mean that sample periods will at best begin in the mid-1950s and usually the 1960s. The focus must therefore be on five or ten-year "trends" which will be sensitive to differing amplitudes of short cycles within the sample period and which may in fact be parts of longer cycles themselves. From a longer perspective the 1960s were a particularly favourable environment for growth and productivity gains. It is probably a mistake therefore to regard any current "trends" as departures from some "normal" level of profitability. Changes in profit shares, often quite sustained, appear to be the true norm. That is not to say they are always desirable or to be regarded with fatalism.

B. Compositional problems

i) Choice of sectors

28. As the previous section suggests the level of sectoral aggregation of profit data can greatly influence observed tendencies. In this report rates of return are shown for three sectors of the economy -- i) industry, transport and trade, ii) industry and transport, and iii) manufacturing. Several considerations entered into the choice of these sectors. First, it would not be meaningful to calculate rates of return for agriculture and banking since their profits are mainly a return to, respectively, land and financial assets, both of which are excluded from the stock of fixed reproducible assets which constitutes the denominator in the rate of return. Secondly, rates of return for governments are not included because although their capital stock is large, it consists mainly of infrastructure on which they earn no operating surplus. However, the corresponding operating surplus may be included in the return to other sectors or even factors. For instance, the operating surplus on roads accrues to the transport and other sectors while that on education is part of the return on human capital. No attempt has been made to estimate this effect because of the difficulty of valuing and apportioning the surplus and because of inter-country differences in the boundary between public and private sectors. Thirdly, it also seems best to omit the real estate sector because dwellings are generally regarded as in some sense less "productive" than other kinds of fixed assets. Omission of agriculture, banking, government and real estate defines the first of the sectors mentioned above -- industry, transport and trade or the total business sector.

"Industry" here covers mining and quarrying, manufacturing, electricity, gas and water supply and construction; "transport" includes also storage and communications; and "trade" covers retail and wholesale trade, hotels and restaurants.

29. While there must obviously be considerable interest in this sector because of its broad coverage, there are at least two problems in interpreting its measured rates of return. A large part of the operating surplus earned in retail and wholesale trade is presumably a return to investment in stocks which, however, are excluded from the denominator of the rate of return. In general, this means that measured rates of return are overstated. However, there will be no systematic bias in trend unless stock/output ratios have changed over time due to improved inventory management techniques (see Annex I). Another potentially important omission is financial working capital (2). There is the additional problem that operating surplus for retail trade, hotels and restaurants includes, in most countries, a large element of income from self-employment -- a problem that is discussed in the next section. Omission of "trade" leaves the second sector mentioned above, industry and transport. Finally, rates of return are shown for manufacturing, not only because of its inherent interest as a tradeable goods sector, but also because in most countries the operating surplus of this sector contains an insignificant amount of income from self-employment, so that recorded rates of return for manufacturing are "purer" than for the other sectors shown.

ii) Income from self-employment

30. In the national accounts the value added of the various industry groups is broken down only into compensation of employees and operating surplus, with the latter including all income from self-employment. However, it can be argued that income of self-employed persons represents a return to the labour service that they provide as well as a return to the capital they have invested, and in some studies of the present kind attempts are made to divide self-employment income between compensation of employees and operating surplus. The problem is that there are two ways in which this can be done -- by imputing a wage to the labour services of the self-employed or by imputing an operating surplus to their invested capital. Both are equally plausible, but if both imputations are made simultaneously they will rarely sum to the total income of the self-employed. Usually they sum to more than that total, which implies that self-employed persons are prepared to accept less than the market rate for their labour, or for their invested capital, or for both. In practice, most attempts to divide self-employment income into its two hypothetical components are based on a wage imputation because data on the numbers of self-employed are more readily available than information on the capital invested in unincorporated enterprise. But this is merely a matter of convenience and it is just as plausible to argue that the self-employed earn a below-average wage as it is to argue that they receive a below-average return on their investment.

31. If the purpose is to study labour income or returns to capital in isolation from each other, it may be defensible to divide up self-employment income using one or the other of these mutually inconsistent assumptions. However, in the present study interest focuses precisely on the shares of value added appropriated by capital and labour, and the statistics used to examine this question should not contain any prior assumptions with respect to those factor shares. Consequently, no adjustment is made in this study, and

operating surplus in the rates of return shown below includes all self-employed income.

32. One way of avoiding this problem would be to confine the analysis to the corporate sector, but unfortunately only four OECD countries compile capital stock statistics for this sector. As noted above, the manufacturing sector usually includes relatively few self-employed persons, but the other two sectors may include substantial numbers of self-employed in some countries. The inclusion of income from self-employment will tend to overstate rates of return because the operating surplus includes some labour income. This will affect both inter-country comparability if self-employment is more common in some countries than in others, and inter-temporal comparisons if the proportion of self-employed persons in the labour force changes from one period to another.

33. Table 2 provides some indication of the size and direction of the possible distortions. It shows the self-employed as a percentage of the non-agricultural civilian labour force in the fourteen OECD countries covered in this study over the period 1955 to 1982.

34. There is obviously considerable variation between countries with regard to the importance of self-employment, and it seems clear that for the two broader sectors -- industry, transport and trade, and industry and transport -- the levels of rates of return and profit shares cannot legitimately be compared across all fourteen countries. However, inspection of Table 2 suggests that the fourteen countries can be divided into three relatively homogeneous groups -- a high self-employment group, Japan and Italy (20-30 per cent non-agricultural employment), a low self-employment group, Canada, the United States, Finland, Norway, Sweden and the United Kingdom (under 10 per cent), and a middle group consisting of Australia, Belgium, Denmark, France, Germany and the Netherlands (between 10 and 20 per cent). For countries within these groups, profit levels may be reasonably comparable.

35. As regards changes over time, Table 2 shows that with the exceptions of Australia and the United Kingdom, self-employment shares have generally been falling throughout the period. The effect of this is to exaggerate the decline (or understate the increase) in operating surplus as measured in the national accounts because income that was formerly included in operating surplus will now be counted as wages and salaries. However, the table shows that most of the decline occurred in the period up to 1969. From 1970 onwards, changes in self-employment percentages were generally quite small, and could hardly have had any measurable effect on changes in rates of return or profit shares.

C. Rates of return, profit shares and capital productivity

36. This section examines gross rates of return and then gross profit shares for a selection of OECD countries over the period 1960 to 1982. A later section shows the effect of removing interest payments and tax payments. The gross rate of return is defined as the ratio of the gross operating surplus (P) to the gross stock of fixed reproducible assets (K). In analysing changes in this rate it is helpful to decompose it into the share of gross operating surplus in gross value added (Y), and the ratio of gross value added to the capital stock, i.e. $P/K = P/Y.Y/K$. To simplify the terminology,

Table 2

SELF-EMPLOYED PERSONS AS A PERCENTAGE OF NON-AGRICULTURAL CIVILIAN EMPLOYMENT

	1955-59	1960-64	1965-69	1970-74	1975-79	1980-82
United States	..	11	9	7	7	8
Japan	31	26	23	22	21	21
Germany	13	12	11	10	9	9
France	18	16	14	12	11	11
United Kingdom	6	6	6	7	7	8
Italy	..	25	25	23	23	23
Canada	9	9	8	7	7	7
Australia	..	..	11	10	12	13
Belgium	18	17	16	15	14	14
Denmark	..	..	14	13	11	11
Finland	..	..	8	6	5	5
Netherlands	16	14	13	11	9	9
Norway	11	10	9	9	8	8
Sweden	..	..	8	5	5	5

Source: Labour Force Statistics, OECD, various years.

P/K will be referred to as the rate of return, P/Y as the profit share, and Y/K as capital productivity.

37. Tables 3 and 4 and Chart B show as many of these ratios as are available for industry, transport and trade (total business sector), industry and transport, and manufacturing. Absolute values of gross rates of return (Table 3) and gross profit shares (Table 4) are shown for 1960 and the latest dates available. The mid-point, 1973, corresponds to a cyclical peak before the first oil shock; the last date available typically represents a cyclical trough. A principal purpose of this section is to see whether there has been a statistically significant secular decline in rates of return and profit shares. Fitted time trends were found to be statistically significant, virtually without exception and regardless of sample periods, over the 1960s to the 1980s.

i) Rates of return

38. Table 3 and Chart B show a widespread trend decline in profit rates for the period as a whole. However, the general negative trend conceals a good deal of variation over the sample period. In the manufacturing sector, the decline set in only after 1973 in Japan, France, Belgium and Norway, while in Finland gross rates of return remained broadly constant (but data are available for only the 1970s); in Italy they picked up in 1980.

39. Trend declines were less marked at higher levels of aggregation, with, in industry and transport, only Germany and Canada declining throughout. Falling rates of return set in only after 1973 in France and Belgium. In the total business sector the rate of decline on average was just over half that in manufacturing, though there was a smoother pattern throughout the period in most countries for which data are available. The most marked decline was in Germany, where rates of return fell 10 percentage points between 1960 and 1982. Falling profit rates became apparent in France and Canada only after 1973.

40. There are apparently large differences in rates of return among countries. In manufacturing, for example, the highest rate of return is between three and four times higher than the lowest. For the broadest sector, industry, transport and trade, the spread is smaller but the highest rates are still two or three times higher than the lowest rates. These differences may, in part, be due to the inclusion of self-employment income in operating surplus, which (as noted in Part III.B.ii), will tend to overstate rates of return. In general, countries with high rates of return tend to fall in the "high" and "medium self-employment" categories identified earlier, while those with low rates of return are those with low proportions of self-employed. Nonetheless these differences are quite large and do not appear to have been eroded with time. Shifts in self-employment also affect sectoral patterns. The movement out of self-employment had been faster in the broader sectors in the 1950s and 1960s. However, as noted in III.B.ii above, this movement stopped in the early 1970s. This makes the faster fall in rates of return in manufacturing in the 1970s even more striking.

41. Differences in depreciation rates also appear to be associated with inter-country variance in the rates of return. It appears that countries with above-average depreciation rates tend to have above-average rates of gross return. Depreciation rates are inversely related to the average service lives

Table 3

GROSS RATES OF RETURN IN SELECTED OECD COUNTRIES

	Total Business Sector				Industry and Transport				Manufacturing			
	1960	1973	1982	Trend	1960	1973	1982	Trend	1960	1973	1982	Trend
United States	16.2	14.5	10.9	-2.1*	-	-	-	-	18.9	18.5	10.6	-2.7*
Japan (1965-81)	-	-	-	-	-	-	-	-	33.3	32.4	20.7	-4.9*
Germany (1960-81)	24.3	17.2	14.5	-2.0*	20.4	14.2	11.0	-2.3*	26.2	16.5	11.7	-3.0*
France (1967-79)	21.7	22.9	19.3	-1.9*	14.4	15.6	12.7	-2.4*	15.6	18.2	13.8	-2.7*
United Kingdom	13.3	11.0	10.1	-1.9*	10.1	8.7	8.8	-1.1*	16.4	9.5	5.5	-5.3*
Italy (1970-80)	-	-	-	-	-	-	-	-	17.7	16.9	19.2	0.1
Canada	13.3	13.6	9.7	-0.8*	10.3	10.8	7.5	-0.8*	15.3	15.3	6.7	-2.0*
Belgium (1970-81)	28.4	27.5	22.9	-1.4*	17.0	17.0	14.6	-1.1*	17.1	17.2	10.7	-4.7*
Finland (1971-79)	10.3 (a)	8.5	7.6	-4.3*	9.6	10.1	9.4	-2.9	13.4	14.3	14.1	-2.8
Norway (1962-77)	-	-	-	-	-	-	-	-	7.7	10.2	7.1	0.8
Sweden (1963-82)	11.8	10.4	8.3	-2.8*	9.9	9.4	7.2	-2.6*	11.8	9.1	5.9	-5.2*

Source: OECD National Accounts and capital stock files.

Notes: 1. The total business sector is defined to exclude the government, financial and farm sectors. It is items 2, 3, 4, 5, 6, 7 and 9 of Table 2, OECD National Accounts. Industry and Transport is items 2, 3, 4, 5 and 7. Manufacturing is item 3 only.

2. The trends have been fitted by taking the logarithm of gross operating surplus over the gross capital stock in each sector as a function of time: log GOS/GCS = a + bt. The trend column shows the b coefficient in percentage terms. One asterisk indicates significance at the 5 per cent level. GOS and GCS are measured at current prices.

3. When data were not available for the whole period the actual dates are shown in the table.

4. Dashes are entered where data were not available for a particular sector.

a. 1970.

Table 4

GROSS PROFIT SHARES IN SELECTED OECD COUNTRIES

	Total Business Sector				Industry and Transport				Manufacturing			
	1960	1973	1982	Trend	1960	1973	1982	Trend	1960	1973	1982	Trend
United States	30.8	28.1	27.6	-0.6*	30.3	28.8	30.0	-0.2	25.2	24.7	21.2	-0.8*
Japan	54.0 (a)	47.9	38.6	-2.6*	53.1	47.4	42.3	-1.3*	57.6	51.5	42.3	-1.9*
Germany (1960-81)	45.2	38.3	38.0	-0.7*	40.8	32.7	29.8	-1.3*	39.1	31.2	25.6	-1.7*
France (1967-79)	44.3	42.7	39.9	-1.2*	35.8	35.1	32.9	-1.3*	33.5	34.3	30.1	-1.6*
United Kingdom	32.3	31.9	34.7	0.1	31.7	31.5	37.1	0.4	35.3	26.3	21.5	-2.8*
Italy (1970-82)	51.7	49.1	48.3	-0.6	36.7	34.1	38.2	0.8	34.1	32.9	35.3	-1.0
Canada	37.1	37.1	36.0	-0.1	36.3	37.9	37.7	0.2	33.4	32.3	24.7	-0.6*
Belgium (1970-81)	49.7	46.3	41.4	-1.5*	38.4	35.4	32.2	-1.5*	36.3	33.2	20.8	-5.5*
Finland	41.4	33.8	32.5	-1.0*	40.3	36.3	37.5	-0.2	42.4	37.1	34.3	-0.6*
Norway	39.0 (b)	35.5	47.1	0.3	36.5	36.6	50.5	1.1*	30.1	31.1	25.5	-0.2
Sweden	31.7 (c)	30.7	30.4	-1.0*	36.0	32.5	32.6	-0.8*	33.9	25.5	23.7	-2.4*

Source: OECD National Accounts files.

Notes: 1. As in Table 3.

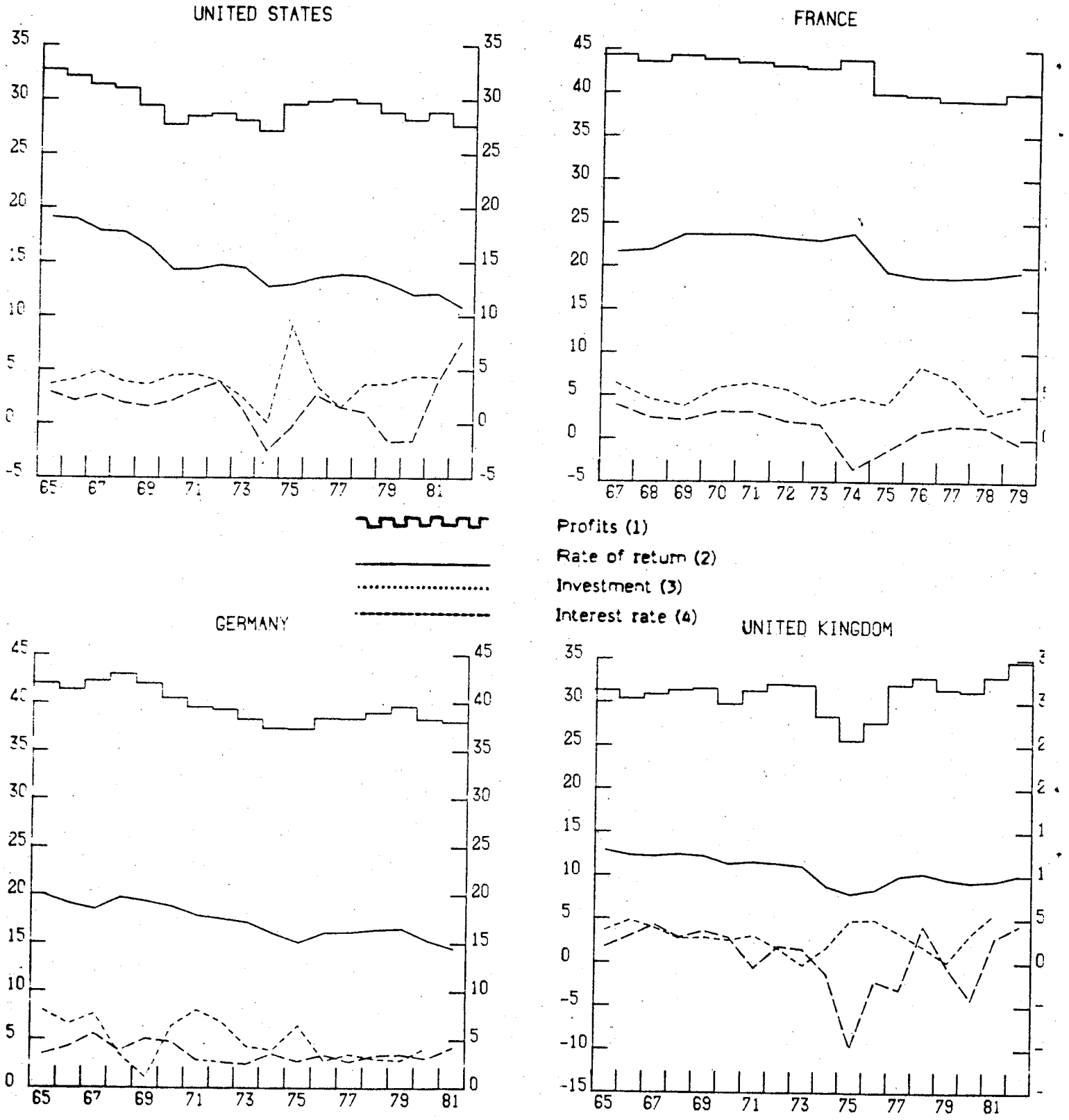
2. The trends have been fitted by taking the logarithm of gross operating surplus over gross value added in each sector as a function of time: log GOS/GVA = a + bt. The trend column shows the b coefficient in percentage terms. One asterisk indicates significance at the 5 per cent level. GOS and GVA are measured at current prices.

3. When data were not available for the whole period the actual dates are shown in the table.

a. 1970. b. 1962. c. 1963.

Chart B

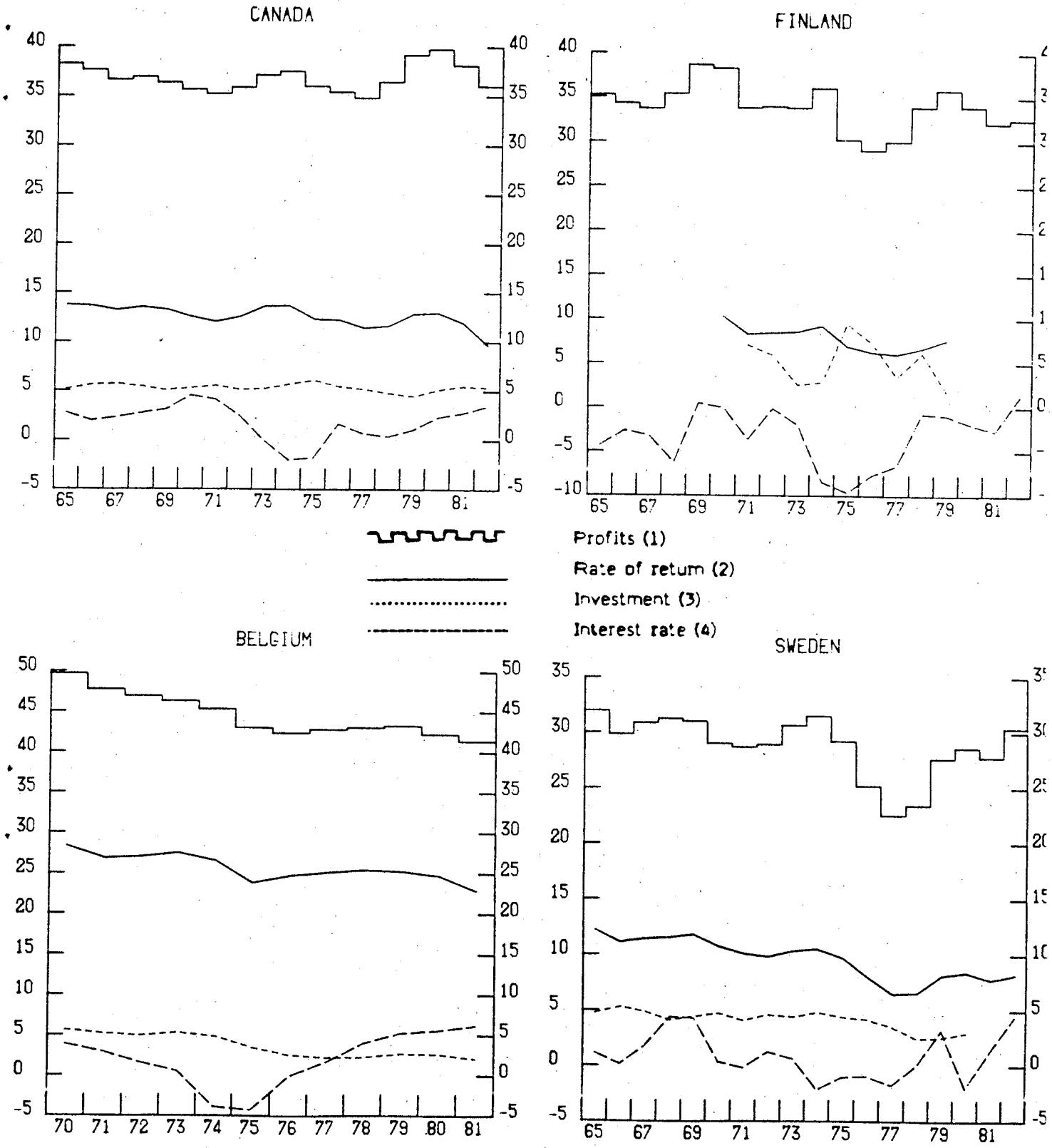
PROFITS, RATE OF RETURN AND INVESTMENT
IN TOTAL BUSINESS SECTOR



1. Gross operating surplus as a percentage of gross value added.
2. Gross operating surplus as a percentage of gross capital stock.
3. Growth of real gross capital stock.
4. Long-term government bond yields less the rise in consumer prices.

Chart B continued

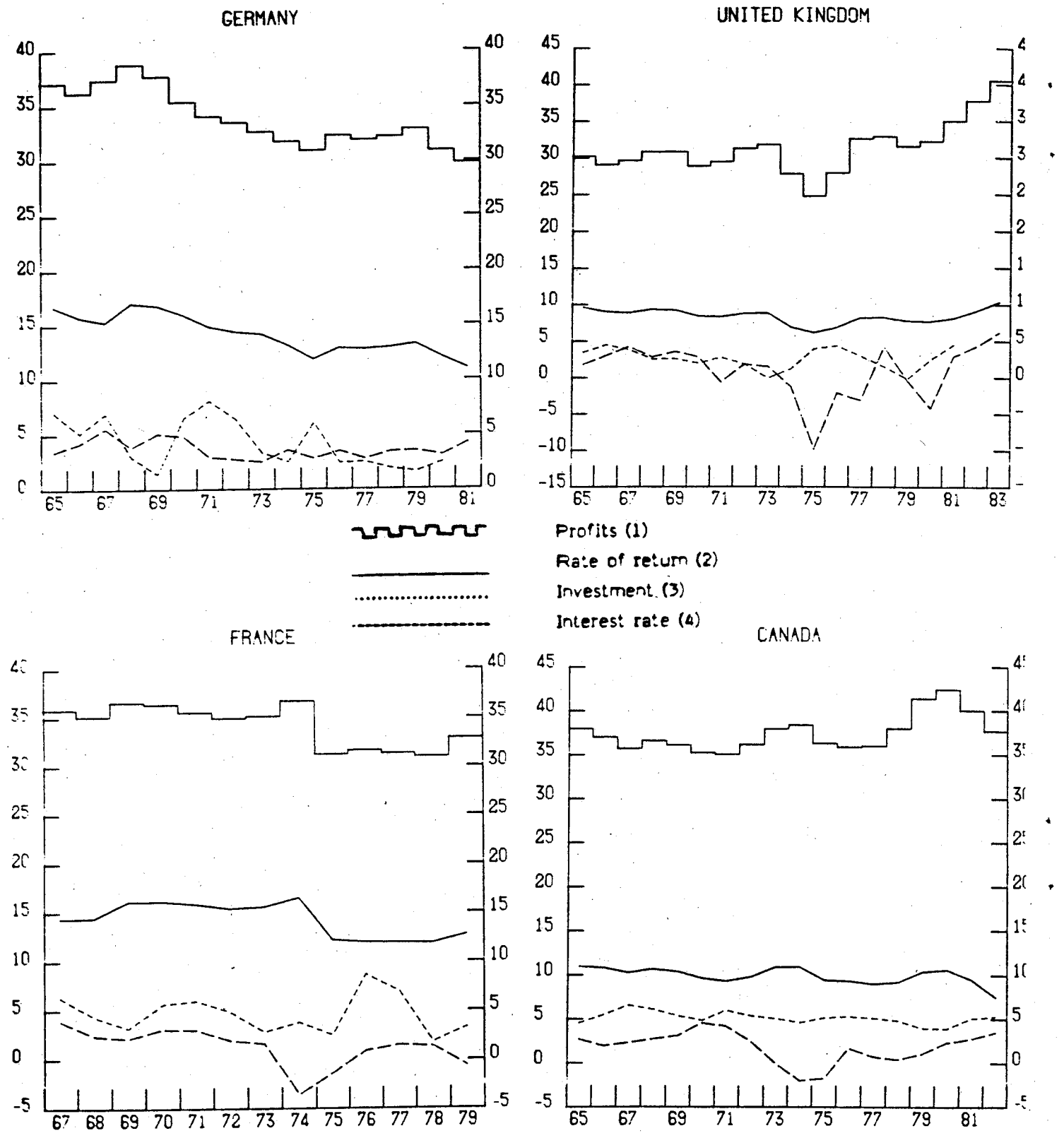
PROFITS, RATE OF RETURN AND INVESTMENT
IN TOTAL BUSINESS SECTOR



For notes see first page of this chart.

Chart B continued

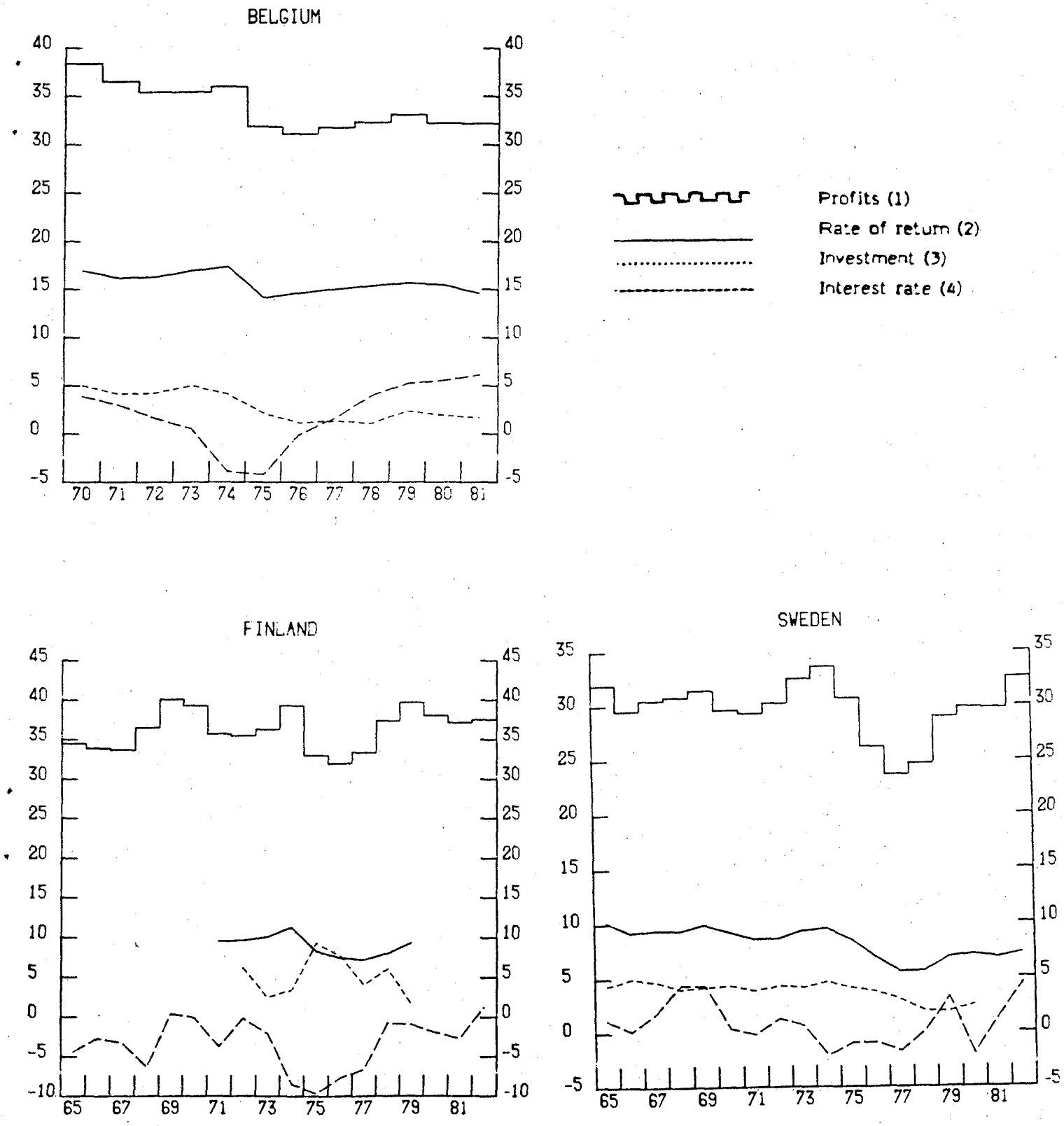
PROFITS, RATE OF RETURN AND INVESTMENT IN INDUSTRY AND TRANSPORT



For notes see first page of this chart.

Chart B continued

PROFITS, RATE OF RETURN AND INVESTMENT
IN INDUSTRY AND TRANSPORT



For notes see first page of this chart.

Chart B continued

PROFITS, RATE OF RETURN AND INVESTMENT IN MANUFACTURING

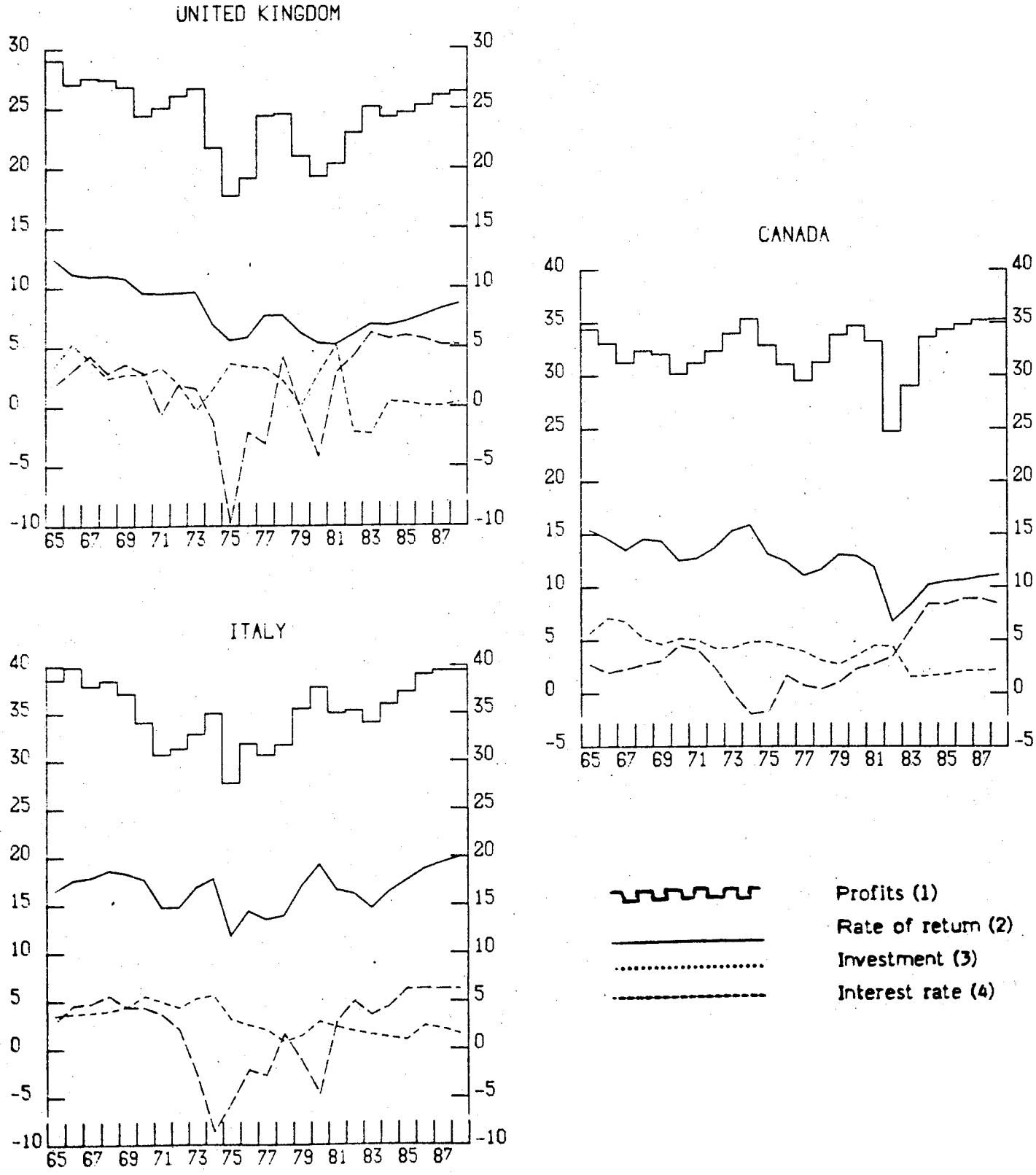


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Chart B continued

PROFITS, RATE OF RETURN AND INVESTMENT IN MANUFACTURING

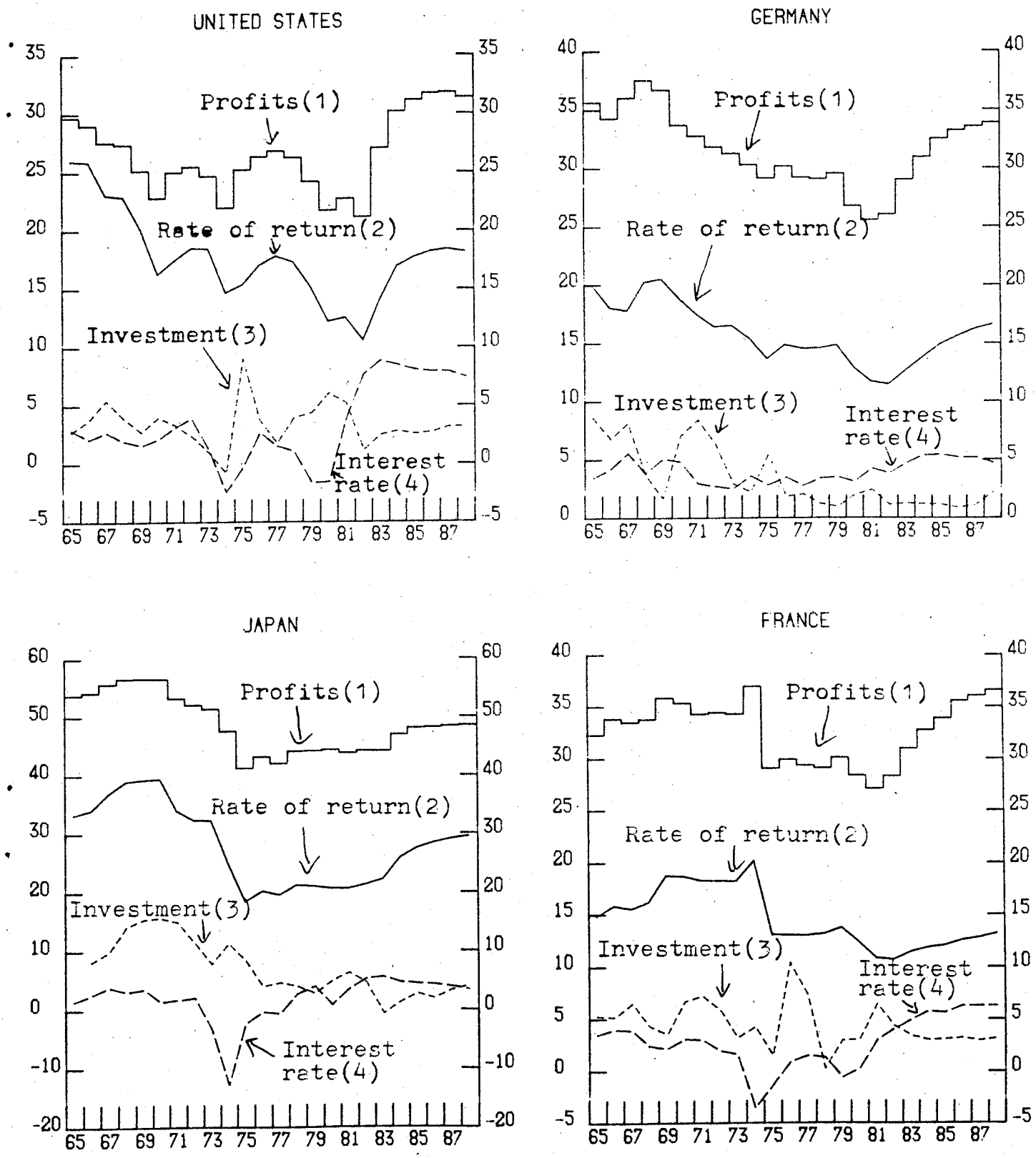

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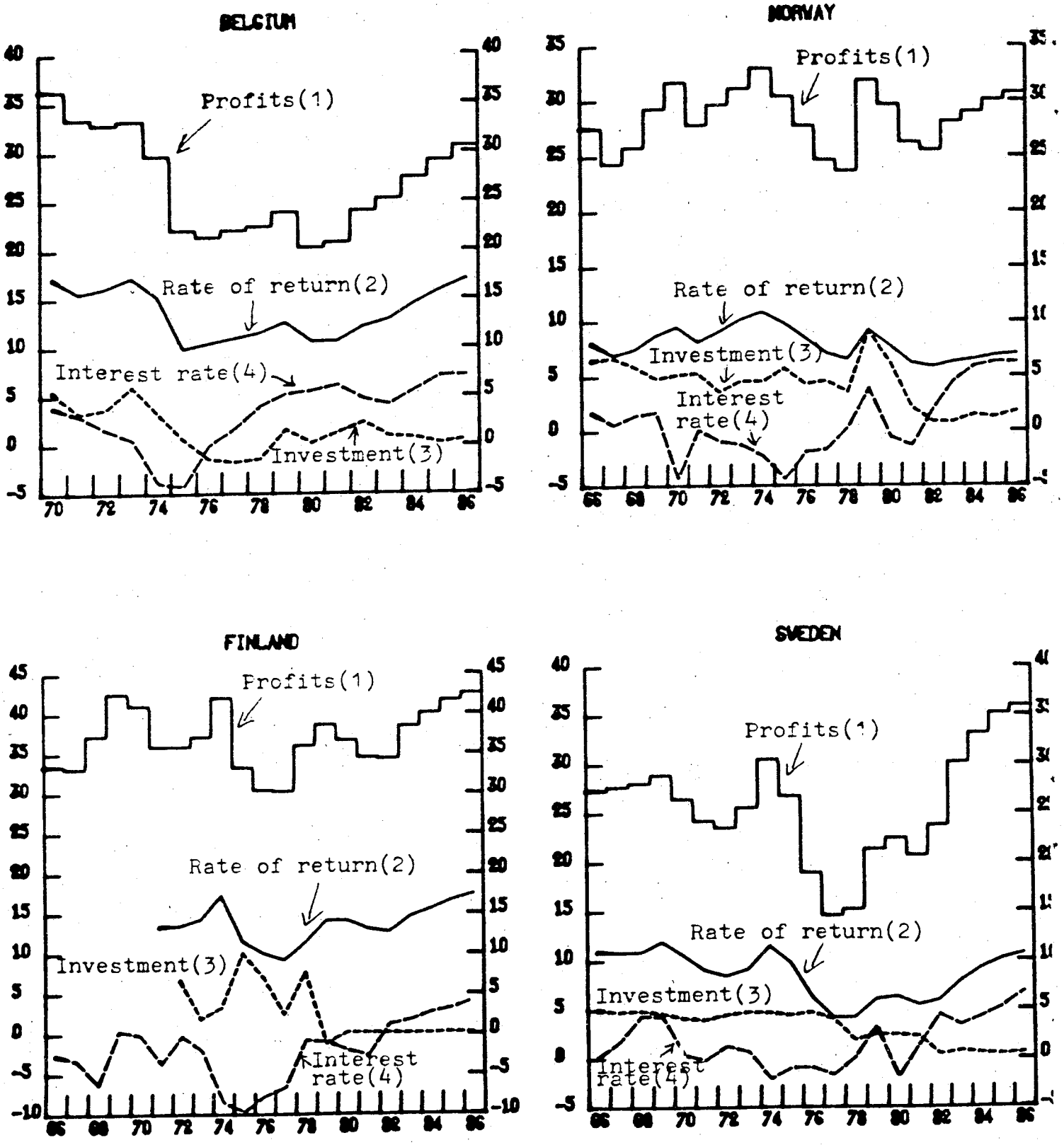
Chart B continued

PROFITS, RATE OF RETURN AND INVESTMENT IN MANUFACTURING



For notes see first page of this chart.

of capital assets -- the shorter the life, the higher the rate of depreciation. In general, countries with low rates of return -- Sweden, Finland and the United Kingdom -- are those where fixed assets have (or are assumed to have) relatively long service lives, while in Japan, France and Belgium where rates of return are high, asset service lives are relatively short. It is difficult to say what economic factors this observed association reflects.

42. Despite somewhat mixed sector and country trends, a finding based on regression analysis is that simple time trends are negative and statistically significant in almost all cases. The decline after 1973 was general and particularly marked in manufacturing. Factors which may account for the more pronounced fall in manufacturing profit rates are explored in Section IV. These results contrast with the view that the trend decline in factor shares and rates of return is largely a European and Japanese phenomenon, as implied by earlier empirical work (3). An attempt is made below to explore the contribution to this trend decline in profitability of other variables such as degrees of capacity utilisation, heightened international competition, and the rate of inflation.

ii) Profit shares

43. Declining rates of return reflect to some extent the concomitant fall in profit shares (Table 4), which was, however, generally only half as sharp as that in rates of return. In the total business sector the decline was most evident in France, Belgium and Finland, and somewhat less so in the United States, Germany and Sweden. No significant trend is present for the United Kingdom and Canada, in either this sector or in industry and transport. This probably reflects the importance of energy sectors in these countries. Again, declines are more marked in the manufacturing sector, with the United Kingdom, Sweden and Belgium showing the most rapid falls. Only in Norway is a significant trend absent for the profit share in manufacturing.

44. Profit shares are affected by self-employment income in the same way as rates of return. Countries with high self-employment shares will tend to have high profit shares, and the decline in the relative importance of self-employment will also exaggerate the decline in profit shares.

iii) Capital productivity

45. As movements in profit shares can explain only a part of the decline in rates of return, the behaviour of capital productivity must account for the remaining fall. Since 1973, capital productivity -- as measured by the ratio of gross value added to gross capital stock -- has fallen in the total business sector in all countries for which data are available, the United Kingdom apart. Before that date, the picture was more mixed, with increases recorded in the United States, Canada and France. In Germany, capital productivity has declined almost continuously throughout the period. These trends no doubt reflect the continuing growth of capital/labour ratios despite a marked slowing in output growth after the first oil shock. (See Table 22, showing compound growth rates for employment, capital stock and total factor input for the periods 1960 to 1972 and 1972 to 1982, and 23 for growth rates of labour, capital, and total factor productivity over the same periods, in Part IV.B(iv) where the significance of these developments is discussed.)

46. Trends in industry and transport are broadly similar to those in the total business sector, while the deceleration in rates of growth or actual fall in capital productivity is much sharper after 1973 in the manufacturing sector than in sectors at a higher level of aggregation. The contrast between periods is also more marked, with a larger number of countries showing gains in capital productivity between 1960 and 1972, yielding to declines thereafter. The reversal in the United Kingdom is particularly marked: from a 4.8 per cent positive growth rate to a decline of 2.6 per cent in the later period.

47. The continuing very large differences in the level of capital productivity between countries remain somewhat puzzling. In manufacturing, capital productivity ratios in Japan, Germany and the United States were nearly twice as high as those for Norway, Sweden and the United Kingdom. As noted in Annex I, a number of critical parameters underlying the estimates of capital stocks have a weak empirical base. While some part of the inter-country differences in capital productivity must reflect real differences, it is hard to avoid the conclusion that an important part arises from inter-country differences in capital-stock estimates, stemming from radically different, and necessarily hazardous, assumptions about service lives and scrapping. For example, it is puzzling to find large persistent differences in capital productivity between Canada and the United States, since capital has moved fairly freely between these two countries for decades. This difference is entirely accounted for by differences in service life assumptions. If Canadian rates of return are calculated using U.S. service life assumptions, rates in Canada are indeed higher than comparable U.S. rates rather than the reverse. Given these difficulties, trends in rates of return are less likely to be open to misinterpretation than levels.

48. The data presented in Tables 3 and 4 are subject to cyclical as well as trend influences. To illustrate shifts in underlying trends, a nine-year moving average (to represent average utilisation rates) was fitted. As might be expected, the results show that 1982 profit rates were well below trend. However, as can be seen from Chart B, there was a clear downward trend in profit shares and rates of return even before 1973 in most countries. Furthermore, this phenomenon was not confined to Europe and Japan. Cyclical and country-specific factors thus appear to account for only a part of the depressed profits picture seen in past years. Any useful explanation needs to embrace the general and longer-term nature of the phenomenon, while acknowledging that there were also special factors in the 1970s.

49. Overall, it appears that downward movements in capital productivity are the most important factor underlying falling rates of return; though declining profit shares also contribute to this outcome. This is clear from simple inspection of the data, a comparison of growth rates and fitted time trends. The conclusion appears robust, given the evidence of statistically significant time trends in almost all countries and sectors for which data are available. Testable hypotheses related to possible factors underlying these common trends are discussed in Section IV. Regression results (where cyclical, competitive and inflation effects are taken into account) are reported in Annex II.

D. Pressures on firms and an alternative measure of profitability

i) Net interest payments and post-tax profits

a) Net interest payments

50. The figures cited above probably give the best available indication of the behaviour of profit shares and rates of return, in that they use clear and consistent definitions of both variables over time and across countries, and provide a reasonably accurate measure of the ex post average return on productive assets. However, these definitions may be poor indicators of the profits that are the motivators of economic activity. They cannot indicate ex ante returns at the margin and they ignore some influences crucial to firms. In particular, with the marked rise of nominal interest payments and the limited choices available at any one time for changing the firm's structure of finance (though this varies from country to country) it can be argued that the 1970s represented a more stringent time for companies than is represented by the gross profit figures in National Accounts. For this reason, an attempt has been made to present trends in operating surplus adjusted for net interest payments (Table 5). These figures are available only for non-financial corporate and quasi-corporate enterprises as a whole, and not for the three sectors discussed earlier, so that only broad comparisons can be made. Comparable measures of profit share and rates of return in the overall non-financial sector cannot be obtained. Furthermore, this is only a partial adjustment as it does not take into account the balance sheet improvement obtained by companies from the revaluation of their debt; it should perhaps therefore be regarded as indicating pressure on cash flow rather than on overall profitability. A more thoroughgoing review, but for fewer countries, is presented below in the section on returns to equity.

b) Post-tax profits

51. It is clear that profits after tax are key for firms but data are hard to obtain. Difficulties of taking into account the full complexity of the tax structure, the accrual nature of tax payments and offsets, and the occurrence of large tax changes affecting capital and income from capital make inferences drawn from a simple "netting" of ex post profits for ex post tax very hazardous. However, it may be that something can be gleaned from comparing movements in the tax receipts and profit series. It is not possible to isolate other taxes, so what is shown below is only direct corporate tax revenue in the National Accounts.

52. Table 6 shows that corporate tax as a proportion of total tax receipts has fallen steadily in most countries since 1955, with few exceptions. This is also the trend shown in direct tax as a proportion of net operating surplus in the non-financial corporate sector (Table 7), although here the exceptions are more striking. However, in the majority of countries, corporate tax burdens appear to have declined since 1955. Furthermore, the raw data suggest a slight tendency for tax payments to move contra-cyclically, despite the accrual nature of tax liabilities (4). The decline in pre-tax profit shares and rates of return referred to above has if anything been cushioned by the tax system, and this tendency continues (5). Tax relief appears to have followed a perception that profit shares had been eroded. However, it is not clear whether the continuing decline in profit shares and rates of return was independent of the tax relief as it may have permitted the adoption of less

Table 5

COMPOUND ANNUAL GROWTH RATES OF GROSS AND NET OPERATING SURPLUS BEFORE AND AFTER NET INTEREST PAYMENTS

1970-1982, nominal values

	Gross operating surplus	Net operating surplus	Net interest payments	Gross operating surplus after deduction of net interest payments	Net operating surplus after deduction of net interest payments
United States	10.9	9.8	14.6	10.2	7.8
Japan	8.5	7.6	12.5	7.1	4.1
Germany	6.9	5.8	11.7	6.0	3.9
France	11.5	8.4	16.7	9.9	-0.2
Italy	18.1	14.5	25.9	14.1	(a)
Austria	11.1	10.7	19.6	9.2	7.6
Finland	14.1	15.0	21.4	11.8	9.3
Switzerland	11.9	9.7	14.8	10.8	1.3

Source: OECD National Accounts files and Secretariat calculations.

a. Compound growth rate cannot be calculated because final figure(s) negative.

Table 6

CORPORATION TAX RECEIPTS AS PERCENTAGE OF TOTAL TAX RECEIPTS

	1955	1960	1965	1970	1975	1980
United States	20.3	17.2	15.8	12.7	10.8	10.1
Japan	14.5	22.1	17.3	20.1	16.0	16.9
Germany	9.8	9.4	7.8	5.7	4.4	5.5
United Kingdom	17.0	9.7	7.0	9.2	6.2	8.5
Italy	5.5	6.9	6.9	6.6	6.3	8.4 (a)
Canada	17.6	17.5	15.1	11.3	13.7	10.7
Austria	6.0	6.0	5.4	4.4	4.4	3.4
Belgium	4.4	4.3	6.2	6.8	7.4	5.7
Denmark	5.9	4.6	4.5	2.6	3.1	3.2
Finland	11.1	9.0	8.3	5.5	4.2	4.3
Ireland	7.4	6.5	9.1	8.8	4.8	4.6
Netherlands	13.4	10.7	8.0	6.7	7.7	6.7
Norway	13.3	4.9	3.8	3.3	2.9	13.3
Portugal	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Sweden	13.8	8.8	6.1	4.4	4.3	2.4
Switzerland	6.4	7.1	7.1	7.6	7.7	5.9
Australia	15.9	16.8	16.1	16.7	12.3	10.3 (a)
New Zealand	14.9	n.a.	20.9	18.4	13.5	9.4

Source: Long-Term Trends in Tax Revenues of OECD Member Countries 1955-1980, OECD 1981.

a. 1979 figures.

Table 7

DIRECT TAXES OF NON-FINANCIAL CORPORATE AND QUASI-CORPORATE ENTERPRISES

	A: Percentage of Gross Operating Surplus						B: Percentage of Net Operating Surplus					
	1960	1965	1970	1975	1980	1982	1960	1965	1970	1975	1980	1982
Australia	17.8(b)	21.3	20.7	22.2	21.6	21.5 (c)	24.5 (b)	30.6	29.4	32.0	29.7	30.4 (c)
Finland	14.7	17.7	10.2	12.0	7.5	10.2	29.4	37.6	20.6	23.6	14.7	18.8
France	13.3	11.8	11.8	12.3	14.0	14.5	23.7	20.8	19.8	24.1	30.0	34.2
Germany (a)	*	*	*	*	*	*	30.3	28.6	23.0	14.2	18.7	-
Italy	*	*	11.8	14.3	13.7	17.7	*	*	22.2	61.3	29.3	41.8
Japan	*	*	12.6	17.7	18.1	19.0	*	*	18.9	30.2	28.2	31.5
Netherlands	*	*	7.0	10.2	7.9	7.7	*	*	9.1	14.2	10.8	10.4
Sweden	10.0	13.5	11.3	6.2	8.3	8.6	16.6	27.0	22.3	11.8	20.6	21.6
United Kingdom	*	*	17.7	13.5	16.3	20.6	*	*	30.3	35.5	34.7	39.1
United States	26.4	23.7	20.3	17.5	16.5	8.9	43.4	34.1	34.8	30.6	30.0	17.3

a. Because of different national accounts conventions, figures for Germany consistent with those for other countries could not be obtained directly. The Secretariat has developed a proxy measure in respect of net operating surplus whose level is indicative only, but whose movements over time should be reliable.

b. 1962

c. 1981

* Not available.

Source: OECD National Accounts

productive projects and/or a shift to the labour share. In any case the decline in pre-tax profit was modified and, in some cases, possibly reversed. The high nominal interest rates of recent years are in almost all cases tax-deductible for firms recording taxable profits. Table 8 shows movements in net operating surplus adjusted for both net interest payments and tax payments; the figures indicate that growth rates have been modified in the gross case, but remain positive in nominal terms. The figures for net operating surplus after deductions are more varied, with a fall for Japan, and absolute negative results for three countries in the last year or years recorded. This suggests that some firms are not in fact making sufficient provision for depreciation, perhaps because of the use of historic cost accounting, with the consequence that they over-estimate their net operating surplus and are in effect distributing capital. Further, historic cost accounting includes stock appreciation, i.e. nominal holding gains on inventories, in gross profits, which also artificially boosts the amount firms may perceive as available for distribution. The data shown here are in National Accounts terms where depreciation is deducted at replacement cost and nominal holding gains are excluded.

53. The difference between rates of return at current and at historic cost is illustrated by data published by the Bank of England, which are reproduced in Table 9. The relationships between the two rates and the rate of inflation are shown in Table 10. It can be seen that before the rapid acceleration of inflation in the 1970s the historic rate of return tended to be about one and a half times the current rate of return. By the end of the 1970s the historic rate was four or five times higher. The historic rate is generally higher for two reasons. First, profits at historic cost include nominal holding gains, whereas current cost profits exclude them. Second, the value of the capital stock in the denominator of the ratio is artificially low because it includes capital goods valued at prices prevailing in earlier years.

54. Switches in the mix of historic cost profits between operating surpluses and nominal holding gains can make the interpretation of historic cost figures so difficult that they become almost meaningless. Moreover, because taxes are usually calculated on the basis of profits at historic costs, nominal holding gains are actually taxed even though they are not income. Such taxation is, on average, taxation of capital rather than income. Thus, the balance between taxes on income and on capital will also tend to be shifted whenever the rate of inflation varies significantly. Various ad hoc and arbitrary measures have been adopted to lower the average burden of taxation on business but there is no guarantee that the effective rate which emerges is appropriate to the proportion of profits which actually represents operating surplus.

ii) Rates of return to equity

55. While the above figures give some notion of how interest and taxes impinged on firms, a complete statement of the income accruing to the owners of an enterprise must take account of the net property income arising from financial assets or land owned by the enterprise together with the net real holding gains on assets of all kinds. Net property income consists of the difference between the receipts and payments of interest and rent, plus any dividends received. The rate of return to equity may then be defined as the total income of the business divided by the net worth of the business, where total income embraces all forms of income whether generated by the ownership

Table 8

COMPOUND ANNUAL GROWTH RATES OF GROSS AND NET OPERATING SURPLUS AFTER NET INTEREST AND DIRECT TAX PAYMENTS

1970-1981, nominal values

	Gross operating surplus after net interest payments and direct taxes	Net operating surplus after net interest payments and direct taxes
United States	12.3	11.8
Japan	5.8	-2.1
Germany	6.0	3.8
France	9.0	(a)
Italy	11.6	(a)
Finland	11.4	0.6
Sweden	9.1	(a)

Source: OECD National Accounts files and Secretariat calculations.

Note: Direct taxes are subtracted from operating surplus in the year in which payment is actually made; the tax liability may be accumulated over a number of years.

a. Compound growth rate cannot be calculated because final figure(s) negative.

Table 9

RATES OF RETURN ON CAPITAL AT CURRENT AND HISTORIC COST; UNITED KINGDOM INDUSTRIAL AND COMMERCIAL COMPANIES (a)

(percentage)

	Current cost	Historic cost		Current cost	Historic cost
1965	11.2	15.8	1973	9.1	19.7
1966	9.9	14.2	1974	6.0	20.0
1967	10.0	13.6	1975	5.2	18.4
1968	10.1	14.8	1976	5.5	20.4
1969	9.9	14.9	1977	6.9	21.1
1970	8.6	14.4	1978	7.2	21.1
1971	8.9	15.2	1979	5.2	20.4
1972	9.3	16.8	1980	3.6	15.6
			1981	2.7	13.2

a. Excluding North Sea oil activity.

Source: Bank of England Quarterly Bulletin, June 1982, p. 243.

Table 10

RATES OF RETURN AND INFLATION

	Historic minus current	Historic divided by current	Inflation (a)		Historic minus current	Historic divided by current	Inflation (a)
1965	4.6	1.4	4.7	1973	10.6	2.2	9.2
1966	4.3	1.4	3.6	1974	14.0	3.3	16.0
1967	3.6	1.4	2.6	1975	13.2	3.5	24.2
1968	4.7	1.5	4.7	1976	14.9	3.7	16.5
1969	5.0	1.5	5.4	1977	14.2	3.1	15.8
1970	5.8	1.7	6.4	1978	13.9	2.9	8.3
1971	6.3	1.7	9.4	1979	15.2	3.9	13.3
1972	7.5	1.8	6.8	1980	12.0	4.3	18.0
				1981	10.5	4.9	11.9

a. Percentage changes from previous year in the consumer price index.

Source: Data taken from Table 9.

of assets or by the use of those assets in production. Total income as defined here cannot be derived from national accounts at the present time because income in national accounts is based essentially on actual or imputed transactions and does not include real holding gains.

56. There are two quite different kinds of real holding gains and it is worth considering briefly whether it is appropriate to treat both of them as income. Real holding gains or losses on monetary assets or liabilities depend only on the general rate of inflation, whereas the real gains or losses on other kinds of assets depend on changes in relative prices. Thus, the real holding gains on tangible assets and securities depend on the price movements of individual goods and securities and are irregular and unpredictable as compared with the real holding losses on monetary assets. The real holding gain on a particular type of good may be positive in one period and negative in the next, whereas the losses incurred by holders of monetary assets are unlikely to be cancelled out subsequently in practice.

57. The distinction between current and capital items in national accounts is not precise, and depends essentially on the frequency and predictability of the relevant transactions. It can be argued, therefore, that the real gains or losses on tangible assets in any particular accounting period should, on these grounds, be treated as capital, rather than current, receipts. Economic agents may well regard them as temporary windfalls which may be reversed, or eventually cancelled out, in later periods. On the other hand, the real losses on monetary assets occur with predictable regularity. While their size may vary from period to period, so does that of other current receipts such as wages or profits.

58. Only real holding gains or losses on monetary assets and liabilities are included in income in this report. There is a much more mundane reason for excluding real gains on non-monetary assets from income; they are difficult to estimate. They require detailed price information together with detailed balance-sheet data, whereas the real gains or losses on monetary assets or liabilities can be estimated satisfactorily by applying a single, agreed price index to the total value of those assets or liabilities.

59. In any case, it is essential to include in income the gains or losses on monetary assets and liabilities, whether or not it is decided to include gains or losses on other kinds of assets. The reason is that the gains or losses on monetary assets and liabilities have a direct impact on one set of transactions actually recorded in the accounts, namely interest payments. To the extent that nominal interest payments include an element of compensation for the future real holding losses which creditors expect to incur on their assets, it is inconsistent not to take account of the actual losses which do occur.

60. Total business income as defined here, therefore, consists of the operating surplus plus net property income plus net real holding gains on monetary assets and liabilities. The relative importance of the three components of business income is illustrated in Table 11. It is difficult to obtain the requisite data needed for these comparisons, and the estimates of the holding gains, in particular, must be treated as tentative. The estimates of the holding gains are taken from the joint OECD and EEC report by Hibbert 1983 and are calculated on the basis of the consumer price index.

Table 11

THE DISTRIBUTION OF TOTAL BUSINESS INCOME

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
United States										
Net operating surplus	96	102	101	88	80	97	97	94	92	82
Net property income	-12	-12	-11	-7	-8	-15	-8	-9	-10	-8
Net real holding gain on debt	16	10	10	19	27	18	11	15	19	27
Total business income	100	100	100	100	100	100	100	100	100	100
Japan										
Net operating surplus	127	144	115	89	74	120	150	109	129	100
Net property income	-36	-55	-38	-37	-43	-73	-86	-57	-52	-43
Net real holding gain on debt	9	11	23	58	69	53	36	48	23	43
Total business income	100	100	100	100	100	100	100	100	100	100
Germany										
Net operating surplus	111	112	108	110	112	119	114	116	119	116
Net property income	-16	-18	-18	-21	-24	-27	-22	-23	-22	-21
Net real holding gain on debt	5	6	10	11	13	8	8	7	3	5
Total business income	100	100	100	100	100	100	100	100	100	100
France										
Net operating surplus		101	111	103	87	100	96	84	80	76
Net property income		-24	-27	-27	-31	-37	-36	-25	-20	-17
Net real holding gain on debt		23	16	24	44	37	40	41	40	41
Total business income		100	100	100	100	100	100	100	100	100
United Kingdom										
Net operating surplus	85	81	95	86	59	51	88	79	90	
Net property income	-13	-14	-16	-14	-23	-29	-38	-19	-15	
Net real holding gain on debt	28	33	20	29	64	78	49	40	26	
Total business income	100	100	100	100	100	100	100	100	100	

61. As non-financial enterprises are normally net debtors, it is to be expected that their income, after payment of interest, would be less than their operating profits. The extent to which enterprises rely on loan capital varies between industries and countries, but on balance it is to be expected that the income accruing to shareholders (even before the payment of business taxes) would be significantly less than the original profits out of which interest payments are made. In all of the five countries considered, net payments of property income (mainly net interest payments) have indeed constituted a significant charge against operating profits throughout, although in the United Kingdom and the United States they were not quite so important as in France, Germany and Japan. However, in all five countries the real holding gains on the net debts of enterprises have also tended to offset part, or even the whole, of the payments of net property income.

62. During the bursts of inflation following the first and second oil shocks, real interest rates tended to fall as increases in nominal interest rates lagged behind the accelerating price level. In consequence, in four out of the five countries, the real holding gains on net debt equalled, or even greatly exceeded, payments of property income in 1974-75 and to a lesser extent in 1979 also, the exception being Germany. In these countries, therefore, the income accruing to shareholders was actually equal to, or greater than, the profits generated by production during these periods.

63. In Table 12 estimates of the rate of return on equity are compared with the rate of return on production for the same five countries. The rate of return on equity is calculated as the total business income as defined above divided by the real net worth of the business. In Japan and France, the rate of return to equity appears to have been lower than the rate of return on production, at least during the 1970s, whereas in Germany and the United Kingdom the two rates tended to be similar.

64. There have been occasions when movements over time in the two rates of return have been dissimilar. For example, the sharp drop in the rate of return on production in the United Kingdom between 1974 and 1975 was not matched by such a sharp fall in the rate of return of equity. The explanation is apparent from Table 11 which shows that in 1975 the increased real holding gains on debt in the United Kingdom actually exceeded the level of profits being earned on production. Another example is provided by France where there was a significant decline in the rate of return on production between 1973 and 1979 without any corresponding decline in the rate of return on equity because of an increase in the relative importance of real holding gains on debt.

65. In general, the relationship between rates of return on production and on equity will depend on the size of the gearing ratio and the behaviour of realised real rates of interest. Real interest rates fell sharply in 1974-75 in most countries, with large negative rates being observed in some countries. In these circumstances, the effects of any decline in the rate of return on production on the rate of return to equity are bound to be considerably mitigated as the real holding gains on debt rise relatively to interest payments. The converse applies, of course, when real interest rates rise in which case any decline in the rate of return on production will be compounded as interest payments rise relatively to the real holding gains on debt, reducing the rate of return on equity relatively more than the rate on production (while also reducing cash flow).

Table 12

RATES OF RETURN TO EQUITY AND RATES OF RETURN TO PRODUCTION: NON-FINANCIAL CORPORATE SECTOR
(percentages)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
United States										
Rate of return to equity	12.1	12.3	13.7	16.0	13.8	11.5	12.5	13.9	14.3	14.7
Rate of return to production	..	..	..	..	..	..	..	..	..	..
Japan										
Rate of return to equity	14.5	9.9	11.1	12.4	12.1	7.5	6.6	9.2	8.5	9.8
Rate of return to production	32.0	24.8	22.7	19.6	15.2	13.5	14.5	14.4	15.8	14.7
Germany										
Rate of return to equity	22.0	20.6	21.2	20.7	18.9	17.0	19.0	18.3	18.0	18.1
Rate of return to production (a)	22.0	20.4	19.9	19.4	17.7	16.5	18.2	18.4	18.9	19.2
France										
Rate of return to equity	..	7.3	7.2	7.6	8.0	5.5	4.9	6.7	7.1	7.4
Rate of return to production	..	14.6	14.7	14.2	12.2	9.4	7.9	9.2	9.3	9.6
United Kingdom										
Rate of return to equity	7.8	8.2	7.3	7.9	7.5	6.5	4.7	7.7	7.2	..
Rate of return to production (b)	7.8	7.8	8.0	7.8	4.9	3.6	4.3	6.6	6.9	..

Source: Hibbert, 1983 and OECD National Accounts.

a. Net rate of return for Industry, transport and trade used as a proxy for the non-financial corporate sector.

b. The coverage of these data is not exactly the same as those in Table 9.

iii) Overall profitability and inflation

66. The analysis above suggests that the squeeze on overall profitability has been more marked than on the profitability of production during the period of high and rising real interest rates which began in the late 1970s and continues into the 1980s. (If inflation expectations are higher than current rates of inflation real interest rates may be somewhat lower than calculated but it is unlikely that this would undermine the general point.)

67. At the same time, the persistence of historic cost accounting for tax purposes combined with rising inflation during the 1970s tended to squeeze cash flow, depressing after-tax returns and diminishing the role of profits as a financing source. By the end of the decade, company capital structure tended to reflect the growing importance of external compared to internal funds (6) and also a growing proportion of short-term debt in the face of high nominal interest rates, with equity issues stagnant.

68. It is usually assumed that the balance of equity, borrowing and retained earnings is adjusted by the firm to minimise its total cost of finance, given the tax structure and within constraints imposed by the risks associated with excessive dependence on borrowing and financial market valuations of its equity. That is, the market can be expected to react to higher gearing but not to the extent predicted by the Modigliani-Miller theorem (7) (which holds that share prices will fall as borrowing goes up so as to keep the total cost of finance constant).

69. The interaction of inflation and the tax structure is likely to vary the desired mix of finance as there will be different marginal effects on dividends, retained earnings and interest payments. However, the scope of firms to vary their financing mix was constrained during the 1970s not only by a downward trend in retained earnings, but through the depressive effect of low stock market valuations. This made it difficult to float new issues, a difficulty which was itself related to inflation, though this is not to exclude that the fall in stock markets also reflected real factors. The idea that inflation and the tax structure combine to depress stock market valuations is convincingly argued by Feldstein (1980) (8). The outcome of this pincer movement on finance was an extensive dependence on external loans, which benefited from the tax deductibility of nominal interest payments. However, higher inflation also made long-term loans more risky so borrowing became more short term.

70. As well as changing the cost and mix of finance, the effects discussed above influenced the incentive to invest and shortened pay-off periods, in turn affecting the pattern of investment and possibly also the total amount. A broad look at investment behaviour suggests that because the growth of GDP as well as of investment was sluggish, investment/GDP ratios held up reasonably well during this period (see Table 13).

71. Subsequent declines in inflation eased some at least of these constraints, reviving stock market valuations and enabling companies to lessen their dependence on short-term borrowing by floating new issues. Although real interest rates remained high, their impact on costs was reduced to some extent by the shift to alternative sources of finance. However, they were still influential through their effect on the cost of capital and the relative profitability of investment in physical and financial assets. An approach

Table 13

INVESTMENT SHARES: RATIO OF NON-RESIDENTIAL INVESTMENT TO GDP
(per cent)

	1955-62 (a)	1963-70	1971-77	1978-81
United States	12.9	14.0	13.7	14.6
Japan	23.0	26.2	25.4	24.5
Germany	16.5	17.6	15.7	15.5
France	15.3	16.9	16.2	15.1
United Kingdom	13.2	14.7	15.3	14.6
Italy	16.5	14.6	14.9	14.2
Canada	17.6	17.8	16.9	17.8

a. The ratios are calculated in current prices. Data in growth rates are from 1955.

Source: OECD National Accounts.

Table 14

RATIO OF MARKET VALUE TO REPLACEMENT COST
OF NET ASSETS (a): UNITED STATES
1955-82

1955	1.112	1970	1.091
1956	1.104	1971	1.176
1957	1.018	1972	1.258
1958	1.041	1973	1.157
1959	1.252	1974	0.827
1960	1.222	1975	0.811
1961	1.350	1976	0.911
1962	1.282	1977	0.797
1963	1.419	1978	0.761
1964	1.521	1979	0.709
1965	1.621	1980	0.666
1966	1.466	1981	0.694
1967	1.480	1982	0.690
1968	1.523		
1969	1.353		

Source: Economic Report of the President, 1983, Table B-88, "Determinants of business fixed investment 1955-1982".

a. Equity plus interest-bearing debt divided by current replacement cost of net assets.

based on these considerations is presented now drawing on results for the United States and the United Kingdom.

iv) An alternative measure of profitability

72. As noted earlier, it is difficult to disentangle the concept of profit most appropriate for activity and investment. In principle, the expected profitability of production after tax relative to the cost of capital (the "pure" profit rate) is what is relevant for investment. The cost of capital, including the cost of financial capital from all sources, tax provisions and expected depreciation is exceedingly difficult to measure. Real interest rates provide some, albeit limited indication. It is evident from Chart B that pure profit rates measured on this basis in the 1980s are much less favourable than those prevailing in the 1960s and early 1970s when ex post real interest rates were negative.

73. An approach to isolating the concept of profit which would function best as a determinant of economic activity is to use market valuations of companies as these reflect expectations of profitability. They would, of course, reflect expectations of all profits not simply operating surpluses. Nonetheless by explicitly considering the demand and supply prices of capital the disequilibrium or "pure profit" element in expected company performance can be approximated. In what follows, this approach is discussed in greater detail and some results for the United Kingdom and the United States are shown.

74. As noted earlier, the cost of capital will be a weighted average of loans, equity finance and retained earnings, which in imperfect markets, and in the presence of uncertainty and different perceptions of risk and opportunity cost, cannot be represented by a single interest rate. The alternative measure of the cost of financial capital developed in recent years takes the overall rate at which the market discounts a company's future income (F) stream when valuing its securities, where future income is earnings post-tax in the form of interest, dividends and retentions. Thus the ratio of future earnings (F) to the financial valuation (V) gives a measure of the cost of capital taking into account all sources of finance. Future earnings are subject to the measurement problems discussed earlier with reference to ex ante profits, which enter the formulation for expected rates of return (future income relative to the capital stock measured at replacement cost).

75. However, expected profitability is the ratio of future earnings post-tax (F) to the real value of replacement cost of trading assets (K). If this ratio is taken relative to the overall cost of capital under the alternative measure, the term for future earnings drops out, leaving the ratio of the current financial valuation to the stock of capital (9). Hence investment is a function of the valuation ratio (also known as Tobin's q, (see Tobin 1969). When the valuation ratio exceeds one, it will pay to invest further in physical capital; if less than one, the expected returns are greater to financial than to physical investment. As adjustment is slow, particularly where the real capital stock is concerned, and valuations can move rapidly, there is a continual process of adjustment and readjustment going on which may not relate directly to the current valuation ratio. However, calculations by Flemming, et.al. (1976) for the United Kingdom show very similar movements in the valuation ratio and in investment.

76. This method has the advantages of by-passing the problem of estimating future earnings and of taking into account the effects of taxation, risk and uncertainty. Inflation is not an explicit argument but affects the function insofar as it is implicit in the market valuation. For instance, if uncertainty were perceived to be greater, possibly because of higher and more variable inflation rates, this would result in a higher yield being required to cover the increased risk premium. Other things being equal, the market valuation would fall, depressing investment. This argument is suggestive for the 1970s. Problems in estimating the stock of capital at replacement cost remain, and the data collection required to calculate the financial valuations is formidable. It has been attempted for a few countries, as shown in Tables 14 and 15. The Bank of England data in Table 15 show in full both parts of the ratio -- the cost of capital and the future post-tax rate of return -- as well as the valuation ratio itself. From this it can be seen that the valuation ratio fell below 1 in the United Kingdom in 1974, when there was a substantial fall in expected profitability, well before the strong rise in the cost of capital which began in the later 1970s. The valuation ratio also fell below 1 in the United States in 1974.

E. Towards a secular recovery in profits?

i) The short-term forecast

77. Data for the manufacturing sector have been projected to 1985 (Chart B) to illustrate the possible movement in profit rates in the near term. These suggest that the widespread pick-up in profit shares and rates of return recorded in 1983 and 1984 is likely to continue. This, however, appears likely to be due to a cyclical upturn in the United States, the United Kingdom and Canada, where the recovery in industrial output had been most pronounced. In Japan, Germany, France and Italy, on the other hand, where the recovery in industrial output has been anaemic, profit rates held up better than can be explained by purely cyclical factors (see Annex II). It is not yet clear, however, that there has been any reversal of long-term trends. By 1983 profit shares and rates of return were both still well below those prevailing in the early 1970s and even further below those of the 1960s. The recovery in rates of return is particularly marked in the United States, Canada, Japan and Germany. But even there, realised rates in 1983 are close to the fitted trend which continues to be negative on the basis of a nine-year moving average. A reversal of this trend appears to be emerging in Japan, Belgium, Italy and Sweden. In general, rates of return appear to have fallen more sharply than profit shares in cyclical downswings such as 1975 and 1982 because capital productivity is more cyclically volatile than labour productivity; conversely, the recoveries in rates of return in 1976 and 1983 appear to be more robust than those in profit shares. However, how long this situation may continue is difficult to say, given uncertain estimates of capacity utilisation and the effective capital stock. At the same time, real interest rates in 1983 and late 1984 remain at near-record post-war high levels, so that the recovery in "pure" profit rates remains subdued.

ii) The medium-term projection (MTP)

78. A brief medium-term projection of possible profit developments was also made to provide perspective to the short-term forecasts. The sustainability of the current recovery in profits was assessed on the assumptions of

Table 15

RATIO OF FINANCIAL VALUATION TO REPLACEMENT COST OF CAPITAL: UNITED KINGDOM

1963 to 1982

	Valuation ratio	Cost of capital	Forward-looking post-tax rate of return
1963	1.63	5.7	9.3
1964	1.60	5.9	9.4
1965	1.31	5.1	6.7
1966	1.16	6.3	6.0
1967	1.19	5.2	6.2
1968	1.51	3.6	5.4
1969	1.30	4.1	5.3
1970	0.97	5.1	5.0
1971	1.07	4.6	4.9
1972	1.17	4.9	5.6
1973	1.16	3.9	4.6
1974	0.67	3.7	1.9
1975	0.76	3.0	2.3
1976	0.75	5.3	3.9
1977	0.89	7.5	6.7
1978	0.90	8.1	7.3
1979	0.91	7.2	6.4
1980	0.67	7.0	4.2
1981	0.60	9.0	5.4
1982	0.78	8.0	6.2

Source: Bank of England.

continuing modest growth from 1985 to 1988 (averaging 2 1/2 to 3 per cent for the area as a whole) and stable low inflation of 4 per cent. Data availability limited this comparison to the manufacturing sector. Profit shares and rate of return projections for the seven largest countries to 1988 were developed using the baseline forecasts embodied in the Economic Outlook 36. The GDP deflator was adjusted to allow for the tendency for goods prices to rise less rapidly than services due to higher sectoral productivity gains. The ratio of the goods output deflator to unit labour costs was taken as an indicator of changes in profit margins, which were then chain-related to base-period shares of gross operating surplus in value added. Capital stock estimates were projected forward using baseline investment forecasts, standard assumptions on scrapping and the perpetual inventory method. This allowed a projection of both gross operating surplus shares in value added and rates of return on gross capital stock.

79. Gross manufacturing operating shares in the United States, Canada, Italy and Germany generally rise or remain stable (Chart B extended). Trends in rates of return are similarly more buoyant, largely on account of a projected recovery in capital productivity. Rates of return in manufacturing by 1988 would still remain below the levels prevailing in the mid-1960s. Thus, despite a continued slow improvement in realised rates of return, a projection into the medium term does not appear at this stage to imply any fundamental reversal in longer-term profit trends.

IV. WHY HAS IT HAPPENED?

A. General considerations

80. Data presented in Part III show a widespread trend decline in profit rates for the whole period 1960 to 1982 and, in a number of countries, a decline in profit shares as well. In the 1970s these phenomena became general and were accompanied by low rates of economic growth and depressed capacity utilisation. Hypotheses advanced to explain the drop in profits need to account for the declines in both, very different, decades. A question frequently asked is how far the 1970s decline was symptomatic of the decline in growth and capacity utilisation or, conversely, how far lower profits were a proximate cause of these events -- and in that case too, what lay behind the proximate cause. A related question concerns the extent to which these events were cyclical, perhaps reinforced by unusual special factors (10), or were long-run trends. Indeed, some of the "special factors" (such as the oil shocks) could themselves be regarded as representing the working-out of longer-run trends. This section sketches approaches to profit determination as well as possible avenues for testing.

81. First, it is useful to distinguish what is meant by "profit determination" and the nature of the causation involved. As discussed earlier, profits are a residual, in both the economic and National Accounts sense of the word, and a composite whose components have varying economic significance. In most models, they are a by-product of the mechanisms by which fundamental causal variables work their way through; in other words, they are an endogenous variable which is determined jointly along with all other endogenous variables. By the same token, it is difficult to regard

profits themselves as a cause, except in a narrow, proximate sense, of economic outcomes. That is, profits may be a channel through which causal variables have their impact. Thus regarded, they are an intermediate variable and may serve as a useful signal of the processes which are going on but are not a fundamental determinant in a systemic sense.

82. It may make little sense, therefore, to ask whether the decline of profits in the 1970s was symptomatic of a more general decline in economic growth or whether it was a proximate cause of that decline. According to the reasoning above, both are likely to be true, in the sense that profits, rates of return and investment were all jointly determined within the system as a whole. However, it remains useful to address the partial and proximate causes of the decline in profits for which a number of explanations can be canvassed and at which policy may perhaps be directed. At a later stage it could also be interesting to attempt to quantify some key interrelations in the system so the extent of profits' role as cause and effect can be gauged.

83. The aggregate production function is the theoretical framework adopted for many attempts to estimate the contribution of technical progress, factor supply shocks and variations in capacity utilisation to the slowdown in rates of productivity and output growth and hence to developments in recorded profitability. Profits emerge from this approach as the residual result of the interplay of more fundamental variables. The model usually assumes profit maximisation and its steady-state equilibrium nature implies that profits only exist in the sense of normal factor returns. Supernormal profits, a disequilibrium phenomenon attributable to innovation, uncertainty, etc, find no place. Nonetheless, the model provides a consistent way of examining the long-run impact of (endogenous) relative factor price changes caused by developments in factor supply and technical progress. It can also by defining potential, normal or equilibrium output permit a more precise definition of capacity utilisation so that the role of this factor in short-term fluctuations in profits can be measured. This approach has been used by the Secretariat in recent work on a three-factor, aggregate production function model, which attempts to explain productivity developments by movements in the intensity of utilisation of employed factors due to deviations of output from its expected value, by factor substitution, and by changes in the (Harrod-neutral) rate of technical progress.

84. This model when fitted over a twenty-year period yields data for a profits series constructed by using a concept of normal business costs, defined as the average for the period as a whole. Deviations from the average indicate the presence of supernormal profits or losses which would cause the firm to adjust in the short run the intensity of utilisation of its employed factors and in the longer run its capital stock and labour force. This method requires that firms take the twenty-year average as their notion of normal business costs, although the long-run decline actually experienced in the return to capital might be expected to cause them to revise downwards their notion of what constituted a normal return. This would make year-to-year deviations later in the period appear less marked. However, because the level of normal cost including normal profits is defined as the twenty-year average, the deviations include both cyclical and trend elements. Data from the Secretariat's model show a broadly similar picture to that conveyed by National Accounts statistics and valuation ratios (see Table 16). The long-run decline in this concept of profit is not explained within the model,

Table 16

INVERSE MEASURE OF PROFITS PER UNIT OF OUTPUT (a)

	United States	Japan	Germany	France	United Kingdom	Italy	Canada
1960	0.981		0.897	0.971	0.845		0.937
1961	0.970		0.904	0.968	0.876	0.870	0.944
1962	0.950		0.919	0.953	0.875	0.888	0.929
1963	0.937		0.935	0.947	0.856	0.913	0.919
1964	0.933		0.927	0.936	0.880	0.962	0.915
1965	0.919		0.954	0.939	0.901	0.944	0.907
1966	0.926	0.980	0.998	0.932	0.918	0.921	0.912
1967	0.935	0.959	0.972	0.925	0.918	0.917	0.937
1968	0.946	0.945	0.949	0.935	0.941	0.912	0.941
1969	0.974	0.927	0.947	0.938	0.989	0.899	0.966
1970	1.010	0.928	1.016	0.948	1.006	0.954	0.985
1971	0.986	0.951	1.015	0.947	0.972	0.971	0.958
1972	0.976	0.926	1.009	0.929	0.959	0.957	0.957
1973	0.970	0.961	1.051	0.945	1.011	0.960	0.937
1974	1.022	1.061	1.104	1.016	1.158	1.008	0.983
1975	1.040	1.080	1.075	1.041	1.186	1.093	1.027
1976	1.025	1.079	1.039	1.048	1.163	1.115	1.023
1977	1.014	1.052	0.997	1.065	1.098	1.147	1.036
1978	1.024	1.023	0.978	1.051	1.074	1.122	1.056
1979	1.057	1.037	1.021	1.042	1.115	1.108	1.081
1980	1.130	1.073	1.064	1.133	1.171	1.121	1.157
1981	1.162	1.096	1.140	1.193	1.222	1.247	1.251
1982	1.175	1.094	1.113	1.178	1.146	1.255	1.301

a. Total business profits normalized over a twenty-year period. Values below unity represent super-normal profits.

except compositionally, in the sense that movements in its components can be explained.

85. The components are defined so as to bring out the effect of changes in factor prices and shares, which can presumably be related in turn to productivity changes, intensity of utilisation and the degree of competition. Implicitly, therefore, profits are present as both intermediate cause and effect of the phenomena which the Secretariat's model attempts to explain. This approach cannot ascribe a role either as original cause or final effect to profits, but can possibly throw light on the productivity developments which affect both profit shares and rates of return.

86. Another class of models attempts to cut through the general interactions of the economic system and sees the share of profits in output as mainly determined by the share of investment in output. This is partly because there are thought to be dynamic scale economies: e.g. increased investment yields "learning-by-doing" in the capital goods industry and hence greater capital productivity. On this basis, the trend decline in profits would have been caused by the decline in investment. Such models embody a key difference of view about the stimulation of investment from that of neo-classical models. External causes such as the "animal spirits" of entrepreneurs or the role of government policy in lowering output expectations must be sought before the decline in profits can be explained.

87. From this point of view it may be interesting to note the results of some recent work by the Secretariat using techniques for causality testing, in trying to sort out whether investment "causes" profits or vice versa. In five large countries out of six, unusual movements in profits do tend to be associated with subsequent unusual movements in investment. Hence, previous years' profits have in the past appeared to exert a strong positive effect on current investment. (This holds for the United States, Japan, Germany, France, and Canada; the United Kingdom is an exception (11).) However, this relation is short-lived; while investment the following year is apparently affected by unusual profits, that in subsequent years is apparently not. It is natural to suspect that this result stems simply from the fact that rates of return are a coincident series in the business cycle while investment tends to lag, hence rates of return lead investment. However, insofar as the relationship holds even when systematic trend and cyclical elements have been removed from both series, that cannot be the explanation. The short-run nature of the relation suggests it may be the financing or cash-flow role of profits rather than the effect of current profits on future profit expectations that is most important. Furthermore, there is no sign of a "virtuous (or vicious) circle" whereby high investment boosts activity and subsequently raises profit rates. Indeed, in several of the five countries higher current investment occurs with lower coincident and future rates of return, in line with neo-classical theory predicting a decline in the marginal productivity of capital after a bulge of investment (see Annex, Table II.2).

88. This preliminary analysis suggests that the links running from rates of return to investment are indeed stronger than the opposite relation. These findings are thus more in the spirit of the neo-classical determination of rates of return than of the post-Keynesian increasing-returns model.

B. Proximate causes

i) The rate of technical progress

89. An often-cited reason for the generalised decline in profit shares and rates of return in the 1970s is a slowdown in the rate of technical progress. This hypothesis has important implications. If it could be substantiated, it could throw some light on the drop in total factor productivity since 1973 remarked on in Part IV(iv) below (see Table 23). In particular, it could help to explain the steady drop in capital productivity dating in many countries from the 1960s. Unfortunately, aggregate-level empirical research based on growth accounting provides little insight into either the nature or particularly the causes of technical change. Two related problems are discussed below: what is technical progress and how can it be measured?

a) What is technical progress: problems of measurement and causation

90. The concept of technical change has typically been examined within a framework of neo-classical production function theory. In its simplified, aggregate and empirically implementable form, this assumes that aggregate supply can be modelled "as if" there were perfect competition, constant returns to scale and Harrod-neutral technical change, so that the profit maximising firm assures a continuously efficient allocation of resources. At an aggregate level, when all inputs into the production process are accounted for and weighted according to their shares in total returns, the residual, if any, will be a measure of the "shift" in the aggregate production function and hence of technical advance over time.

91. From growth accounting literature, it is clear that this residual is a "hodge-podge" or a measure of ignorance. Research in the 1960s and 1970s has attempted to reduce the residual by introducing factors beyond the traditional scope of neo-classical production theory. This research has been devoted to disaggregating first labour and later capital inputs. Increases in "human capital", education and on-the-job-training have all been cited as important factors. Similarly, the mix of the capital stock between machinery and equipment and structures has been considered, as well as the average age of the capital stock, on the assumption that some technical progress is embodied in successive vintages of capital. Despite these efforts, little that is conclusive has emerged. Indeed, it is becoming increasingly apparent that the aggregate neo-classical framework on which the analysis is based is ill suited to discriminating among competing explanations of technical progress. Proxies for some of the additional factors are hard to find and many things are correlated over time with measures of the residual. Extracting measures of relative importance from poor and collinear data is difficult, tracing causation impossible.

92. There is even doubt about whether the conceptual framework is appropriate for these particular purposes. For example, evidence of "learning-by-doing" suggests that technical change may be related to the growth of output and capital stock (though as noted above, any such scale economies do not seem to boost profits). Capital and technical progress may therefore be indistinguishable. If economies of scale are pervasive, as indicated in a number of micro-level studies, this means that output growth and productivity growth cannot be disentangled. An implication, if technical

change is related to output growth, is that a prolonged decline in capacity utilisation has slowed growth in technical progress. However, the extent of changes in capacity utilisation is difficult to assess because of measurement problems relating to the capital stock. On the one hand, it is possible that there has been accelerated scrapping due to sudden obsolescence brought on by relative price shocks; on the other, it may be that quality changes have been underestimated (as discussed in Annex I), with the net result that existing capacity is actually larger than is frequently believed and the decline in utilisation more pronounced. The somewhat negative conclusion is that, in this particular area, only limited insight can be obtained from the aggregate "theory" of production; understanding of technical change requires a more detailed, probably historical approach.

93. The most commonly used measure of ex post technical change is the trend in total factor productivity. This measure follows the approach of Solow (1963), whereby actual or trend-adjusted factor inputs in the production process are attributed weights according to their shares in total factor income. This highlights the magnitude and timing of the drop in measured productivity, but provides no explanation as to its origins. A crucial question is whether the generalised drop in total factor productivity since 1973 and the marked but less general drop in capital productivity since the 1960s does denote a shift in either the nature or speed of technical change or whether it is mainly a measurement problem relating to the capital stock.

94. Some studies have attempted to resolve this issue by treating research and development (R&D) expenditure as a specific input into the production process. This is much in the spirit of trying to correlate various proxy variables with the production function residual, as referred to above (other proxy measures have included number of patents, scientists and engineers, etc.) (12). While R&D no doubt plays an important role in explaining technical change, labour productivity levels are not systematically related to R&D expenditures (13). Nor is it always clear that the pay-off from R&D in terms of the stock of exploitable knowledge bears a stable relation to expenditure. Innovation is an uncertain affair. In short, the issue is not resolved. Nonetheless, in the absence of evidence of increasing bias in capital stock measurement it seems reasonable to characterise the slowdown in total factor productivity as a slowdown in technical progress -- while admitting this is more description than explanation.

b) The productivity gap hypothesis

95. One explanation for the slowdown in technical change and the drop in capital productivity is provided by the productivity gap hypothesis. This hypothesis is that measured total factor productivity and technical change in the immediate post-war period was temporarily boosted by an unusual set of circumstances. There were abnormally high quasi-rents, which have subsequently been eroded by the mobility of international capital, the diffusion of technical knowledge and a closing of productivity differentials between countries (Table 17).

96. A corollary of this hypothesis is that inter-country post-war profit performance can be ordinally ranked according to labour productivity levels vis-à-vis the United States immediately after the War. The rationale for this argument is that the United States inherited a strong competitive advantage in technically advanced sectors (capital and durable goods). Other countries

Table 17

ABSOLUTE PRODUCTIVITY LEVELS IN MANUFACTURING: 1975 EXCHANGE RATES
(United States = 100)

	United States	Japan	Germany	France	United Kingdom	Italy	Canada	Belgium	Denmark	Nether-lands	Norway	Sweden
1950	100.0	11.8	46.1	45.6	42.4	34.8	69.5		51.9	28.8	81.5	76.0
1951	100.0	14.2	46.0	46.5	41.1	37.5	69.9		50.7	28.8	82.6	75.6
1952	100.0	14.7	49.4	47.2	38.7	38.4	70.4		49.5	29.0	79.4	74.1
1953	100.0	16.4	54.0	48.7	40.0	39.6	71.6		49.4	30.7	81.1	76.8
1954	100.0	17.2	53.4	49.5	40.7	41.0	73.7		50.7	31.3	83.4	75.7
1955	100.0	17.3	54.2	49.4	40.0	42.5	74.7		49.4	31.5	79.2	72.9
1956	100.0	18.5	55.9	53.4	40.3	45.2	78.4		51.3	33.6	84.9	77.9
1957	100.0	19.8	59.7	53.8	40.5	45.2	77.4		52.1	34.2	85.8	80.5
1958	100.0	18.6	62.8	55.9	41.5	46.1	80.3		54.1	35.1	87.6	84.3
1959	100.0	20.7	65.0	56.9	41.2	47.4	80.8		55.2	35.9	88.4	85.5
1960	100.0	23.7	69.0	60.8	42.8	50.0	83.1	54.3	56.6	37.5	93.6	87.6
1961	100.0	26.1	70.9	62.6	41.8	52.7	85.3	53.5	58.2	38.5	94.1	89.4
1962	100.0	26.1	72.2	63.4	40.9	55.9	86.0	54.0	58.7	38.1	90.1	92.0
1963	100.0	26.3	70.4	62.4	40.2	53.6	83.3	52.3	56.5	36.5	86.7	90.8
1964	100.1	28.4	72.7	63.9	40.9	54.1	82.9	53.0	58.3	38.2	87.4	93.8
1965	100.0	28.7	75.3	66.2	40.9	58.3	83.5	54.0	59.3	39.3	88.9	97.5
1966	100.0	31.3	77.5	70.8	41.8	61.5	85.4	57.1	61.6	41.5	91.0	100.4
1967	100.0	35.9	82.1	75.1	43.8	65.2	88.1	60.4	67.1	44.3	95.0	108.8
1968	100.0	39.1	85.0	80.1	45.4	67.9	91.0	63.5	70.6	48.0	96.6	114.7
1969	100.0	44.4	89.3	83.4	45.7	71.9	94.7	68.1	72.2	51.6	103.8	121.3
1970	100.0	50.1	91.8	88.2	46.8	75.5	96.2	75.3	77.0	56.6	106.3	126.8
1971	100.0	50.2	90.0	87.7	46.3	73.3	97.2	75.0	77.0	56.9	104.0	124.5
1972	100.0	53.3	91.4	88.4	47.2	75.5	96.6	79.7	79.4	58.6	104.2	124.4
1973	100.0	55.7	91.9	88.8	47.9	80.3	97.4	84.1	83.1	61.2	104.8	126.8
1974	100.0	58.5	99.2	94.3	50.1	86.3	102.0	91.5	87.8	67.9	110.8	135.2
1975	100.0	59.0	99.9	95.3	48.3	80.2	96.6	92.5	94.3	64.8	106.7	133.3
1976	100.0	61.8	102.1	98.0	48.6	83.3	97.4	98.4	93.7	70.0	105.3	129.6
1977	100.0	64.6	103.6	100.7	47.6	82.2	98.9	101.1	93.2	71.0	102.9	124.2
1978	100.0	69.1	105.4	105.7	47.8	84.0	99.7	106.9	94.7	75.1	103.9	126.7
1979	100.0	74.8	109.6	109.7	48.1	89.5	102.0	113.2	99.5	78.3	108.7	135.7
1980	100.0	81.8	110.9	111.2	47.6	94.5	99.5	115.9	100.7	79.8	111.3	137.7
1981	100.0	83.5	109.6	109.9	49.0	94.5	98.5	118.2	104.2	78.9	109.5	133.5
1982	100.0	85.9	110.1	113.6	50.2	94.5	94.7	122.8	104.0	80.5	108.0	133.6

Source: U.S. Bureau of Labor Statistics and Secretariat calculations.

with skilled labour forces consequently had a vast back-log of advanced technique to draw on; the payments of royalties and licensing fees being quite small in relation to the resource costs of launching education and R&D programmes to close the technological gap (14). Thus, countries which ended the war with severely damaged or depleted capital stocks (Japan, Germany, Italy) and low capital-intensity of production started the post-war reconstruction era with productivity in manufacturing of barely a tenth or a third that of U.S. levels. These countries probably benefited most in exploiting this technological gap which was eventually largely eliminated by the mid-1970s. By contrast, other countries which suffered less severe war destruction (Canada and the United Kingdom) were faced with less marked exploitable profit opportunities. This relation is illustrated in Chart C, where average absolute productivity levels in manufacturing vis-à-vis the United States and rates of return are graphed for the five-year periods 1950-54 and 1955-59.

97. A key aspect of this hypothesis is the systematic expected relation between initial absolute post-war productivity levels vis-à-vis the United States and capital productivity. This hypothesis is not inconsistent with the general decline (from the early 1970s) in the growth of measured technical change, as productivity levels between countries had become closely aligned through international capital mobility and the diffusion of technical change (Nelson 1983). The OECD Secretariat has attempted to test this hypothesis in re-estimating the supply blocks of econometric models for seven countries (in a three-factor aggregate production function framework). It was found that imposing the condition that the rate of technical change, in countries other than the United States, asymptotically approaches the rate in the United States fits the data better than alternative formulations (15). An implication of the technological catch-up hypothesis is that the 1950s were abnormally favourable for profits. Hence, an examination of the origins of the slowdown in capital productivity in the mid or late 1960s and 1970s should be assessed against the perspective of long-run historical trends. This may imply that recent and perhaps future advances in technical change and profits may now be more related to expenditures in R&D, innovation and the actual growth of the capital stock, than in the past decade in many countries. However, there is one severe limitation of the catch-up hypothesis. It provides no explanation of productivity growth in the United States -- the assumed "frontier" country. In particular, it would imply that the United States is one country that should not suffer a slowdown in productivity growth as a result of the closing of the levels gap. In fact, of course, the slowdown in U.S. productivity growth has been most striking (16).

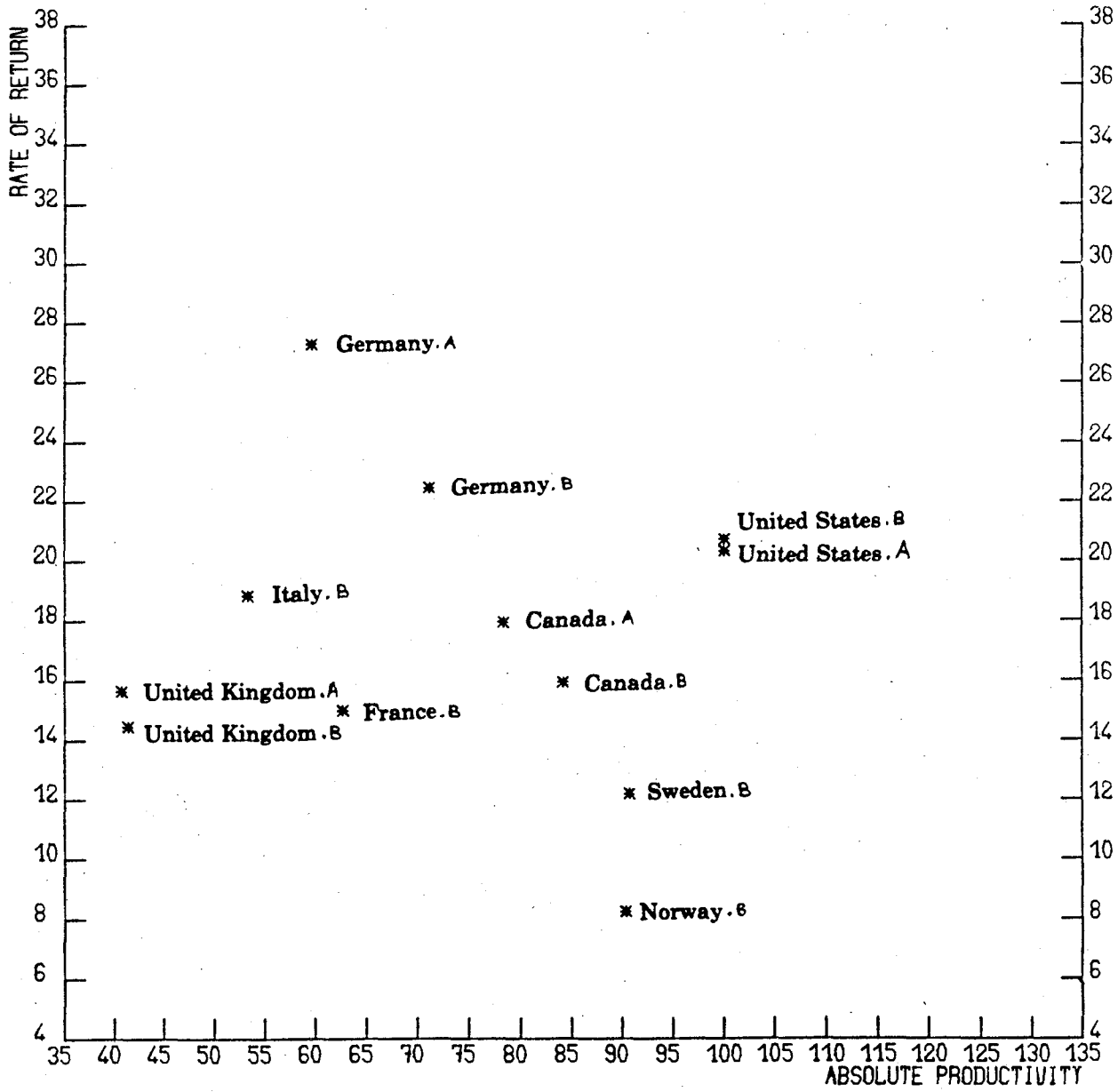
ii) More severe competition

98. A basic tenet of neo-classical price and distribution theory is that perfect competition will equalise rates of return between competing activities. Extending this model to include international trade, Stolper and Samuelson have argued that free trade in goods could, in theory, be a complete substitute for factor mobility. Both theories regard supra-normal profits as a disequilibrium phenomenon. Hence, increased domestic or international competition will unambiguously reduce quasi-rents and monopoly profits.

99. A limitation of this abstract model of profit determination is that the real world is probably best characterised as in a continual state of disequilibrium. A continuing stream of shocks (innovation, technical

Chart C

ABSOLUTE PRODUCTIVITY AND RATE OF RETURN



Note: A = Means 1955 to 1959
B = Means 1960 to 1964

progress, government regulation, uncertainty) can be expected to generate a flow of quasi-rents. In the absence of a testable theory of the origins of technical change and innovation, there is probably little a priori reason to expect anything than a random walk in terms of quasi-rents. Indeed, it is striking to note that rates of return on capital vary markedly between firms, industries, sectors and countries, and these differences have persisted for decades if not centuries. Nonetheless, the neo-classical model does suggest a number of testable hypotheses concerning the role of competition. A number of complementary ones are noted below.

a) Domestic concentration

100. Analyses of domestic competition and price setting behaviour have stressed the role of industry or sales concentration, especially in North America. Less concentrated industries are frequently thought to have a greater degree of price flexibility over the business cycle and lower monopoly rents. The degree of industry concentration would be expected to be systematically correlated with inter-industry profit performance. Changes in specific industry concentration over time would also be expected to influence profit trends. One complication is that concentrated industries are often dominated by large unions. Hence, while capital and labour may obtain rates of return above those prevailing in competitive industries, the effect on the division of factor incomes is ambiguous.

101. Of course, in terms of community welfare, industry concentration is not necessarily bad. In some large-scale capital-intensive industries, concentration of production in a few units may be necessary to exploit economies of scale and best-practice techniques. In some of these sectors, realised profit rates may be determined as much by capacity utilisation as by concentration. Hence, in some instances firms may actually lower profit margins to expand output and reduce overhead costs (e.g. the chemicals and airline industries). A recent OECD study of pricing behaviour in five countries (the United States, Japan, the United Kingdom, Canada and Sweden) found that the post-1979 recession witnessed a greater than usual degree of overall price flexibility, with concentrated industries exhibiting a faster than usual price response to cost changes. (In general, however, concentrated industries continued to show less price variation, and therefore less variation in profits, over the cycle than less concentrated industries (Encaoua 1983).) This was a break in the trend towards greater price rigidity in concentrated industry with successive recessions. To the extent that this was not primarily a reflection of the depth of the particular cycle, heightened competition might explain part of the recent decline in profits.

b) The expansion of world trade and import penetration

102. A particular form that intensified competition might take is the greater openness of economies leading to more intense competition from imports. This can occur because technical progress reduces transport costs or because economic development means more countries' exports are competing on the same phase of the product cycle. The interdependence between foreign trade and profitability needs to be analysed at a disaggregated, sector or preferably industry-specific level. Foreign competition and relative competitiveness are likely to be relevant constraints on the pricing policies of individual firms, particularly in open economies, but this is not always visible in aggregate data.

103. Import penetration or the share of imports in domestic sales and production is a commonly used proxy for the degree of import competition. That is not wholly satisfactory, because it is the elasticity of import supply relative to changes in domestic prices that constrains domestic producers from passing on costs directly into prices and this may or may not result in an ex post increase in import penetration. To illustrate, one empirical study (17) found that changes in import competition are correlated with changes in profitability of specific industries, once allowance is made for differences in concentration. The rationale is that the degree of import competition has a direct effect on profitability in highly concentrated industries (18). When concentration is weak, purely domestic competitive factors can be expected to hold profits at a competitive level. This pattern of industry pricing was also noted at a 4 to 5-digit ISIC level of disaggregation for six countries by Encaoua. In particular, the ease with which industry passed unit cost increases into prices was directly related to the degree of import penetration.

104. A particular hypothesis is that much increased competition is owing to the development of newly industrialising countries making their exports of manufactures competitive over a wider range of products. One of the principal problems in assessing the impact of LDCs (and shifts in comparative advantage) is that LDC import penetration (19) in manufactured goods markets is quite small. For eleven industrialised countries, LDC import penetration rose from 1.6 to 3.7 per cent from 1970 to 1980. Despite rapid growth, it is difficult to believe that a 2 percentage point ex post increase in market share is a major explanation for the secular decline in OECD manufacturing profitability in that decade -- although, as noted, ex ante competitive pressure is imperfectly measured by ex post market penetration. If LDC market penetration is normalized by the average of eleven other countries, there appears to be no systematic relation between relative penetration of domestic markets by LDCs and profitability. Thus, while rising competition from the LDCs is not inconsistent with observed profit trends, particularly in specific industries (steel, textiles, footwear, etc.), its quantitative importance does not appear to be enormous (Table 18) (20).

c) International relative unit labour costs

105. The trend in a country's unit labour costs relative to that of its competitors can be expected to have a significant effect on profitability in the tradeable goods sector. Such movements can in principle explain profit trends in a single country but not, of course, any global decline in profits. Changes in relative unit labour costs measured in a common currency capture two effects. The first is changes in domestic unit labour costs relative to those of competitors, which would be a sufficient measure if purchasing power parity held at all times. However, as this is not the case, the relevant variable for output prices and profits must be measured in a common currency in order to capture concurrent changes in exchange rates. Given the limitations of ex post penetration ratios, a cost-based indicator is in many ways preferable for assessing profit trends. International competitiveness can be expected to be relevant because when domestic costs exceed those of competitors not all the excess will be passed on into prices for fear of losing market shares. Hence profitability will take a part of the adjustment. Previous regression analyses suggest that international competitiveness has a substantial and significant effect on profitability in manufacturing (21).

Table 18

MANUFACTURING IMPORT PENETRATION RATIO FROM DEVELOPING COUNTRIES

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	Growth in % 1970-77	Growth in % 1970-80
United States	1.3	1.4	1.5	1.8	2.6	2.2	2.7	2.9	3.3	3.5	3.6	12.1	10.7
Japan	1.3	1.2	1.3	1.8	2.4	1.9	2.1	2.0	2.0	2.5	2.4	6.3	6.3
Germany	2.3	2.3	2.5	2.9	3.1	3.3	3.9	4.3	4.5	5.1	5.0	9.4	8.1
France	0.7	0.8	0.9	1.0	1.2	1.3	1.4	1.6	1.6	2.3	2.6	12.5	14.0
United Kingdom	2.0	2.2	2.3	3.4	3.6	3.4	3.5	3.5	4.1	4.8	4.3	8.3	8.0
Italy	1.9	1.8	2.2	3.2	3.0	2.7	3.2	3.7	4.0	5.6	5.7	10.0	11.6
Canada	1.4	1.4	1.6	1.7	2.0	1.8	2.1	2.1	2.0	2.2	2.1	6.0	4.1
Australia	2.2	2.4	2.5	3.1	4.8	3.8	4.9	5.6	5.3	5.9	5.8	14.3	10.2
Belgium	5.6	3.9	3.8	5.2	5.7	4.3	4.9	4.2	4.1	4.4	4.6	-4.0	-1.9
Netherlands	4.3	4.4	4.5	6.0	5.6	5.9	7.5	7.5	7.7	9.2	9.4	8.3	8.1
Sweden	2.9	2.7	3.0	3.2	3.6	3.0	3.6	3.7	3.1	4.2	3.9	3.5	3.0
Total of 11 countries	1.6	1.6	1.8	2.2	2.8	2.4	2.9	3.0	3.2	3.7	3.7	9.4	8.7
EEC	2.2	2.2	2.4	3.1	3.2	3.1	3.6	3.8	4.1	4.9	4.6	8.1	7.7

Source: OECD Statistics of Foreign Trade, Series C.

106. Preliminary Secretariat regression estimates suggest that for the manufacturing sector of ten countries, gross profit rates are strongly associated with relative unit labour costs and capacity utilisation (22). Cross-country differences in the cyclical sensitivity of profits appear to be related to the degree of flexibility with which employment is adjusted to output, as well as wage flexibility. For example, the cyclical sensitivity of profits is relatively low in the United States, Japan and Germany but relatively high in France, Italy and especially Sweden.

107. In approximately half the countries, the secular decline in profit rates appears to be entirely explained by lower capacity utilisation and international competitiveness in the sense that there is no significant negative trend after these efects have been allowed for. However, a firm conclusion to this effect cannot be reached in the presence of strong collinearity in the explanatory variables. As the relative cost variable itself often has a trend, part of its "effect" could be spurious. In the other countries a significant negative time trend remains indicating the existence of other unknown factors.

108. In a number of countries profit rates are correlated with inflation but not in a consistent way; the correlation is negative in the United States, the United Kingdom, Germany and Italy but positive in France, Japan, Canada and the Nordic countries. This may be a spurious correlation or the net effect of differing pricing policies, the commodity composition of industry and the incidence of inter-sectoral terms-of-trade changes (Annex Table II.1). Indirect effects through the influence on activity of changes in the financial position of firms, arising from changes in inflation, may also figure.

iii) The behaviour of labour costs

109. Another, albeit partial, explanation for the behaviour of profits and rates of return may lie in direct influences on income shares. In the framework of either neo-classical or post-Keynesian models, autonomous changes in wages or a failure of real labour costs to adjust to productivity trends may affect the share of profits. Two hypotheses are considered covering the movement of wage costs: a) non-wage labour costs; b) conflict theories. Lastly some evidence reflecting on both is reviewed in the context of factor substitution including energy inputs.

a) Non-wage labour costs (NWLCs)

110. The hypothesis considered is that the sharply rising proportion of NWLCs (including social security taxes) in total taxation and in labour costs may have been a main factor influencing the slowdown in profits and rates of return. Increases are observed from 1955 on, becoming more marked in the 1970s (Table 19). This hypothesis requires some elaboration, as the effect of any tax, wherever levied, on factor income distribution depends on complex interactions of a general equilibrium kind. Higher labour taxation will affect money wages, producers' prices or profit margins or some mix of the three. The clearest case of "neutral tax incidence" is when NWLCs are a direct substitute for money wage increases; including benefits in kind or deferred income (e.g. health care, holidays, reduced working time, improved private pensions, etc.). Higher NWLCs could be regarded as part of the supply price of labour or the social wage when shifted fully backwards into money

Table 19

NON-WAGE LABOUR COSTS
(per cent)

	Proportion of NWLCs in total compensation			Social security contributions as a share of total tax receipts				
	1960-1973	1974-1982	1982 estimate	1955	1965	1975	1980	1982
United States	10	14	15.3	11.0	16.4	24.5	26.1	27.7
Japan	8	11	12.4	12.7	21.8	29.0	29.1	30.4
Germany	14	18	18.6	24.5	26.8	34.1	34.4	36.2
France	24	27	27.8	-	34.2	40.8	42.7	43.2
United Kingdom	9	13	13.5	10.4	15.4	17.4	16.9	16.9
Italy	26	26	24.2	32.1	34.2	45.9	36.6	47.2
Canada	6	10	10.8 (a)	4.2	5.7	10.1	10.4	11.3
Finland	14	18	18.1	7.9	2.9	8.3	8.2	8.4
Netherlands	19	22	22.5	16.1	30.6	38.4	38.1	41.6
Spain	14	18	20.8	-	28.3	47.5	48.6	46.5
Sweden	13	25	28.2	2.1	12.1	19.5	28.6	27.9
Switzerland	12	14	15.5	21.5	22.5	29.2	30.9	31.0

Source: OECD National Accounts, Long-Term Trends in Tax Revenues of OECD Member Countries 1955-1980 and Revenue Statistics of OECD Member Countries 1965-1983, Table 15.

a. 1981.

Table 20

NUMBER OF WORKING DAYS LOST PER 1,000 PEOPLE EMPLOYED

	1972-76	1977	1978	1979	1980	1981
United States	396	389	384	352	335	246
Japan	118	28	25	17	18	10
Germany	18	1	173	19	5	2
France	252	174	104	173	79	73
United Kingdom	452	414	382	1190	491	185
Italy	1187	830	508	1357	800	509
Canada	1010	343	741	756	842	812
Austria	12	0	3	0	5	1
Spain	283	1339	955	1598	n.a.	n.a.
Sweden	23	21	9	7	1058	50
Switzerland	2	2	2	1	2	0

Source: ILO, Year Book of Labour Statistics.

wages (23). If NWLCs are not shifted fully backwards the firm will attempt to shift them forward into selling prices. Forward shifting may cause few problems when economic conditions are buoyant and inflation low, but could be difficult if macroeconomic conditions are depressed and government policy is concerned about inflation. Generally, shifting NWLCs forward may meet with domestic and foreign competition, or with restrictive macroeconomic policies, either leading to lower capacity utilisation rates. Profits then ultimately bear part of the tax burden.

111. It is possible that the disproportionately rapid rise in NWLCs, related to slow growth and the cyclical depth of recessions in the 1970s, has not been shifted fully backwards, ultimately leading to a squeeze on profits. Two aspects of this hypothesis are worth noting: the structure of NWLCs and the likely shifting of specific NWLC elements.

-- The structure of NWLCs

112. The reasons for the rapid rise in NWLCs are complex (Table 19). In part, they appear to be cyclical; in part they are related to the slow adjustment of social welfare commitments in an era of lower growth; and in most countries some part of the pressure is demographic. First, NWLCs have a surprisingly large cyclical component; social expenditures are related not only to payments of the dole, but also to accelerated earlier retirement, disability pensions and training schemes, all responses to unemployment. Another, perhaps structural, factor is that welfare entitlements were established on the basis of optimistic assumptions regarding actual and potential growth rates in the 1970s and were in many cases linked to rising personal incomes and extended eligibility criteria. Where such programmes are fully-funded or based on earmarked tax sources, social security deficits have resulted in quasi-automatic general rises in statutory tax rates. To compound what appears to be a structural problem, shifts in demographic patterns towards an ageing population and a smaller actively-aged population have put and are likely to put yet more pressure on future social security tax rates.

-- Tax incidence

113. There is no consensus concerning the degree of backward shifting in the academic literature. Nonetheless, the North American literature (as well as opinions expressed by trade-union and business representatives) suggests that tax structure may be influential in determining incidence. A key distinction is made between statutory (or exogenously imposed) elements and those which are negotiated (endogenously) by the social partners as part of the wage contract. The latter (including improved working conditions, hours, pensions, etc.) are more likely to be accepted as part of the pay packet and hence shifted back to wages. By contrast, labour's perceptions concerning externally-imposed tax increases are ambiguous. This is hardly surprising as assessments of tax versus expected benefits encounter complex inter-group, inter-generation income transfers. Hypotheses concerning tax incidence are difficult to test. Nonetheless, it is worth noting that there was a consensus in the OECD Joint Labour-Management Committee regarding the likely incidence of statutory versus collectively-negotiated NWLCs (24).

114. While not perhaps a dominant factor, the rise in NWLCs may have had non-negligible effects on profits, particularly in the past decade. However, a simple scatter diagram between changes in the proportion of NWLCs in total

compensation and social security contributions in tax receipts reveals no visible cross-country correlation between these and profit performance.

b) Conflict theories: market power or the struggle for income shares

115. One explanation for the secular drop in profits is a shift in labour supply or market power as a result of two decades of high employment expectations. If this hypothesis were valid, secular trends in profitability or an ordinal ranking of profitability between countries could be proxied by some quantitative measure of "labour power". However, no satisfactory a priori measure of the concept suggests itself. The two most commonly used measures are strike activity and trade union membership. Both are fraught with conceptual and statistical problems. Research in this domain has been inconclusive.

-- Strike activity

116. Data for work stoppages and days lost in industrial disputes are collected regularly by the ILO (Table 20). A number of researchers have used this measure as a proxy for social consensus, even though it is widely recognised as inadequate. First, the exercise of labour power need not necessarily result in strikes: the risk of a strike or work-to-rule may be equally potent methods of exercising power. Second, there are wide differences in recording practices, partly because the definition of what constitutes a strike may vary over time and between countries (some countries record only official and exclude wild-cat strikes). Similarly the number of hours lost per 1000 workers in industrial disputes may be less representative of the degree of social consensus than say the frequency, length and/or breadth of strike activity. Finally, a country ranking of strike activity on ILO standardized definitions yields a weak correlation with absolute profit rates and shares. For example, Canada, Finland and Italy regularly top the international league for strike activity, although their profit shares in manufacturing in the 1970s appear to have been among the better maintained of the countries surveyed in this paper. Similarly the United Kingdom is about average in terms of incidence of industrial conflict but the worst in terms of profit performance. By contrast, strike data for Japan and Germany could be interpreted as supporting the hypothesis that social consensus is favourable to profit performance.

-- Trade union membership

117. A more commonly used proxy for "labour power" is trade union membership as a proportion of the work force. This concept faces even more statistical and conceptual difficulties than the first. First, it is surprisingly difficult to obtain information concerning union membership at any point in time, let alone time-series data. In most countries unions are the sole source of information and there are few official government estimates. Second, there is a degree of ambiguity concerning what constitutes a "union". For example, workers co-operatives, company unions and associations may be excluded from union membership coverage depending upon institutional practices. Third, at a conceptual level, a critical institutional factor is the structure of the trade union movement. A highly centralised cohesive movement (as in Scandinavia) may have different effects on income distribution compared with an organisation fragmented by political and religious

affiliations (e.g. France). Similarly, union goals may differ sharply depending on their constituencies; an example being blue-collar versus white-collar unions. Finally, some countries may have very high (or low) trade union density as a result of social or institutional reasons or the particular history of the trade union movement. Hence, these ratios might bear little relation to "labour power" or shifts over time. For all of these reasons a simple comparison of the proportion of trade union membership (Table 21) over time or between countries may be misleading in terms of gauging "labour power" (25).

118. A scatter diagram of trade union membership and profit rates for a number of countries (Chart D) appears to indicate a negative, albeit loose, relationship between the degree of trade union membership and rates of return on capital stock. This would be consistent with the avowed goals of trade unions to increase the real wages of their membership. As regards individual country experience, the rate of return in Japan and Belgium is somewhat higher and that of the United Kingdom and Norway lower than indicated by other countries with comparable trade union membership; while a number of countries are surprisingly close to common experience. Ideally, one would prefer comparable trade union membership data over time, to test the relevance of this factor in profit developments. If such a relation could be isolated, this would raise difficult policy issues. For example, if a recovery in profits is judged to be critical for growth and employment, does this imply that limitations on union rights and activities are necessary? On the other hand, an understanding of the consequence of wage-push on profitability might be beneficial. For instance, this might result in greater emphasis on worker participation in profit sharing, as well as promoting a social consensus concerning the structure of investment and the introduction of technical change.

iv) Factor substitution: wage-push and energy prices

119. The hypothesis that wage-push was behind the decline in profits and profitability may be considered more directly by examining the behaviour of labour shares rather than the behaviour of a proxy for labour strength, (which if it worked well would in any case be reflected by labour shares, at least ex ante), and by looking for the responses to this behaviour which could a priori be expected to follow. In this context the notion of wage push can be extended to the case of a full-employment growth path where the supply of labour is relatively inelastic compared to the supply of capital. The relative price of labour would then tend to rise without any institutional monopoly power being exercised by labour.

120. Increasing real and relative labour costs can be expected to lead to a substitution of capital for labour in new processes and earlier scrapping of old processes which become uneconomic more quickly. Both tend to raise the growth of labour productivity, although the average degree of capacity utilisation will also affect the trend.

121. The growth of employment, capital stock and total factor input is shown in Table 22. Movements in labour, capital and total factor productivity are shown in Table 23 and Chart E. Trends in capital productivity were noted in Part III. Labour productivity is probably less susceptible to errors of measurement than capital productivity, although numbers employed are not adjusted for the secular decline in hours worked, except in the manufacturing

Table 21

TRADE UNION MEMBERSHIP AS PROPORTION OF LABOUR FORCE

(Percentages)

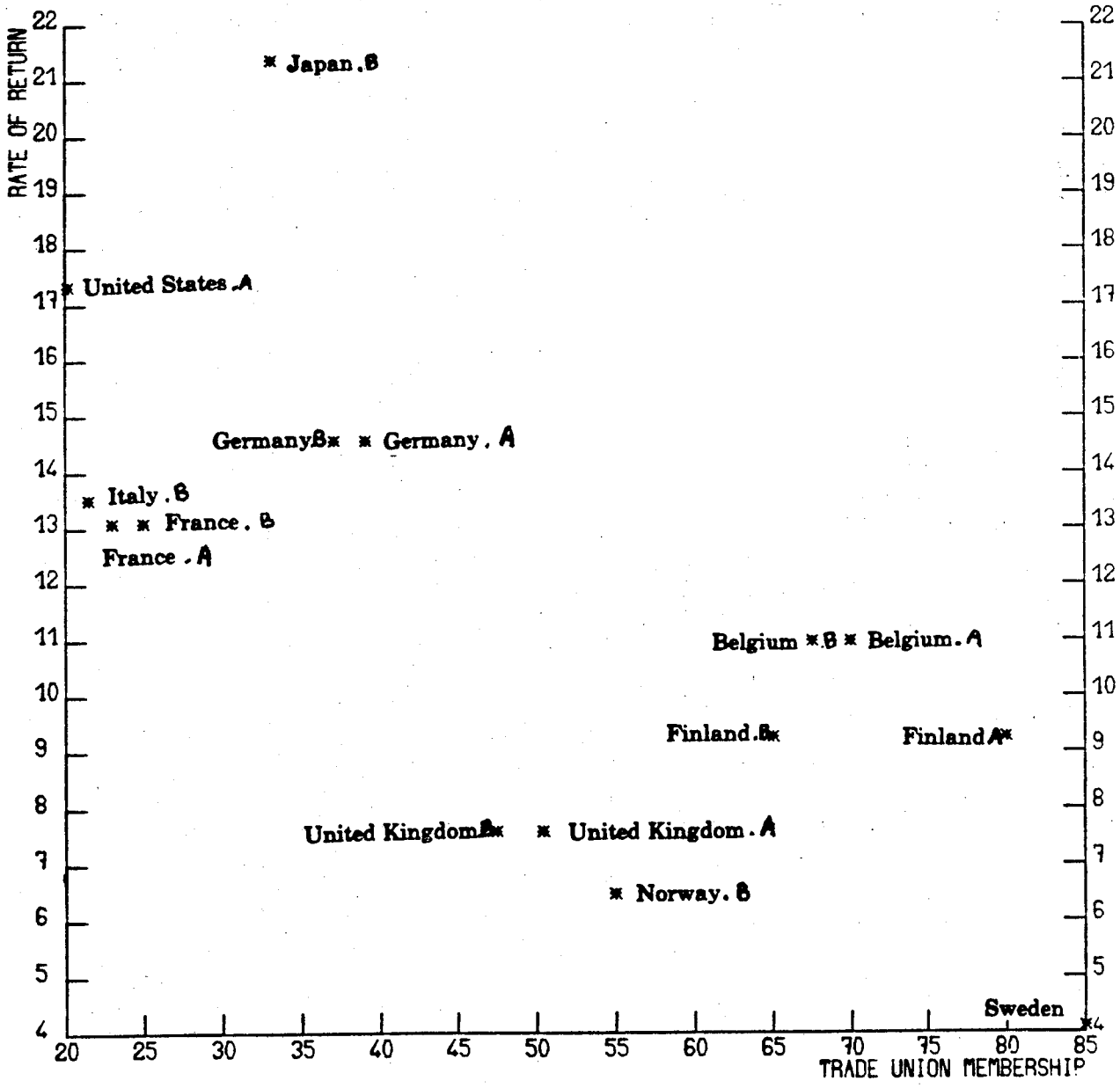
	European Federation of Trade Unions	Der Spiegel 1976	Union density Recent figures published by the organisations
United States			24.5 (a)
Japan			33
Germany	34-40	39	39
France	25	23	23
United Kingdom	45-50	43	50.4
Italy			22
Austria	58	58	60
Belgium	65-70	70	70
Denmark	60	70	70
Finland	65	55	80
Iceland	60		
Ireland	75		
Luxembourg	40	55	55
Netherlands	35	40	40
Norway	55	50	
Sweden	85	85	
Switzerland	25-30	37	38-40
Australia		50	50
New Zealand			55

Source: Von Beyme, 1980, pp.75-76.

a. Non-agricultural workers.

Chart D

TRADE UNION MEMBERSHIP AND RATE OF RETURN



Note: A = Estimates for 1976 by "Der Spiegel".
B = EFTU estimates, various years.

Table 22

EMPLOYMENT, CAPITAL STOCK AND TOTAL FACTOR INPUT

(Compound growth rates)

	Total business						Manufacturing					
	Labour		Capital		Total factor		Labour		Capital		Total factor	
	I	II	I	II	I	II	I	II	I	II	I	II
United States	2.1	2.1	3.7	3.6	4.1	2.4	1.2	-0.5	2.9	3.5	5.4	1.3
Japan	..	..	..	..	..	..	2.2	-0.4	12.9 (a)	5.9	13.5 (a)	6.3
Germany	0.7	-0.4	6.5	3.9 (h)	5.3	2.8 (h)	-0.5	-2.5	7.0	2.2	5.6	1.5
France	..	..	5.5 (k)	4.8 (h)	7.5 (c)	4.0 (j)	0.8	-2.1	5.5	4.4	8.3	2.0
United Kingdom	-0.5 (c)	-0.9 (1)	3.2	2.8	1.5	3.3	-1.5	-3.6	3.4	2.0	2.2 (b)	-0.6
Italy	..	..	..	..	..	..	-0.1	-0.9	4.9 (e)	2.8	7.0 (a)	3.5
Canada	3.1 (b)	2.7 (1)	5.0	5.3 (1)	6.3 (c)	3.8	1.6	-0.5	4.8	4.0	6.6 (c)	0.2
Belgium	0.3 (d)	-1.5	5.5	3.1	5.1 (d)	2.7	-0.2	-4.3	6.0	0.3	8.4 (d)	1.4
Finland	2.2	0.4	6.5 (d)	4.7 (j)	5.7	2.9	..	..	6.7	3.2	6.8	3.6
Norway	..	..	..	..	..	..	0.4	-1.8	5.6 (e)	4.9	5.8 (e)	0.7
Sweden	0.5 (e)	-0.1	4.6 (e)	3.7 (h)	3.8 (f)	1.7	-1.3	-2.1	4.7 (f)	3.7	5.3	0.3

Source: OECD National Accounts and capital stock files.

Notes: I = 1960-1972 or earliest available data.
II = 1972-1981 or latest available date in total business sector; 1972-1982 in manufacturing.

a. 1965-72. b. 1966-72. c. 1961-72. d. 1970-72. e. 1962-72. f. 1963-72.
g. 1971-72. h. 1972-80. i. 1967-72. j. 1972-79. k. 1964-72. l. 1972-82.

Table 23

LABOUR, CAPITAL AND TOTAL FACTOR PRODUCTIVITY
(Compound growth rates)

	Total business						Manufacturing					
	Labour		Capital		Total factor		Labour		Capital		Total factor	
	I	II	I	II	I	II	I	II	I	II	I	II
United States	2.0	0.3	0.4	-1.2	1.5	-0.1	4.1	1.8	2.4	-2.2	3.7	0.8
Japan	..	..	..	..	..	..	11.8 (a)	6.7	0.5 (a)	0.4	7.5 (a)	3.7
Germany	4.6	3.2 (h)	-1.1	-1.0 (h)	2.6	1.5 (h)	6.2	4.1	-1.2	-0.7	4.2	2.6
France	..	..	2.2 (i)	-0.9 (j)	..	..	8.3	4.2	2.6	-2.3	6.2	2.2
United Kingdom	2.0 (c)	4.0	-1.6	0.5	1.3 (c)	2.2	-0.5 (b)	3.1	4.8 (b)	-2.6	3.4 (b)	1.6
Italy	..	..	..	..	..	..	5.7 (d)	4.4	-2.4 (d)	0.7	2.9 (d)	3.2
Canada	2.5 (b)	2.9	1.2 (c)	-1.4	1.7 (b)	-0.3	4.7 (c)	0.7	1.6 (c)	-3.8	3.8 (c)	-0.6
Belgium	4.7 (d)	4.2	0.0 (d)	-0.5	2.4 (d)	2.1	11.1 (d)	6.0	4.8 (d)	1.1	10.9 (d)	4.6
Finland	4.2	2.6	-0.5 (d)	-2.0 (j)	2.2 (d)	0.9 (j)	..	..	5.0 (g)	0.4	..	..
Norway	..	..	..	..	..	..	5.5 (e)	2.6	0.2 (e)	-4.0	4.5 (e)	0.6
Sweden	3.5 (f)	1.9	-0.7 (f)	-1.6 (h)	2.4 (f)	1.0 (h)	6.7	2.5	0.1 (f)	-3.2	5.3 (f)	0.9

Source: OECD National Accounts and capital stock files.

Notes: I = 1960-1972 or earliest available data.
II = 1972-1981 or latest available date in total business sector; 1972-1982 in manufacturing.

a. 1965-72. b. 1966-72. c. 1961-72. d. 1970-72. e. 1962-72.
f. 1963-72. g. 1971-72. h. 1972-80. i. 1967-72. j. 1972-79.

sector where the data permit it. The picture is also more uniform over time across countries and across sectors. Comparatively strong rates of increase were evident throughout both periods in all countries (except the United Kingdom where a marginal decline was recorded in the earlier period). Growth is particularly marked in the manufacturing sector. However, a deceleration after 1972 is noticeable in many countries, which becomes more widespread on moving from total business to the manufacturing sector. Rates and levels, on the other hand, generally remain higher in manufacturing.

122. It is noteworthy that these tendencies appear to be general. Although there were important differences between economic performance in North America and Europe, particularly with regard to employment generation, the trend change in labour productivity was common. However, the deceleration in labour productivity occurred from much higher rates of growth in Europe and rates remained positive and significant; the observed growth in labour productivity in the United States in the later period is barely positive in the total business sector. The United States and Canada also showed the lowest growth rates of labour productivity in manufacturing throughout both periods.

123. Total factor productivity was estimated by dividing an index of output by an index of inputs, where labour and capital inputs are weighted by their shares in factor income. In North America, the combined effect of low growth in labour productivity and negative growth in capital productivity yielded small negative growth in total factor productivity after 1973, at least in the total business sector. In Canada, total factor productivity also fell slightly in the manufacturing sector. The contrast with Europe is striking. Although most European countries showed decelerating growth rates in total factor productivity in the later period, it generally held up relatively well. The United Kingdom provided one exception: the growth rate in the total business sector, due to North Sea oil, rose after 1973.

124. Because the period 1972-1982 moves from, roughly, a cyclical peak to a cyclical trough, Tables 22 and 23 were recalculated for the periods 1960 to 1975 and 1975 to 1982 (approximately trough to trough). The tenor of the results did not change markedly (26).

125. The growth of labour productivity through the 1960s appears to be closely associated with continuing growth in total real labour costs in a situation where labour was somewhat supply-constrained. Continual substitution took place. Any decline in profit shares during this period can credibly be ascribed to a rise in the relative cost of labour while substitution possibilities were not great enough to compensate fully. However, there is little sign of an acceleration in labour productivity in the 1960s; if anything the trend showed signs of weakening roughly in line with capital productivity. At the end of the 1960s or early in the 1970s the trend of labour productivity growth turned downwards fairly clearly and generally. In the United States the decline seems to date from the late 1960s -- roughly the same period as the decline in the profit share -- elsewhere it coincided with the first oil-price shock.

126. Capacity utilisation series running from the 1950s are available only for the United States. There capacity utilisation was indeed higher in the 1960s than the 1950s, but it peaked in 1966 before the profit decline began. Unemployment hit its record low in 1968. The subsequent decline of labour productivity growth in the 1970s in almost all countries is influenced by

Chart E

LABOUR, CAPITAL AND TOTAL PRODUCTIVITY IN TOTAL BUSINESS SECTOR

Index 1975=100

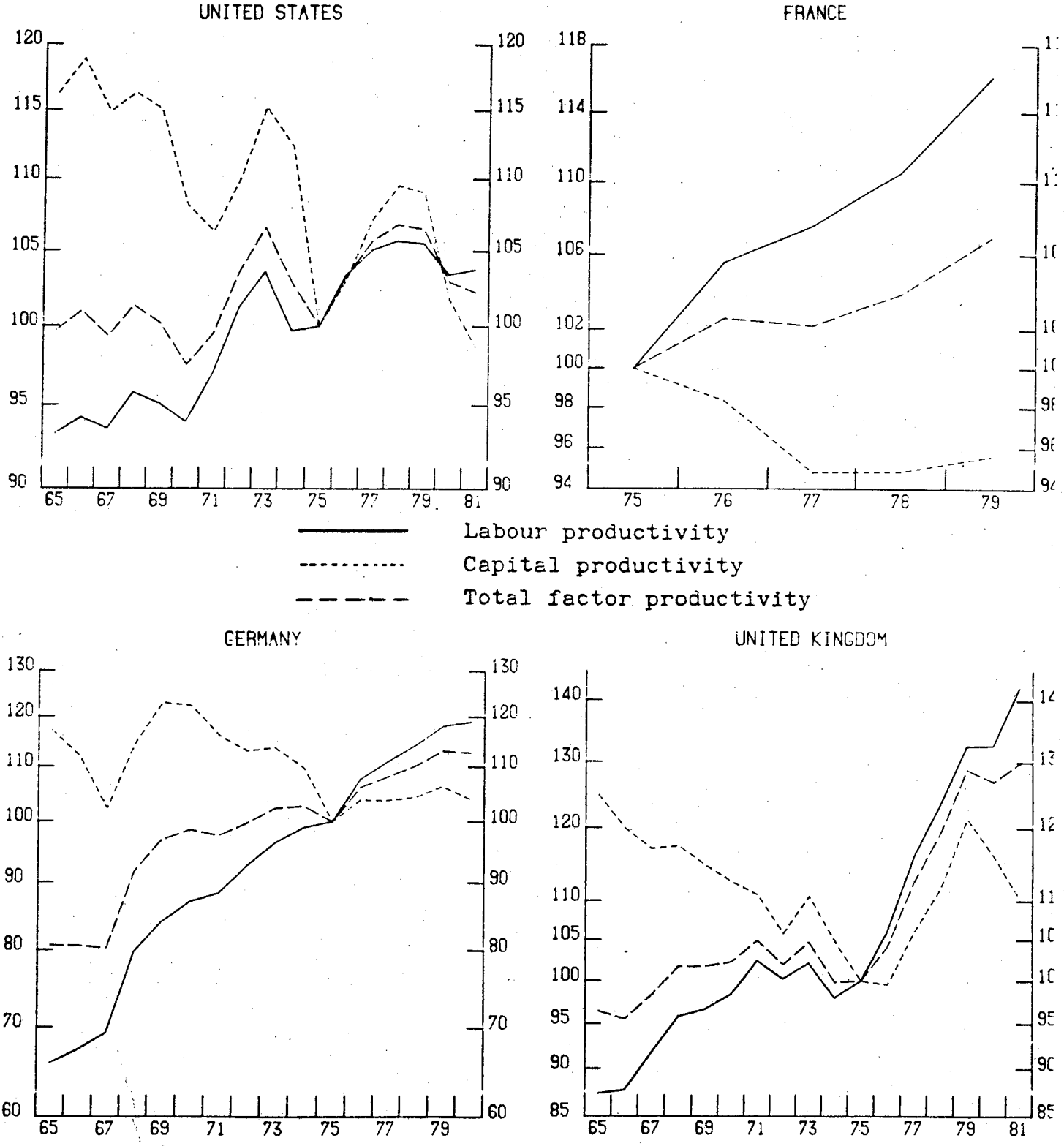
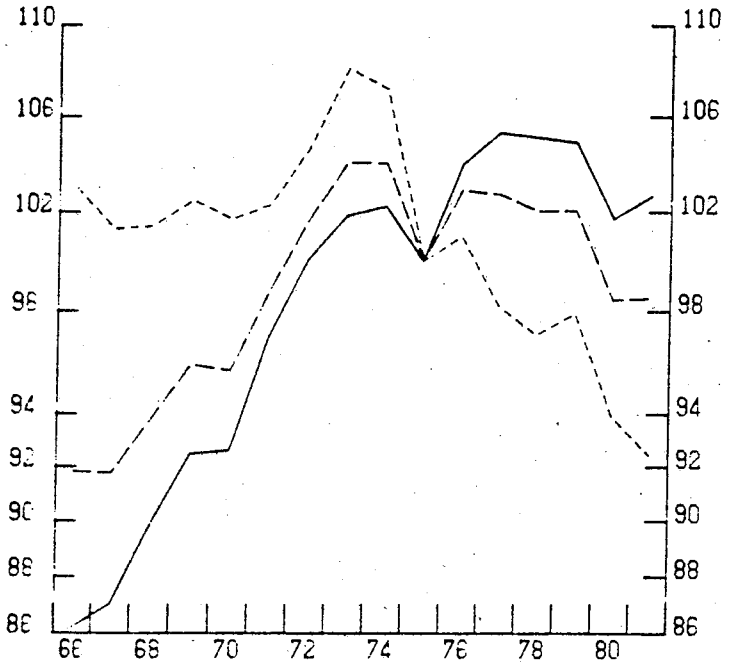


Chart E continued

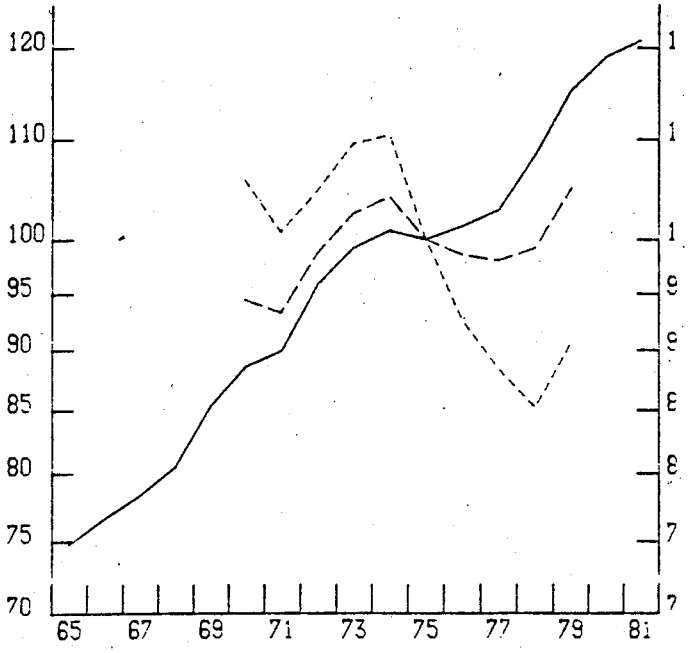
LABOUR, CAPITAL AND TOTAL PRODUCTIVITY
IN TOTAL BUSINESS SECTOR

Index 1975=100

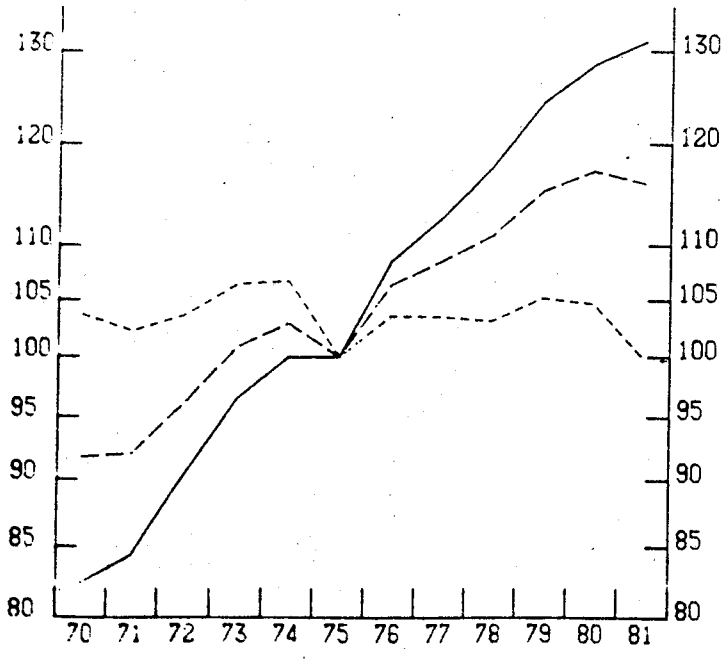
CANADA



FINLAND



BELGIUM



SWEDEN

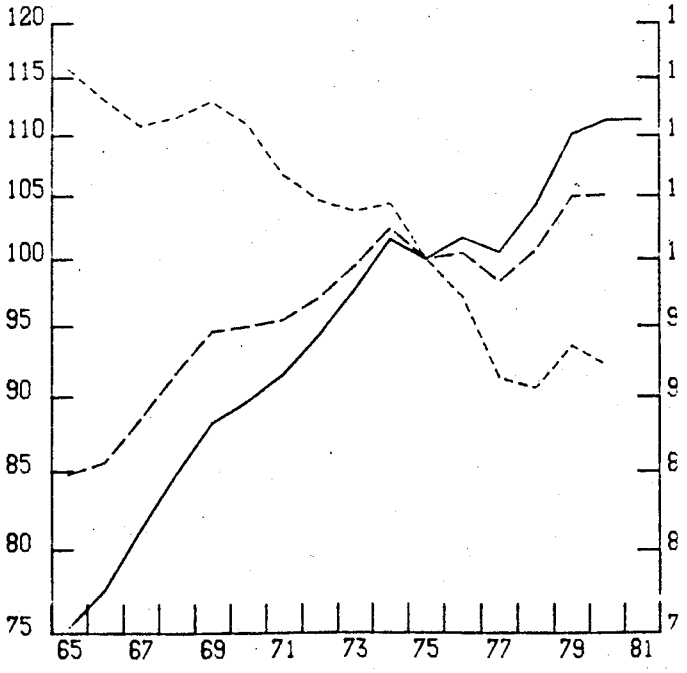


Chart E continued

LABOUR, CAPITAL AND TOTAL PRODUCTIVITY
IN MANUFACTURING

Index 1975=100

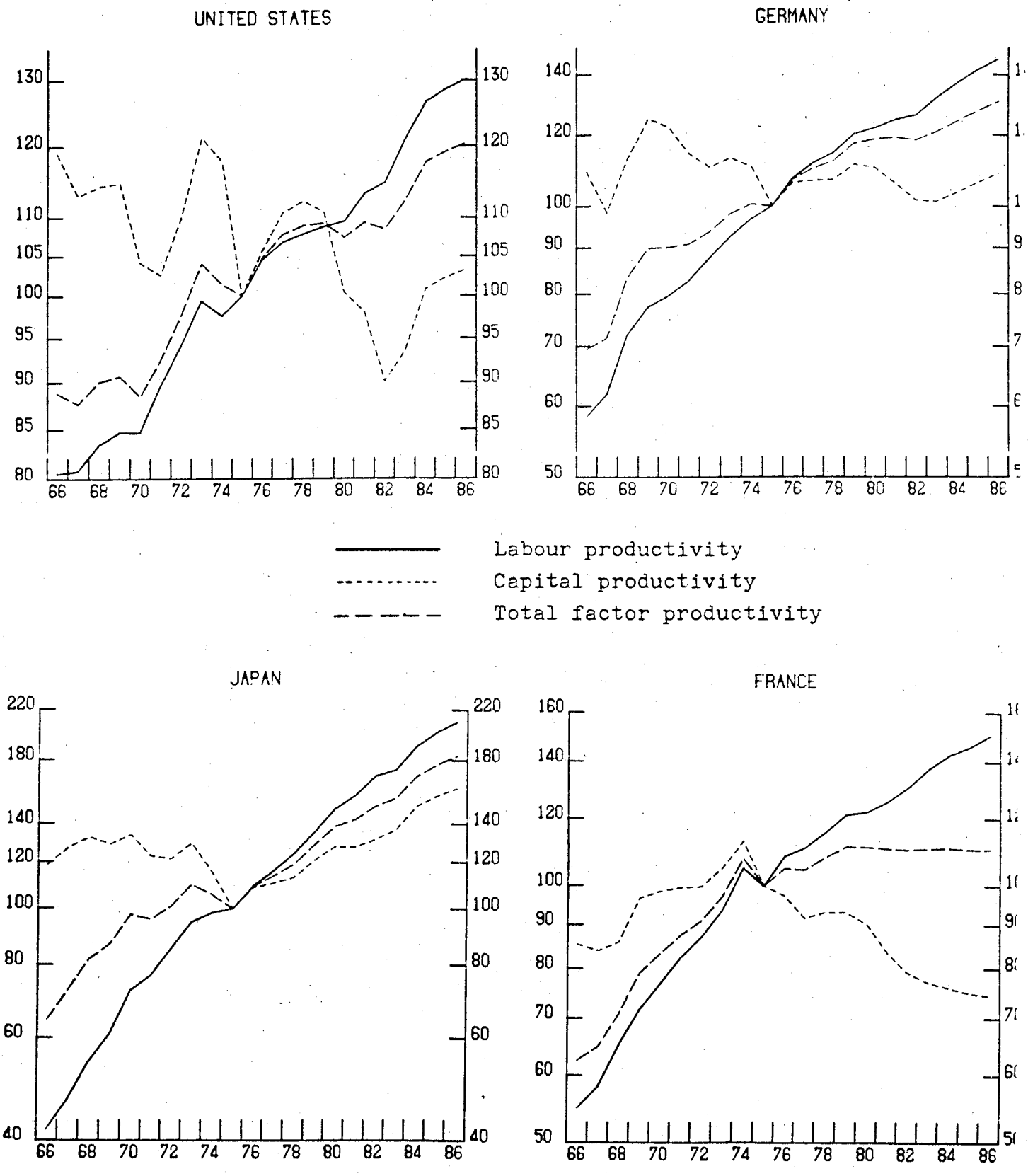


Chart E continued

LABOUR, CAPITAL AND TOTAL PRODUCTIVITY IN MANUFACTURING

Index 1975=100

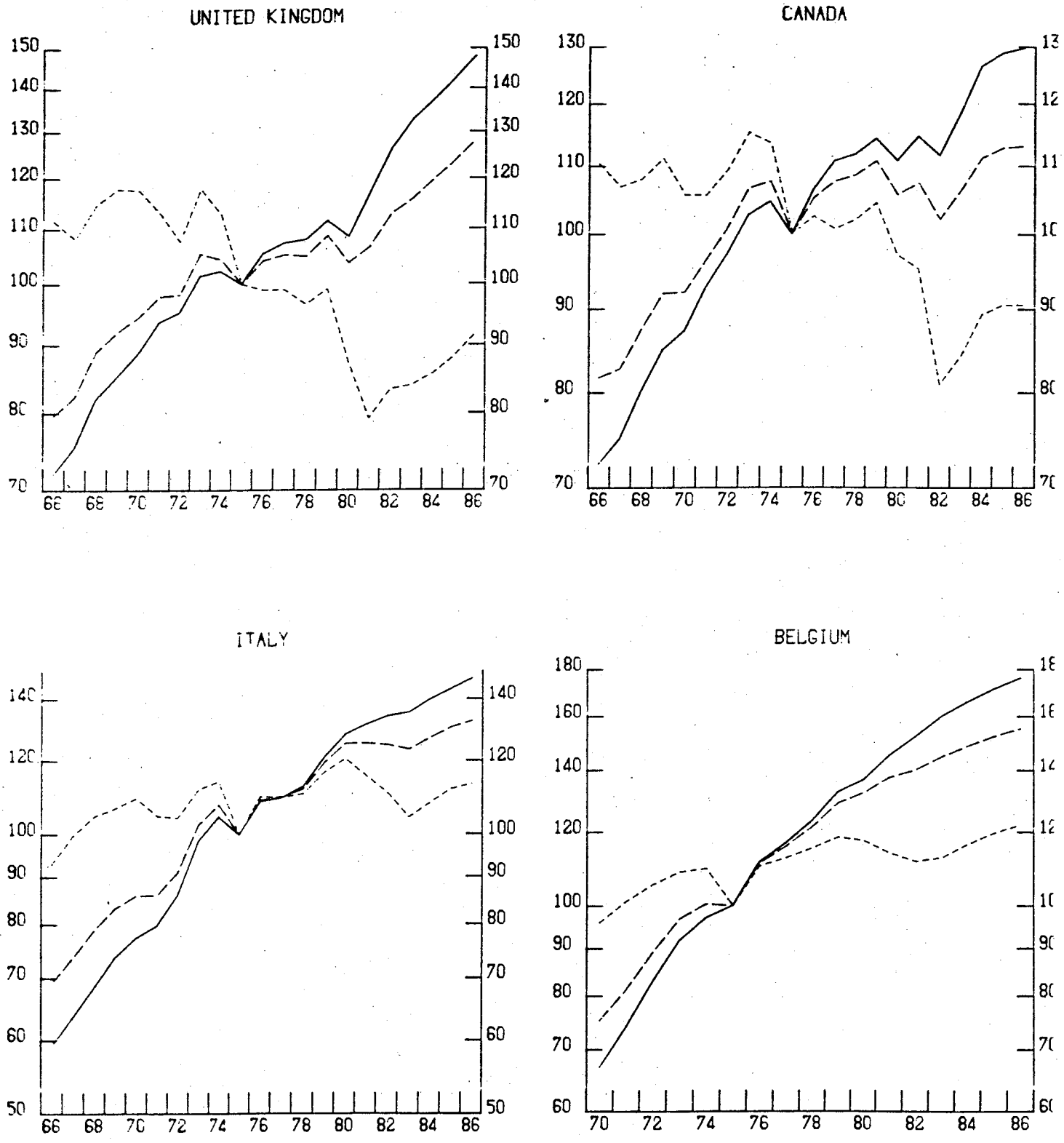
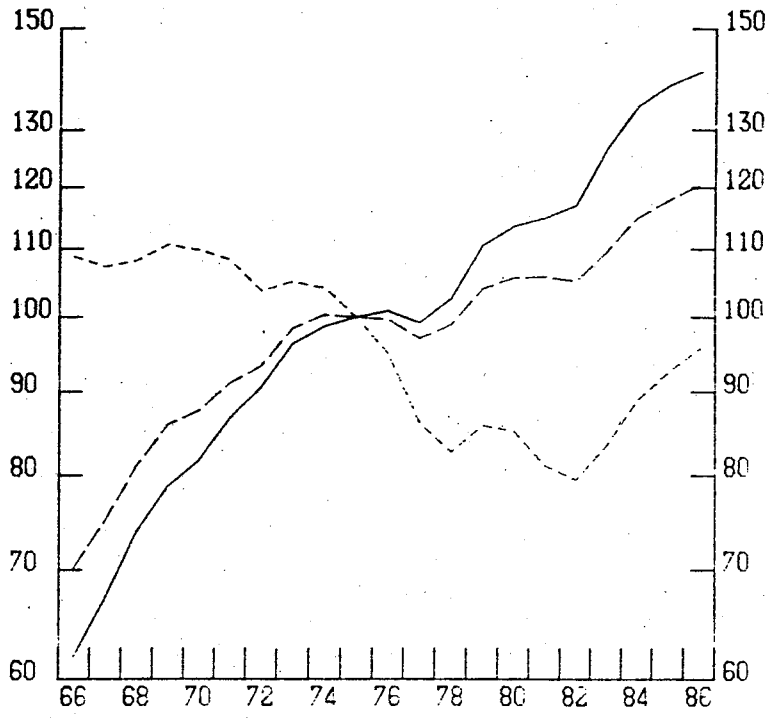


Chart E continued

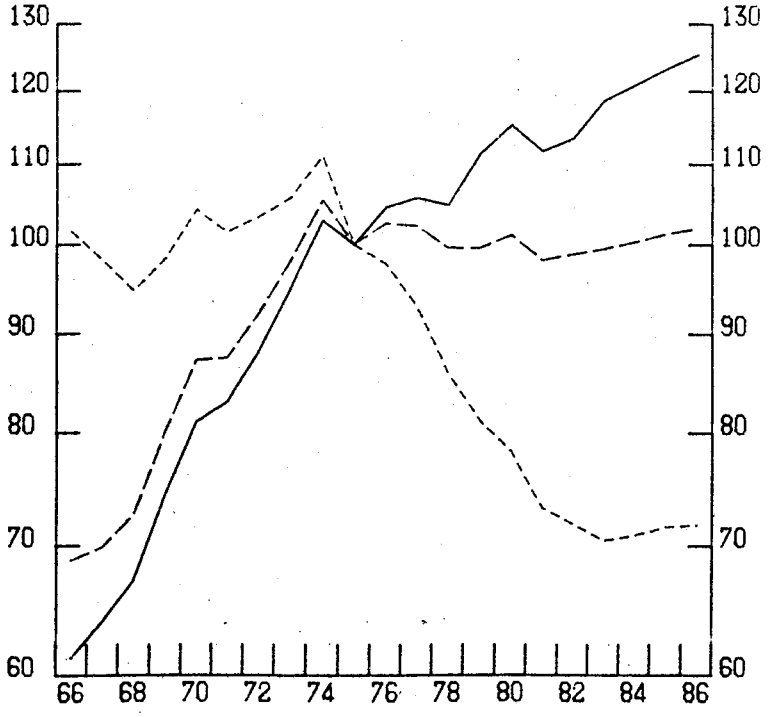
LABOUR, CAPITAL AND TOTAL PRODUCTIVITY IN MANUFACTURING

Index 1975=100

SWEDEN



NORWAY



lower levels of capacity utilisation and probably also by substantially lower output growth.

127. Two points stand out: first, the profit decline in the second decade considered is associated with a movement away from full capacity not with persistent full employment strengthening labour power. Second, the change in labour productivity growth is in the wrong direction for an intensified wage-push explanation to be plausible. When capital productivity decelerated, labour productivity did so too. A necessary component of any explanation which fits the 1970s, therefore, is a reason for the decline in total factor productivity. Accelerated substitution between capital and labour does not fit the facts. The facts are better explained by a failure of wage growth to adjust downwards to lower productivity occurring for some other reason. On this basis, wage behaviour is important, particularly in the early period, but is secondary in the later one. The primary factor then appears to be capital productivity. One important possibility is the more intensive use of both capital and labour in order to economise on newly-expensive energy inputs (see Table 24). Indeed the clustering of events in the 1970s makes this seem irresistibly likely. The difficulty is to know how important it was quantitatively and what the prospects are now that the OECD seems likely to face a period of reasonably stable real energy prices. The observed fact remains that the decline especially in profit rates did not begin in the 1970s.

128. While additional factors can be sought and easily present themselves for the decline seen then, these factors are unlikely to account for the whole decline in the later period given that there were already other influences at work. To this extent the question as to the determinants of the decline in profit shares and rates of return remains open.

Table 24

DECLINE IN ENERGY INTENSITY (a)

	1973-78	1978-82	1973-82
Industry			
United States	-17.4	-23.4	-36.8
Japan	-27.4	-16.3	-39.2
Germany	-24.2	-24.8	-43.0
France	-12.7	-23.7	-33.4
United Kingdom	-1.6	-7.9	-9.3
Italy	-20.6	-22.5	-38.5
Canada	-22.4	-29.5	-45.3
Total	-21.1	-24.9	-40.7
Transport			
United States	-0.01	-18.6	-18.6
Japan	3.0	-7.0	-4.1
Germany	-1.4	-2.8	-4.2
France	-1.2	-2.1	-3.2
United Kingdom	-1.0	-16.1	-17.0
Italy	0.5	1.3	1.8
Canada	-6.5	-23.6	-28.5
Total	-3.7	-18.3	-21.4

a. Change in index of final energy demand divided by change in index of real GDP.

Source: OECD National Accounts and IEA Energy Balances.

NOTES AND REFERENCES

1. See T.P Hill (1979), Chapters 4 and 5, for a detailed explanation of the operating surplus as defined in the United Nations System of National Accounts.

2. In Canada, for example, the inclusion of working capital in the denominator offsets more than one-half of the observed trend decline in the rate of return on reproducible assets in the 1970s. This largely reflects the more efficient use of cash balances.

3. See Feldstein and Summers, 1977; Nordhaus, 1974.

4. For most countries, the bulk of corporate tax liabilities are incurred in the concurrent and immediately previous years. However, a few countries have effects dating three to five years back. An analysis of the relationship between current year corporate and income tax collections and the years in which this income was earned is presented in "Income Tax Collection Lags", OECD Studies in Taxation, Paris 1983.

5. There were changes in taxation on inventory appreciation to improve cash-flow [e.g. United Kingdom (1981), United States (1981-82), Netherlands (1981) -- Australia (1978) and Canada (1979) had acted earlier]; increases in investment premia or depreciation allowances [e.g. United States and Germany (1982)]; cuts in corporation tax (United Kingdom, Canada, Netherlands and Spain); or shifts in social security taxes from firms to households (Belgium).

6. See Flemming, et.al., 1976; Wassell, 1983.

7. Modigliani, F., and Miller, M., 1958.

8. Feldstein (1980) shows how the interaction of the tax structure and inflation expectations can reduce equilibrium share prices, taking into account both institutional and household holders of financial assets, and the range of different tax rates affecting each. A permanent increase in the expected rate of inflation reduces the demand for shares because the real net yield after tax on equities falls while, under reasonable assumptions about the tax and financial variables involved, that on alternative investments does not.

9. Expected profitability = F/K and the cost of capital = F/V. The ratio of expected profitability to the cost of capital = V/K, i.e. the valuation ratio.

10. Obvious examples in this respect are the primary commodity boom of 1972, two successive oil price shocks, high inflation and the breakdown of the fixed exchange-rate system. In a few countries, the adoption of wage and price controls may also have been contributing factors to a squeeze on profits.

11. The U.K. results illustrate the hazards of drawing conclusions on the basis of simple causality tests. There is evidence of a strong, stable cash-flow influence in the U.K. Treasury model when investment includes inventories and post-tax interest rates are added as an explanatory variable.

12. The number of patents issued and the proportion of R&D expenditure in GNP have dropped steadily since the 1960s in the United States. However, these are generally recognised as being imperfect indicators of the pace of innovation. For example, there has been a trend away from the application of costly patents in the corporate sector. Further, most of the decline in R&D expenditure in the United States is accounted for by the military and space sectors. By contrast, the proportion of R&D expenditure has risen in many other countries.

13. Nelson, 1983.

14. For example, government expenditure on R&D as a proportion of GDP in France, Germany, Japan and the United Kingdom was typically less than half that of the United States, where it accounted for 2.2 per cent of GDP in 1965. Since that time the proportion has dropped steadily in the United States and risen in other countries.

15. Helliwell et.al., 1984.

16. The productivity slowdown in the United States has been explained by an interesting, albeit controversial, social model based on Marxian class conflict theory by Weisskopf et.al., 1983. New proxies for work effort and the rate of innovation are developed, which "explain" the slowdown of U.S. productivity very well. However, the economic rationale for the inclusion of such social variables remains highly problematic, as is the interpolation of their empirical results.

17. Turner 1980a.

18. An often-cited example of heightened competition in the 1970s is the entry of the NICs into a number of traditional markets of the mature industrial economies (notably shoes, textiles, steel, chemicals and shipbuilding).

19. R import penetration is defined as:

$R = M_i/(P_i + M_I^W - X_I^W)$; where M_i: imports of country i from LDCs; P_i: production of country i; M_I^W: imports of country i from the world; X_I^W: exports of country i to the world.

20. By contrast, Beenstock (1983) argues that the de-industrialisation of the OECD manufacturing sector is a major factor explaining the fall in profit rates. First, although LDC market share is small, this ignores indirect and third market effects on OECD exporters. Second, de-industrialisation will have important effects on overall profits because manufacturing sectors are more capital intensive. Hence, any contraction in the manufacturing sector results in a fall in the marginal product of capital and a relative increase in that of labour.

21. See Turner 1980b. By contrast, Tarasofsky et.al. (1981) finds that international competitiveness in Canada had no significant influence on profitability, from 1950-1976. These differences probably reflect the earlier sample period, when shifts in Canadian competition positions were quite small.

22. In principle, the impact of competitiveness should be related to the degree of openness to foreign trade and the extent to which the country is a price-taker in world markets.

23. In some cases, union negotiations have emphasized fringe benefits rather than money wage increases. This might arise under conditions of wage/price controls or solidaristic union wage policies which squeeze money wage differentials. From the point of view of the firm, this is part of the implicit wage contract, whereby they guard employee loyalty and retain their best workers.

24. See Employment and Economic Consequences of NWLCs, OECD Joint Labour and Management Conference, 20th-22nd September 1982.

25. This is especially true where political considerations such as the relation between trade unions and socialist or conservative governments are allowed for.

26. The growth rate of labour productivity in the total business sector was generally higher in the period 1975-82 than in 1972-82, as would be expected, but, in contrast, rates were lower in manufacturing in a number of countries when the period was curtailed. The fall in capital productivity in the total business sector moderated in a number of countries (and reversed in Germany) when the shorter period was considered; but in manufacturing this effect was less evident, with France, Canada, Norway and Sweden actually recording sharper falls. Growth rates of total factor productivity improved in all countries in the total business sector; this was generally true of manufacturing also, although the rates for the United States and Canada did not change while that of France fell slightly when the calculation was made for 1975-82.

Annex I

EVALUATING AGGREGATE PROFITABILITY DATA

A. CONCEPTUAL AND MEASUREMENT ISSUES

1. Profits data are in some ways the most problematic in the national accounts. The first part of this Annex discusses some conceptual and measurement issues. Operating surpluses and their estimation at micro and macro level are discussed in the first two sub-sections. Holding gains, an important part of profits as perceived by companies though not found in national accounts, are discussed in Section iii). Calculation of profit rates raises a new set of issues. Any accounting rate of profit, taking the ratio of profits to capital employed in each period, will diverge in practice from the internal rate of return of a process -- the clearest economic concept -- because of dynamic factors. In addition, serious problems of valuation of capital and its depreciation are involved most of which are confused by the commercial practice of historic cost accounting. These matters are discussed in Section iv). This paper uses gross capital stocks in computing profit rates. That avoids measurement of depreciation but estimation of gross capital stocks themselves involves many assumptions and, probably, errors. These matters are dealt with in Part B of the Annex.

i) The operating surplus

2. The logic behind a production account can be indicated by imagining a simplified, idealised process of production in which perfectly divisible inputs and outputs are continuously consumed and produced. In order to measure the profitability of such a process the inputs and outputs obviously have to be valued at the time the production takes place - in other words, at the moment when the various inputs and outputs are actually consumed or produced. This is the basic rationale behind current cost accounting. In deciding whether or not it is worthwhile engaging in a particular process of production there is no sense in using prices for the inputs and outputs which differ from those prevailing at the time and place where the production actually occurs.

3. In practice, processes of production are not ones in which perfectly divisible inputs are instantaneously transformed into perfectly divisible outputs. Thus, it may take several discrete accounting periods to produce a single unit of output - e.g. aircraft, ships or buildings - while conversely a

single input may be only gradually consumed over a number of periods - which applies to capital goods generally. Thus, it is necessary to measure work in progress and changes in stocks in order to arrive at the operating surplus generated within a given accounting period. Moreover, the changes in stocks, whether of durable or non-durable goods, have to be valued at the time when the changes actually occur in order to be consistent with the general philosophy underlying the production account.

4. The practical difficulties of implementing this principle are well known and need not be elaborated at length here. The existence of very large indivisible units greatly complicates economic analysis of all kinds from general equilibrium theory through to economic accounting. The information available to the accountant for an individual firm may relate only to the purchase price paid for some piece of capital equipment several years ago, whereas the information which is ultimately required is the decline in the current value of that equipment during the accounting period. There may well be no current market price on which to base the calculation, because the equipment has been substantially modified or disappeared from the market altogether, while the proportion of the equipment "used up" during the period is notoriously difficult to estimate, bearing in mind that obsolescence needs to be taken into account as well as physical deterioration. While it may be somewhat easier to estimate changes in stocks of non-durable goods at the prices prevailing when the changes take place, the practical difficulties involved here should also not be underestimated, given the kind of records kept by most businesses. For these reasons, most business accountants do not produce estimates of the operating surplus per se (1). It is important to note, however, that the problems involved in estimating operating surpluses for entire industries are not the same as those which confront an individual enterprise.

ii) The operating surplus at micro and macro levels

5. The operating surpluses shown in national accounts bypass some of the problems noted above because they make little, or no, use of the profit figures shown in company accounts: they may, for example, be estimated residually within the framework of an inter-locking set of production accounts in an input-output table whose construction relies heavily on production statistics and the commodity flow method. In one respect it must actually be easier to estimate operating surpluses and rates of return at a macro than a micro level because, when changes in the prices of capital goods have to be estimated over long periods of time, it must be more legitimate to utilise the average price movements shown by price indices when dealing with groups of capital goods held by groups of enterprises, than to apply the same indices to individual goods held by individual firms. It should also be noted that the capital consumption figures in national accounts are generally a by-product of capital stock estimates compiled by the perpetual inventory method in which case they make no use whatsoever of the corresponding depreciation figures shown in business accounts. In contrast, they rely on assumptions about the service lives of assets which tend to be heroic given how little is known about actual scrapping and the extent to which unused capacity can be reactivated (see below -- Estimating the Capital Stock). However, it must be conceded that the estimates of operating surpluses shown in national accounts are inevitably subject to wider margins of error than most other data in the accounts and they have proved to be susceptible to considerable revisions in

practice, chiefly because they are estimated residually at a macro economic level.

6. Furthermore, the diverse nature of the activities being combined makes interpretation even more difficult than at the level of the firm. For instance, the combination of firms exploiting valuable investment opportunities with high returns, with those operating efficiently but close to the margin, with those in uneconomic areas, or incurring losses, produces an aggregate gross operating surplus figure which expresses little about how well the economy is functioning or the extent to which profits are acting as a signal which helps transfer activity from areas of low to high return. In addition, without some knowledge of market structure and the level of protection, profit shares are difficult to interpret.

iii) Holding gains

7. Holding gains do not arise out of production and are not, therefore, relevant to assessing the profitability of production. However, they can be large and so it is necessary to take account of them for several reasons: first, holding gains (or losses) can substantially affect the financial position of a firm and thus its capacity to undertake productive activity and investment; second, they must be deducted if true operating surpluses are to be identified.

8. The nominal holding gain on some goods or financial assets is measured simply by the increase in its price between two moments of time. However, holding gains can equally well be defined with reference to some other numeraire instead of money. In practice, it is generally more useful to choose a broadly based basket of goods and services as the numeraire in preference to a single commodity. Although there is obviously an index number problem involved in the selection of the basket of goods and services to serve as numeraire, the resulting holding gains have a precise meaning. Thus, a real holding gain of x per cent occurs when a given quantity of some good or asset can be exchanged for a specified basket of goods which is uniformly x per cent larger at the end of the period than at the beginning. Real holding gains on goods obviously depend on changes in relative prices. On the other hand, real holding gains on money or financial assets whose market value remains fixed in money terms depend on the average price change for the numeraire basket of goods and services, i.e. on the general rate of inflation in some sense. Obviously, creditors incur real holding losses as a result of inflation, whereas debtors experience gains.

9. Business accounting, which is normally on a historic cost basis, does not distinguish between operating surplus and holding gains. Historic cost accounting tends to charge the goods used up in the course of production at the prices at which they were originally acquired. Thus, it usually includes in profits the nominal holding gains on the stocks of durable and non-durable goods held by firms, which can be quite appreciable in times of high inflation. And, as noted, holding gains are fused with the operating surplus, and the two cannot easily be separated from each other even though their significance is totally different from the point of view of both the economist and the business manager. The failure to make either distinction leads to incoherence: operating surplus is an income flow, whereas nominal holding gains do not constitute income according to any economic criterion.

10. Nominal holding gains may provide receipts in money terms but it is also necessary to set the relevant opportunity costs against these receipts. The opportunity cost of holding a good is the money receipt which could have been obtained by holding another good or some financial asset instead. It is possible to calculate an average of the alternative receipts forgone and by deducting such an average from the nominal holding gain, the real holding gain is effectively obtained. Real holding gains, on monetary assets and liabilities as well as on tangible assets, are ignored in traditional historic cost accounting.

11. It is important to consider historic cost accounting and the biases it introduces, because business perceptions of profitability must be strongly influenced by it. The problems arising are illustrated in the context of rates of return in Part III.D.

iv) Rates of return on production

12. In economic terms, the profitability of an investment project can be precisely defined as its present value at the current market discount rate, or at the internal rate of return, which is that rate of discount at which the present value of the flow of receipts and expenditures attributable to the project is zero. Under certain very stringent conditions, this return can be identified with the average accounting rate of profit over the entire life of the project (2). In practice, these conditions are not met, and when the project is sub-divided into individual accounting periods, the accounting rate of return will usually vary from period to period and will not generally coincide with the internal rate of return. However, it may be asked how these accounting rates relate, on average, to the realised internal rate of return. This question is particularly relevant at a macro-economic level when dealing with industries rather than individual firms.

13. The accounting rate of return on production is usually defined as the ratio of the net profits i.e. the net operating surplus, to the net capital stock employed, both valued, of course, at current prices. However, an alternative measures is also available in the form of the ratio of the gross operating surplus to the gross capital stock (3). As both numerator and denominator are gross there can be no presumption, a priori, that this ratio will be greater than that based on the net figures. Moreover, if the objective is to choose a measure which approximates, on average, to the realised internal rate of return, it is not at all obvious that the net ratio is superior to the gross ratio.

14. Most of the literature on the relationship between average accounting rates of return and the internal rate has focussed on the net accounting ratios, but gross ratios have been recently used by Feldstein and Summers 1977, Hill 1979, and in the OECD Economic Outlook. The gross ratios have, of course, the considerable practical advantage of by-passing the whole problematical area of the measurement of depreciation, or capital consumption, both for profits and the capital stock. This means, in practice, that they are also available for more countries and years.

15. The main conclusion to emerge from the theoretical literature on this subject is that whereas the internal rate of return is sensitive to the time profile of the sequence of profits generated by the initial investment, the

average accounting rates of return are not. An average of the accounting rates of return over the life of a project, or alternatively the aggregate accounting rate of return over a set of different projects within the same accounting period, fails to differentiate between profits which accrue early and late in the life of a project.

16. Thus, the same average or aggregate accounting rate of return, whether gross or net, may be consistent with a range of different internal rates of return corresponding to different time profiles for the same total profits over the life of the project. In practice, therefore, it is necessary to specify the time profile in order to reach any conclusions. If, for example, the sequence of gross profits is constant over the life of the project (corresponding to "one-hoss shay" depreciation) it can be shown that the average ratio of gross profits to the gross capital stock converges fairly quickly on the internal rate of return as the length of life of the project increases (4). On the other hand, the average of the net ratios tends to twice the internal rate in these circumstances, assuming depreciation is calculated by the straight line method which is mostly used in both business and national accounts. When profits tend to decline over the life of an investment project, as seems more likely because of obsolescence and the physical deterioration of the assets concerned, the average of the net ratios is likely to perform better and provide a reasonably close approximation to the internal rate.

17. As already mentioned, there is no presumption that the average of the gross ratios will tend to be higher than that for the net ratios. Assuming straight-line depreciation, the average of the gross ratios tends to be greater than that of the net ratios for projects with fairly short lives or low rates of return, while conversely the average net ratio tends to be the higher for projects with long lives or high rates of return. It follows that there is a medium range of asset lives and rates of return over which the average gross and net ratios tend to be about the same, and experience suggests that they may not be very different in practice (5).

18. Thus, the average gross ratio is not to be considered as an inferior substitute for the average net ratio but rather as a measure which has at least a good a claim in its own right to be used as an indicator of profitability and a proxy for the realised internal rate of return. It is more robust statistically and more widely available, and is used extensively in this paper for these reasons.

19. In order to calculate rates of return in any event it is necessary to measure the capital stock. This is well known to be difficult and is indeed to some extent speculative (6). Assumptions must be made about service lives, the distribution of retirements, and the incorporation of price and quality changes. The possibility that there may have been long-term trends in the durability of physical assets, the effects of the business cycle on capital stock, and the impact of one-off shocks such as the oil price changes of the 1970s in accelerating obsolescence, are considered in Part B. In principle, total capital not just fixed capital is relevant and some observations are also made on the effect of including inventories in estimates of the capital stock (see below).

B. ESTIMATES OF CAPITAL STOCKS

20. This part explains the methods by which capital stock estimates have been made in order to calculate rates of return on capital shown in this report. It is in five sections. The first section explains the methods used; in the second, available evidence on service lives is noted and the role of long-term, cyclical, and one-off changes in affecting the size of the capital stock is discussed. Third, the distribution of retirements is considered. Fourth, price indices and the problem of allowing for quality changes are discussed, followed by, fifth, a note on the adjustment of rates of return by the inclusion of inventories.

i) Methods

21. Without exception, the capital stock statistics used in this report have been estimated by the "perpetual inventory" method, in which an initial estimate of the capital stock is updated each year by adding new investment and deducting retirements. This method makes use of one relatively firm statistic -- annual gross fixed capital formation -- and other information which is much less reliable. These relate to the size of the capital stock at some initial starting point, to the average service lives of different kinds of assets, to the distribution of retirements around the average lives and to changes in the prices of capital assets. To obtain estimates of the net capital stock, information is also needed on the way in which capital assets depreciate during their working lives.

22. Errors in estimating the size of the capital stock at the initial starting point obviously become less important each year the stock figures are updated, because an increasing proportion of the stock will consist of assets put in place after the starting point. For the same reason, the impact of starting-point errors will be further reduced if the capital stock is growing. For the countries considered in this report the starting dates for their capital stock estimates are sufficiently distant, and the growth in their capital stocks has been sufficiently vigorous over the last few decades, for starting-point errors safely to be regarded as trivial. Furthermore, since we are concerned here only with gross rates of return, there is no need to consider the assumptions made about the depreciation of fixed assets since these are only relevant for estimates of the net capital stock. It will, however, be useful to consider briefly how estimates of the gross capital stock are affected by the assumptions made with regard to the other points mentioned above -- service lives, distribution of retirements and price changes.

ii) Service lives

23. Remarkably little firm information is available on the durability -- or "service lives" -- of capital assets. Statistical surveys have been carried out in a few countries, but in general they have either been limited to a few types of assets, such as motor vehicles or machine tools, or they were carried out so long ago that their results may no longer be relevant. Tibor Barna's survey of asset lives in the United Kingdom manufacturing sector was carried out nearly 25 years ago, and Robley Winfrey's estimates for the United States

are more than 50 years old. In the absence of reliable survey data, capital stock estimators have often had to resort to second-best sources, notably company balance sheets and what is optimistically referred to as "expert advice". The problem with using company balance sheets is that assets are almost always valued at historical (or "acquisition") prices, with the result that stocks are valued in company accounts at a mixture of prices for many different years. At its best, "expert advice" may mean consulting panels of production engineers familiar with conditions in a representative cross-section of industries; at the other extreme, "expert advice" may be little more than a euphemism for pure guesswork.

24. Service life is a crucial parameter in the perpetual inventory method. In a steady state the capital stock is simply the product of gross fixed capital formation and the average service life, so that an error of a given percentage in estimating the service life will introduce the same percentage error into the capital stock estimate; if the capital stock is growing, service life errors have a reduced, but by no means insignificant, effect on the capital stock estimates. The weak empirical base for estimating service lives of fixed assets has at least two implications for this study. First, errors in estimating service lives will clearly affect inter-country comparisons of the size of capital stocks (and hence the level of rates of return); secondly, there may be changes over time in service lives and if these are not reflected in service-life estimates, the growth of capital stocks (and hence movements in rates of return and output/capital ratios) will be under- or overstated.

25. Table I.1 gives the estimates of service lives in manufacturing used by twelve OECD countries for their capital stock estimates. Service-life estimates used for assets in other sectors are equally variable (Blades 1983). Table I.1 shows that there is little agreement among statisticians on the durability of apparently similar kinds of equipment: in the chemicals industry of Japan, machinery and equipment apparently lasts only eight years compared with thirty-one years for the United Kingdom; in Sweden, equipment in "clay and stone products manufacturing" lasts thirty-five years compared with a mere fifteen in Australia. The average lives for all manufacturing assets are, of course, much less variable but in countries with the longest service lives -- Norway and the United Kingdom -- manufacturing assets are assumed to last nearly twice as long as (presumably) similar assets in Japan and Australia. While various technical, climatic, fiscal and perhaps social factors may result in genuine inter-country differences in the length of time a given type of asset is kept in use, it is hard to believe that these factors could account for such a wide range of service lives, particularly among countries which in many cases use identical pieces of equipment, and where production techniques are becoming increasingly standardized through the spread of multinational companies. In this connection, it is worth noting that a 1974 study of machine tools in the United Kingdom and the United States (Bacon and Eltis 1974) concluded that service lives were about twenty-four and twenty-five years respectively, compared with eighteen and twenty-seven years shown in Table I.1 for the industry group "fabricated metal products and machinery".

26. One plausible way of interpreting Table I.1 is to make the assumption that the middle group of six countries which use average service lives of seventeen to nineteen years have got their estimates about right. On this admittedly heroic assumption, Japan and Australia are under-estimating service

Table I.1

AVERAGE SERVICE LIVES OF MACHINERY AND EQUIPMENT (EXCLUDING VEHICLES) IN MANUFACTURING ACTIVITIES
(years)

	ISIC	United States	Japan	Germany (a)	France	United Kingdom	Italy	Canada	Australia	Austria	Finland	Norway	Sweden
Food, beverages and tobacco	31												
Food and beverages		(18)	(11)	25	16	(27)	18	29	15	22	20	25	20
Tobacco		(18)	(11)	25	16	(27)	18	15	15	22	20	25	20
Textiles, clothing and leather	32												
Textiles		(18)	(10)	30	20	(29)	18	26	15	18	19	-	20
Clothing		(18)	(11)	30	20	(26)	18	21	15	15	19	-	20
Leather		(18)	(10)	30	20	(26)	18	15	15	(17)	19	-	20
Wood and wood products	33	(18)	(10)	(23)	20	(25)	18	26	15	15	18	-	15
Paper, paper products, printing, etc.	34												
Paper and paper products		(18)	(12)	17	20	(34)	16	22	15	20	17	-	(30)
Printing and publishing		(18)	(12)	30	20	(34)	16	30	15	15	17	-	30
Chemicals, petroleum products, etc.	35												
Chemicals		(18)	(8)	17	16	(31)	16	22	15	18	18	-	15
Petroleum and coal products		(18)	(13)	17	16	(31)	18	26	15	18	18	-	30
Rubber		(18)	(9)	17	16	(26)	15	15	15	18	18	-	15
Plastic products		(18)	(9)	30	16	(26)	15	15	15	18	18	-	20
Non-metallic mineral products	36												
Clay and stone products		(18)	(9)	17	16	(29)	16	26	15	18	15	-	35
Glass		(18)	(9)	30	16	(29)	16	26	15	15	15	-	35
Other		(18)	(9)	17	16	(29)	16	26	15	18	15	-	30
Basic metals	37	(18)	(13)	17	20	(27)	15	22	15	24	15	-	35
Fabricated metal products and machinery	38												
Metal products		(18)	(11)	23	16	(27)	20	21	15	20	15	-	25
Non-electrical machinery		(18)	(12)	23	16	(27)	16	21	15	20	15	-	25
Electrical machinery		(18)	(10)	23	16	(27)	16	22	15	20	15	-	25
Transport equipment		(18)	(11)	23	16	(26)	16	30	15	18	15	-	15
Other manufacturing	39	(18)	(11)	-	20	(26)	18	13	15	-	20	25	20
Arithmetic average of above figures		18	11	23	17	28	17	23	15	19	17	25	23

Source: Service Lives of Fixed Assets, Working Paper No. 4, Economics and Statistics Department, OECD.

Figures in parentheses indicate Secretariat estimates.

a. These figures are taken from an article by Heinrich Lutzel in The Review of Income and Wealth, March 1977. Service lives used in the present capital stock estimates for Germany are somewhat shorter than shown here.

lives, while Canada, Germany, Norway, Sweden and the United Kingdom are overstating them. For the first two countries, measured rates of return and output/capital ratios will be too high because capital stocks are under-estimated; for the last five countries rates of return and output-capital ratios will be too low because their capital stocks are overestimated.

27. As regards changes over time in service lives, three separate issues deserve consideration -- are there any long-term trends in the durability of assets, are there short-term movements in service lives related to the business cycle, and were there any abrupt one-time reductions in asset lives at the time of the two oil shocks? In the almost total absence of any empirical information on these questions, the answers must inevitably be highly speculative.

28. With regard to long-term changes in service lives, articles by experts from the Swedish (Tengblad and Westerlund, 1976) and German (Lutzel, 1977) statistical offices believe that there is a long-term tendency for service lives to decline. Evidence in favour of this view is available from France (Atkinson and Mairesse, 1978), where an analysis of company accounts suggested a slow decline during the 1970s, and from Germany where a survey carried out by the Munich Institute of Economic Research in 1969 found that service lives had been declining over the previous fifteen years and that respondents expected this trend to continue. However, because the evidence for a decline is sparse, OECD countries have, with a single exception, made no allowance for declining service lives in their capital stock estimates. The exception is the United Kingdom which published revised capital stock series in 1983 in which the service lives of plant and equipment in manufacturing are assumed to be falling by about 1 per cent per year, and service lives of buildings by about 0.5 per cent. If the United Kingdom is right and there really is a long-term decline in service lives, the measured growth in the capital stocks for the other countries will be overstated, and the decline in rates of return and output/capital ratios will be over-estimated. However, if the downward trend in service lives really is only about 1 percentage point per year, the failure to allow for it will have a relatively trivial impact on rates of return and output/capital ratios when compared with errors from other sources.

29. As regards the possibility that there may be cyclical changes in service lives, no direct evidence appears to be available for any country. However, it seems entirely reasonable to assume that service lives may change with capacity utilisation. When an establishment is operating at full capacity, assets may well be kept in use beyond their normal working lives, and when demand is low, older assets may be scrapped before the end of their normal lifetimes.

30. In the absence of any evidence on this point, no OECD country makes any attempt to capture these (hypothetical) short-term variations in service lives in their capital stock estimates. If there are indeed cyclical variations in service lives, the capital stock estimates will be too low at cyclical peaks, and too high in cyclical troughs. The opposite applies to rates of return and output/capital ratios which will be over-estimated at peaks and under-estimated in troughs. It should, however, be noted that errors from this source must again be very small relative to other errors known to be present in the capital stock and profit figures. Moreover, the failure to take account of cyclical changes in service lives will have no effect on the

measurement of long-term trends in rates of return which is the main concern of this study.

31. Finally, there is the question of whether accelerated scrapping may have occurred as a result of oil shocks in the 1970s. None of the capital stock estimates for OECD countries assume sudden reductions in service lives in 1974 or 1979, and if the service lives of certain assets did actually fall sharply at these dates, capital stock statistics will overstate, perhaps substantially, the true size of the capital stock in subsequent periods. Again, there does not appear to be any direct evidence on this question, but some indirect evidence is provided in Table I.2, which shows wholesale price indices for scrap metal in the United States (7) and Germany. If exceptional quantities of plant and machinery were scrapped because of the oil shocks, scrap metal prices could reasonably be expected to show a sharp decline relative to the overall price level. In Table I.2 the price indices of scrap metal have been divided by the GDP deflator to produce "normalized" indices. Over the periods 1976 to 1978 and 1980 to 1982, real scrap prices were at substantially lower levels than those prevailing prior to the first oil shock in both countries. On the one hand, demand was weak during this period, and it is difficult to separate "cyclical" effects on prices from the possible supply-side effects of accelerated scrapping. Although there is a good deal of anecdotal evidence of premature scrapping (shipping, chemicals and the steel industries) the importance of this factor cannot be quantified with any precision using scrap metal price indices. On the other hand, capacity levels in U.S. basic materials industries were lowered by up to 3 to 5 per cent in a recent revision, presumably to reflect reduced effective engineering capacity (8).

iii) Distribution of retirements

32. It is clear that not all assets of a particular type will be simultaneously retired at the end of the average service life for that particular type of asset. Like human beings, some will be scrapped earlier because of accidental damage or exceptionally intensive use, while others will continue in service beyond the average life-span. Most countries assume a bell-shaped distribution of retirements around the average service life. At least five different distributions are used by OECD countries -- log-normal, quasi-logistic, Weinbull, gamma and Winfrey -- but as they are mostly symmetrical low-variance distributions, they all give very similar results. However, three countries -- Canada, Italy and Norway -- assume that all assets of a given type are retired simultaneously at the end of their service lives. While "simultaneous exit" is clearly an unrealistic assumption, in the almost total absence of information about when scrapping actually occurs, it can be argued that it is better to make a simple, albeit incorrect assumption, than to give a misleading appearance of precision by adopting a more sophisticated assumption.

33. If retirements equal new additions, the capital stock will be the same size whether simultaneous-exit or a bell-shaped distribution is used, but when the capital stock is growing, simultaneous-exit produces a higher estimate of the gross capital stock than a bell-shaped distribution. For Canada, capital stock estimates have been prepared using different assumptions about retirement distributions. They show that the use of simultaneous-exit instead of a bell-shaped distribution raises the level of the gross capital stock by

Table I.2

WHOLESALE PRICE INDICES OF SCRAP METAL IN THE UNITED STATES AND GERMANY
1976 = 100

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
United States												
1. Steel scrap price index	45.1	47.1	76.0	144.3	96.2	100.0	76.1	100.3	133.2	125.2	122.5	83.6
2. GDP price deflator	72.4	75.5	79.8	86.8	94.6	100.0	111.5	119.1	131.4	146.0	161.6	177.9
3. Normalized scrap index (1 - 2)	62.3	62.4	95.2	166.2	101.7	100.0	68.3	84.2	101.4	85.8	75.8	47.0
Germany												
4. Metal scrap price index	82.3	74.8	93.5	138.8	90.1	100.0	84.8	..	..	..	..	..
5. GDP price deflator	76.1	80.2	85.5	91.2	96.8	100.0	103.7	..	..	..	..	..
6. Normalized scrap index (4 - 5)	108.1	93.3	109.4	152.2	93.1	100.0	81.8	..	..	..	..	..
7. Ferrous scrap price index	..	..	..	..	..	100.0	85.1	80.8	106.0	103.5	100.7	..
8. GDP price deflator	..	..	..	..	..	100.0	103.7	108.0	112.4	117.4	122.3	..
9. Normalized scrap index (7 - 8)	..	..	..	..	..	100.0	82.1	74.8	93.5	88.2	82.3	..

Sources: United States: "Steel scrap price index" is taken from Survey of Current Business, U.S. Department of Commerce, and refers to the price per long ton of "steel scrap, No. 1 heavy melting". "GDP price deflator" is taken from National Accounts, Vol. 1, OECD 1984.

Germany: "Metal scrap price index" covers ferrous and non-ferrous metal scrap, but the latter is a very small part of the total. This index was replaced in 1977 by two indices referring to ferrous and non-ferrous scrap separately. Both indices are taken from Statistisches Jahrbuch 1978 and 1982, Statistisches Bundesamt. "GDP price deflator" is taken from National Accounts, Vol. 1, OECD 1984.

about 5 per cent; the rate of growth of the capital stock also increases, but only marginally. Over the last two decades, the Canadian capital stock has been growing by about 5 1/2 per cent each year. This is broadly the same as in Norway and Italy so the Canadian findings will apply also to these countries. For these three countries, then, rates of return and output/capital ratios will be understated compared with other OECD countries, although the errors involved are likely to be small.

iv) Price indices

34. The "current price" capital stock data used in this study are calculated at the replacement costs of the current year. Each year the assets deemed still to remain in the capital stock are revalued by the average prices of that year before adding on the current year's capital formation. Consequently, the methods used to calculate price indices for capital goods are highly relevant for interpreting capital stock statistics at current (replacement) as well as constant prices.

35. Calculating price changes for capital goods is particularly difficult because of the lack of standardization. No two industrial or commercial buildings are exactly the same, and many types of plant and equipment are manufactured to the purchasers' specifications. A further problem is that, in general, the rate of technological change is probably greater for capital assets than for consumer goods. As a result, in measuring the prices of capital goods the statistician is constantly faced with the problem of dividing an observed price increase into "quality change" and "price inflation". The quality change component is regarded as an increase in the volume of capital, and it is deducted from the observed price increase to obtain the inflation component, which alone enters into the calculation of the price index. The method of estimating the value of quality changes is therefore crucial to the calculation of price indices.

36. Most, if not all, OECD countries adjust for quality changes by reference to "resource-cost". If the price of a capital good increases, the statistician first enquires whether it incorporates any substantial new features that could be regarded as an improvement from the users' point of view. If so, an estimate is made of the cost to the producer of incorporating the new feature. This "resource-cost" is taken as the value of the quality change associated with the new feature, and is deducted from the observed price increase in order to obtain the inflation component. Two aspects of this procedure deserve comment.

37. First, a price increase is almost always needed to alert the statistician to the possible need for a quality-change adjustment. This means that costless quality improvements -- ones that manufacturers introduce without having to increase prices -- almost never lead to any adjustment for quality change. The price index will remain constant, although it could clearly be argued that in this case the price index should fall.

38. The second, more general point is that the "resource cost" of improving a capital good may be quite different from the "user-value" -- i.e. the value

to users as measured by what they would be willing to pay for the new feature. Obviously, resource-cost cannot exceed user-value because if it did, no-one would buy the new version of the capital good, and it is also clear that in equilibrium resource-cost may be expected to equal user-value. But in a world of rapid technological change, equilibria will rarely if ever be reached, and user-value may substantially exceed user-cost.

39. If resource-costs are generally lower than user-values, price indices in which adjustments for quality change are based on resource-cost will rise faster than indices in which the adjustments are based on user-values. This has two important implications. First, capital stock estimates compiled with the use of resource-cost indices, will be lower, and grow more slowly, than if user-value indices had been used. Secondly, capital stock figures are to be interpreted as measures of the resources that, over a period of years, have been devoted to capital formation, and they are imperfect measures of the productive potential embodied in the capital stock.

v) Adjusting rates of return for the inclusion of inventories

40. One possible reason for the secular decline in measured rates of return is the exclusion of inventories from the capital stock estimates. The exclusion of inventories will overstate the level of measured rates of return. However, a systematic trend will only be introduced if there has been a steady drop in stock/output ratios over time, due for example to improvements in inventory management techniques. To obtain some impression of orders of magnitude, a rough adjustment was made for five countries. Data availability restricted this to the total business sector; and even here the coverage was not ideal, as farm stocks are included. In general, the inclusion of inventories appears to boost capital stock estimates by roughly 10-20 per cent (see Table I.3). However, although the level of realised rates of return is lowered by 11 to 18 per cent, any biases introduced into long-term trends appear minor. For example, in the United Kingdom, inventory to GDP ratios show no visible trend since 1959. In the United States, where advances in inventory management techniques are reputed to be important, the inventory to sales ratio in manufacturing and trade dropped from 1.8 to 1.55 from mid-1982 to early 1984. However, even the latter figure was closely in line with or at most marginally below the 1959-1983 average. Hence, a preliminary conclusion is that more efficient inventory management has not been a significant factor explaining the measured drop in rates of return using only fixed capital.

Table I.3

RATES OF RETURN IN TOTAL BUSINESS SECTOR

(Percentages)

	Rate of return excluding stocks			Rate of return including stocks		
	Beginning date	End date	Mean	Beginning date	End date	Mean
United States	16.2 (1960)	12.1 (1981)	15.3	13.6 (1960)	10.2 (1981)	12.8
Germany	24.3 (1960)	15.3 (1980)	18.5	19.4 (1960)	12.7 (1980)	15.1
France	21.7 (1967)	19.3 (1980)	21.5	19.0 (1967)	16.1 (1980)	18.1
United Kingdom	13.3 (1965)	9.4 (1971)	11.1	11.4 (1965)	8.3 (1971)	9.6
Canada	13.3 (1960)	9.7 (1982)	12.8	11.7 (1960)	8.9 (1982)	11.4

Source: OECD Secretariat.

NOTES

1. It would be virtually impossible to produce estimates sufficiently reliable and objective to be acceptable to auditors, shareholders, tax inspectors, and third parties generally. This point is also taken up in the discussion of different systems of accounting (see below).

2. It is well known in the theoretical literature that if the depreciation formula used is so-called "economic" depreciation the accounting rates of return always coincide with the internal rate However, in order to calculate economic depreciation it is necessary to know the internal rate in advance, which makes the accounting exercise rather pointless. For an exposition of these conditions see Fisher et. al., 1983.

3. Gross capital stock is the value at current replacement cost of all assets in place, as if they were new. Net capital stock is the current replacement cost of the same assets in their present condition. The difference between the two concepts is accumulated capital consumption. The gross stock is evaluated as if all assets are new while in the net stock, assets are valued after deducting capital consumption.

4. Hill, 1979, p.44.

5. Feldstein and Summers, 1977; Hill, 1979.

6. For example, how should retro-fitting in response to higher energy costs be treated? In practice, a part of expenditure on maintenance may be related to the upgrading of existing equipment. Also see Revsine 1981, Hibbert 1983, p.31.

7. The suggestion to use scrap metal prices as an indicator of changes in asset lives was made by John Gorman of the United States Bureau of Economic Analysis. Germany appears to be the only other OECD country which publishes price data for scrap metal.

8. Engineering capacity measures are relatively reliable estimates of capacity in these industries, as they are typically continuous process in nature.

Annex II

THE INFLUENCE OF CAPACITY UTILISATION, INTERNATIONAL COMPETITIVENESS AND INFLATION ON PROFITABILITY

1. A number of factors which may affect profit rate developments were surveyed in Part IV of the main paper. This Annex presents a preliminary data analysis in the light of some of these hypotheses. The role of rates of capacity utilisation and the relative international price competitiveness of manufacturing industry are tested. In addition, the inflation rate and time trends (to capture other secular factors) are also entered.

2. Three simple equations were estimated for gross rates of return on capital in manufacturing for ten countries (Annex Table II.1). They are:

$$GRR = a_0 + a_1\ CU + a_2\ RULC + a_3\ RULC_{t-1} \quad (1)$$

$$GRR = a_0 + a_1\ CU + a_2\ RULC_t + a_3\ RULC_{t-1} + a_4\ Time \quad (2)$$

$$GRR = a_0 + a_1\ CU + a_2\ RULC_t + a_3\ RULC_{t-1} + a_4\ Time + a_5\ PGDP \quad (3)$$

where GRR: gross rate of return on capital in manufacturing;
CU: capacity utilisation in manufacturing, defined as deviations in industrial output from a nine-year moving average;
RULC: relative unit labour costs in manufacturing, expressed in a common currency (U.S. dollars);
PGDP: percentage change in the GDP deflator.

The variables are expressed in logarithms, the PGDP deflator in percentage change form.

3. Expected signs for the independent variables are as follows. The coefficient a_1 with respect to capacity utilisation rates should be unambiguously positive. Differences in estimated values of a_1 between countries can be expected to reflect, inter alia, the flexibility with which manufacturing employment is adjusted to output, as well as wage flexibility between countries. The sum of the coefficients a_2 and a_3 attached to RULC should unambiguously be negative as a deterioration in competitive position is detrimental to profits. As this variable is expressed in a common currency, it will reflect the failure of shifts in exchange rates to exactly offset relative cost changes. For any given change in RULC, the estimated coefficients a_2 and a_3 should differ among countries according to the degree of openness and will be greater to the extent that their manufacturers

Table II.1

GROSS PROFIT RATES, CAPACITY UTILISATION AND INTERNATIONAL COMPETITIVENESS

			Constant	Capacity utilisation	Relative unit labour costs		Time	PGDP	R^2	DW	SEE
					t	t-1					
United States	1	1964-82	3.0** (0.09)	0.79* (0.31)	-2.15** (-0.44)	1.46** (0.44)			0.74	1.2 (a)	0.06
	2		3.1** (0.5)	0.83 (0.40)	-2.10** (-0.60)	1.49* (0.61)	-0.004 (-0.05)		0.73	1.2 (a)	0.07
	3		2.9** (0.7)	0.74 (0.42)	-2.35* (-0.79)	1.53 (0.67)	0.008 (0.06)	0.70 (1.57)	0.70	1.0 (a)	0.07
Japan	1	1966-82	3.5** (0.1)	1.0** (0.14)	-0.66** (-0.10)	-0.22 (-0.11)			0.989	1.5	0.03
	2		3.5** (0.04)	1.0** (0.17)	-0.66** (-0.11)	-0.21 (-0.14)	-0.0005 (-0.005)		0.989	1.5	0.03
	3		3.5** (0.07)	0.98** (0.22)	-0.75 (-0.30)	-0.15 (-0.24)	0.0009 (0.007)	0.17 (0.56)	0.988	1.4	0.03
Germany	1	1964-82	2.9** (0.2)	1.0** (0.26)	-0.98** (-0.28)	0.38 (0.28)			0.885	1.7 (a)	0.04
	2		2.7** (0.2)	0.9** (0.3)	-1.18** (-0.3)	0.07 (0.35)	0.027 (0.019)		0.90	1.7 (a)	0.04
	3		2.6** (0.2)	0.85* (0.30)	-1.3 (-0.5)	0.16 (0.48)	0.03 (0.02)	0.40 (1.2)	0.888	1.7 (a)	0.04
France	1	1964-82	2.8** (0.3)	2.58** (0.34)	0.58 (0.36)	-1.10* (-0.39)			0.903	2.2 (a)	0.05
	2		2.5** (0.05)	1.64** (0.27)	-0.08 (-0.29)	-9.7** (-0.26)	0.045** (0.007)		0.979	2.2 (a)	0.04
	3		2.5** (0.05)	1.73** (0.27)	-0.63 (-0.48)	-0.42 (-0.46)	0.04** (0.008)	1.5 (1.1)	0.981	2.3 (a)	0.04
United Kingdom	1	1964-82	2.5** (0.04)	1.35 (0.75)	-1.80** (-0.34)	1.37** (0.36)			0.920	1.6	0.10
	2		2.7** (0.1)	1.45 (0.7)	-1.41** (-0.39)	1.25** (0.35)	-0.03 (-0.02)		0.930	1.6	0.10
	3		2.7** (0.1)	1.12 (0.70)	-0.19 (-0.85)	0.06 (0.82)	-0.03 (-0.02)	-2.0 (-1.3)	0.937	1.9	0.09
Italy	1	1964-82	2.8** (0.1)	2.55** (0.37)	-0.23 (-0.22)	0.28 (0.22)			0.793	1.4 (a)	0.06
	2		1.6* (0.6)	2.1** (0.4)	-0.80* (0.37)	0.075 (0.24)	0.12 (0.065)		0.821	1.5 (a)	0.06
	3		1.3 (0.7)	1.7** (0.5)	-1.14* (-0.43)	0.20 (0.26)	0.15* (0.065)	0.90 (0.75)	0.837	1.2 (a)	0.05

Table II.1 continued

			Constant	Capacity utilisation	Relative unit labour costs		Time	PGDP	R^2	DW	SEE
					t	t-1					
Canada	1	1964-82	2.6** (0.03)	2.96** (0.44)	0.41 (0.47)	-0.82 (-0.52)			0.866	1.4	0.07
	2		2.5** (0.1)	2.98** (0.43)	0.55 (0.48)	-1.02 (-0.49)	0.006 (0.1)		0.880	1.7 (a)	0.06
	3		2.4** (0.1)	3.96** (0.7)	2.1 (1.0)	-2.8* (-1.1)	0.026 (0.02)	-3.23 (-1.8)	0.89	1.6 (a)	0.06
Finland	1	1972-82	2.5** (0.1)	3.4** (0.6)	-0.32 (-0.40)	0.40 (0.39)			0.793	1.8	0.08
	2		3.0** (0.7)	4.5* (1.8)	-0.28 (-0.43)	0.96 (0.95)	-0.06 (-0.10)		0.773	1.8	0.08
	3		2.5* (0.7)	3.6 (1.7)	-1.01 (0.6)	1.3 (0.9)	-0.02 (-0.09)	1.82 (1.19)	0.814	1.8	0.08
Norway	1	1964-82	2.3** (0.2)	-0.15 (-0.5)	-1.06 (-0.8)	0.68 (0.82)			0.06	1.5 (a)	0.14
	2		0.8 (0.8)	0.20 (0.52)	-2.0* (-0.9)	-0.22 (0.9)	0.18 (0.09)		0.224	1.3 (a)	0.13
	3		1.0 (1.0)	0.12 (0.53)	-2.09* (0.9)	0.18 (1.2)	0.15 (0.12)	0.72 (1.6)	0.17	1.3 (a)	0.13
Sweden	1	1964-82	2.3** (0.04)	5.1** (0.8)	-1.23* (0.5)	0.6 (0.5)			0.93	1.3	0.10
	2		2.4** (0.14)	5.24** (0.85)	-1.08 (-0.58)	0.6 (0.5)	-0.01 (-0.02)		0.927	1.3	0.10
	3		2.5** (0.2)	5.45** (0.9)	-0.22 (-1.35)	-0.13 (-1.2)	-0.017 (-0.02)	-1.95 (-2.75)	0.924	1.6	0.10

Note: Standard errors in brackets, * and ** significant at a 5 per cent and 1 per cent level, respectively.

a. Corrected for first-order autocorrelation using the Cochrane-Orcutt method.

are price takers. The coefficient a_4 attached to the time trend variable can be positive or negative, as can a_5, depending on the pricing policies of firms and their ability (and perception) to pass cost increases on into prices.

4. These simple equations appear to "explain" much of the variation in gross profit rates, with the exception of Norway. In the first three equations the capacity utilisation variable is in almost all cases correctly signed and appears well-determined. There is a marked range of estimates among countries appearing to reflect different employment practices and wage-setting. The RULC variable is correctly signed and apparently statistically significant in the great majority of countries apparently underlining the relevance of competitive factors in profit determination. However, there is a considerable problem of multicollinearity; a number of countries have experienced persistent trends in RULCs over the sample period. Due to the correlation between the RULC variable and time, it is not possible to say how much of the correlation between profits and competitiveness is spurious. The time-trend coefficients in equation (2) remain negative in the United States, Japan, the United Kingdom, Finland and Sweden, even when allowance is made for cyclical and international competitiveness effects. The estimated coefficients are often smaller, however, and standard errors relatively greater. For some countries (Germany, France, Italy, Canada and Norway) the time trend becomes positive. On the face of it that suggests that the entire decline in profitability in these countries is owing to movements in the real exchange rate and in capacity utilisation. However, the presence of collinearity makes such a conclusion unsound. The most that can be said is that these influences probably made a considerable contribution to the decline.

5. To eliminate the influence of time in RULC, this variable was also tested in detrended form. The variable retained some explanatory value in many countries indicating that the relation to profitability is not entirely spurious. Rigorous hypothesis testing is impossible, however, as the Durbin-Watson statistics indicate the presence of serial correlation. To counteract this a variable representing the influence of higher general inflation was entered. In addition to inertia in the pricing policies of the firm (1), this variable will also reflect inter-sectoral terms-of-trade shifts against the manufacturing sector, especially those sparked by commodity or oil prices. While statistical fits are often improved this is at the cost of further collinearity and the problem of autocorrelation is rarely relieved.

Causality tests

6. As it is difficult to assess the direction of causation between rates of return and investment, a simple test was made to identify possible causal links for six countries. The following model was estimated:

$$RRT = a_0 + a_1\, RRT_{-2} + a_2\, RRT_{-1} + RES1 \qquad (1)$$

$$INV = b_0 + b_1\, INV_{-2} + b_2\, INV_{-1} + RES2 \qquad (2)$$

$$RES2 = c_0 + c_1\, RES1_{-2} + c_2\, RES1_{-1} + c_3\, RES1 + c_4\, RES1_{+1} + c_5\, RES1_{+2} + U \qquad (3)$$

where RRT and INV are changes in natural logarithms (in first difference form) of the rate of return on capital and investment respectively. Equations (1) and (2) are estimated to generate stationary time series. If this filter is efficient, RES1 and RES2, the residuals in the time series, should be purely

random (which appears to be the case). The causality test (Granger, 1980), consists of regressing the lagged, coincident, and leading values of RES1 on RES2 (equation 3). If the lagged values are positive and significant, one can conclude that the relation is dominantly one where rates of return "Granger cause" investment. If the leading values are positive and significant, the opposite direction of causality is suggested. Further, if the leading values are negative and significant, this strengthens the conclusion that the direction of causation runs from RRT to INV. As can be seen from Table II.2, the significance of lagged values and a number of negative leading residuals strongly suggests that the influence of rates of return on investment is stronger than the opposite relationship.

NOTE

1. For example, historical cost accounting practices in periods of high inflation might give false signals concerning true profits.

Table II.2

CAUSALITY TESTS

	Constant	$RESI_{-2}$	$RESI_{-1}$	RESI	$RESI_{+1}$	$RESI_{+2}$	R^2	DW	SEE
United States	-0.01 (-0.05)	0.37 (0.44)	1.5* (0.5)	-0.48 (-0.5)	-0.4 (-0.5)	0.23 (0.47)	0.283	2.7	0.20
Japan	-0.12 (-0.11)	-0.31 (-0.82)	0.65 (0.83)	-0.40 (-0.77)	-2.9* (-0.75)	-0.20 (-0.77)	0.643	2.3	0.28
Germany	-0.03 (-0.06)	0.56 (1.3)	3.0* (1.2)	-1.8 (-1.0)	-2.5* (-1.0)	-2.0 (-1.2)	0.456	3.0	0.26
France		1.3** (0.2)	0.87* (0.23)	-0.25 (-0.22)	-0.47 (0.23)	-0.42 (-0.23)	0.890	0.3	0.09
United Kingdom	0.05 (0.025)	-0.63 (-0.29)	-0.54 (-0.29)	-0.59* (-0.26)	-1.05** (0.30)	-0.55* (0.24)	0.366	1.5	0.10
Canada	0.03 (0.05)	0.85 (0.86)	0.26** (0.08)	0.55 (0.65)	-1.03 (0.7)	1.4 (0.8)	0.462	2.7	0.20

Note: Standard errors in brackets. Sample periods as in Table II.1.

* and ** significant at a 5 and 1 per cent level respectively.

Annex III

SOURCES AND METHODS

SOURCES FOR CHART A ON LONG-RUN PROFIT SHARES FOR JAPAN, NORWAY, UNITED KINGDOM AND UNITED STATES

Japan: Patterns of Japanese Economic Development: A Quantitative Appraisal, edited by Kazushi Ohkawa and Miyohei Shinohara, Yale, 1979.

Norway: Nasjonalregnskap, 1865-1960, Statistisk Sentralbyra, Oslo, 1965.

United Kingdom: National Income Expenditure and Output of the United Kingdom, 1855-1965, by C.H. Feinstein, Cambridge, 1972.

United States: The National Income and Product Accounts of the United States, 1929-76, United States Department of Commerce, Washington D.C., 1981, and Economic Report of the President, Washington D.C., 1984.

SOURCES FOR TABLES SHOWING NET AND GROSS RATES OF RETURN, PROFIT SHARES AND OUTPUT-CAPITAL RATIOS

1. Data on gross operating surplus and gross value added are taken from country replies to the joint OECD-United Nations annual national accounts questionnaire. A selection of these statistics are published in National Accounts, Volume II Detailed Tables (annual), OECD, Paris.

2. Estimates of consumption of fixed capital were also taken from the annual national accounts questionnaire provided the data are on a replacement-cost basis. If they are reported in this source at historic or aquisition cost, estimates at replacement cost can be found for some countries in the same source used for data on capital stocks (see 3.).

3. For net and gross capital stocks, the following sources have been used:

United States:	Fixed Non-Residential Business and Residential Capital in the United States, 1925-79, Fixed Reproducible Tangible Wealth in the United States, and Survey of Current Business (monthly), United States Department of Commerce, Washington D.C.
Japan:	Non-residential Business Capital Stock in Japan (annual), Economic Planning Agency, Tokyo.
Germany:	Fachserie 18, Reihe 1 (annual), Wiesbaden.
France:	L'évaluation du capital fixe productif : Méthodes et résultats by Jacques Mairesse, INSEE, Paris 1972 and data provided by INSEE, Paris.
United Kingdom:	Data provided by the Central Statistical Office, London.
Italy:	Capital Fisso Riproducibile delle Attivita Industriali, Istituto Centrale di Statistica (ISTAT), Rome 1975, and data provided by ISTAT.
Canada	Fixed capital flows and stocks (annual), Statistics Canada, Ottawa.
Australia:	Current Cost and Constant Cost Depreciation and Net Capital Stock, Occasional Paper, Studies in National Accounting, Australian Bureau of Statistics, Canberra, 1981.
Belgium:	Secretariat estimates based on data from the Bureau du Plan, Brussels. Original data in constant prices have been converted to current prices using price indices for gross fixed capital formation.
Denmark:	Danish Confederation of Industry
Finland:	Data provided by the Central Statistical Office, Helsinki.
Norway:	Data provided by the Statistik Sentralbyra, Oslo.
Sweden:	Statistika Meddelanden (annual), Stockholm. The original data in constant prices have been converted by the Secretariat to current prices using the price index for gross fixed capital formation.

BIBLIOGRAPHY

Atkinson, Margaret and Mairesse, Jacques, "Length of Life of Equipment in French Manufacturing Industries", in Annales de l'INSEE, No. 30-31/1978, INSEE, Paris, 1978.

Auerbach, A.J., "Taxation, Corporate Financial Policy and the Cost of Capital", Journal of Economic Literature, Vol. XXI, September 1983, pp. 905-940.

Bacon, R.W. and Eltis, W.A., The Age of U.S. and U.K. Machinery, NEDO Monograph 3, London, 1974.

Beenstock, Michael, The World Economy in Transition, George Allen and Unwin, London, 1973.

Blades, Derek, "Service Lives of Fixed Assets", Working Paper No. 4, OECD Economics and Statistics Department, March 1983.

Encaoua, David, "Price Dynamics and Industrial Structure: A Theoretical and Econometric Analysis", OECD Working Paper No. 10, 1983.

Feldstein, M., "Inflation, Tax Rates and the Stock Market", Journal of Monetary Economics, Vol.6, No.3, July 1980, pp. 309-331.

Feldstein, M., "Inflation, Tax Rules and Investment: Some Econometric Evidence", Econometrica, Vol. 50, No. 4, July 1983, pp. 525-862.

Feldstein, M. and Summers, L., "Is the Rate of Profit Falling?", Brookings Papers on Economic Activity 1:1977, pp. 211-228.

Fisher, F.M. and McGowan, J.J., "On the Misuse of Accounting Rates of Return to Infer Monopoly Profits", American Economic Review, March 1983, pp. 82-97.

Fisher, F.M., "The Misuse of Accounting Rates of Return: Reply", American Economic Review, June 1984.

Flemming, J.S., Price, L.D.D., and Byers, S.A., "The Cost of Capital, Finance and Investment", Bank of England Quarterly Review, June 1976, pp. 193-205.

Geske, R. and Roll, R., "The Fiscal and Monetary Linkage Between Stock Returns and Inflation", Journal of Finance, Vol. 38, No. 1, March 1983, pp. 1-33.

Glyn, Andrew, "The Cambridge Economic Policy Group and Profits", Socialist Economic Review, David Currie and Malcolm Sawyer (eds), Merlin Press, London 1982.

Goodwin, R.M., "A Note on Wages, Profits and Fluctuating Growth Rates", Cambridge Journal of Economics, 1983, 7, pp. 305-309.

Gordon, Myron J., "The Impact of Real Factors and Inflation on the Performance of the U.S. Stock Market from 1960 to 1980", The Journal of Finance, Vol. 38, No. 2, May 1983, pp. 553-563.

Granger, C.W.J., "Testing for Causality", Journal of Economic Dynamics and Control, 1980.

Helliwell, J.F., Sturm, P.H. and Salou, G., "International Comparison of the Sources of Productivity Slowdown 1973-82", International Seminar on Macroeconomics, Perugia 24th-26th June, 1984.

Hibbert, J.H., Measuring the Effects of Inflation on Income, Saving and Wealth, OECD 1983.

Hill, T.P., Profits and Rates of Return, OECD 1979.

Kay, J.A., "Accountants too could be Happy in a Golden Age: The Accountant's Rate of Profit and the Internal Rate of Return", Oxford Economic Papers, November 1976, pp. 447-460.

Kregel, J.A., Rate of Profit, Distribution and Growth: Two Views, Macmillan Press, London 1971.

Lutzel, Heinrich, "Estimates of Capital Stocks by Industries in the Federal Republic of Germany", The Review of Income and Wealth, March 1977.

Malinvaud, E., Profitability and Unemployment, Cambridge Press, Cambridge 1980.

Miles, J.A., "Taxes and the Fisher Effect: A Clarifying Analysis", Journal of Finance, Vol. 38, No. 1, March 1983, pp. 67-77.

Modigliani, F. and Miller, M., "The Cost of Capital, Corporate Finance and the Theory of Investment", American Economic Review, June 1958, pp. 261-297.

Morishima, M., Marx's Economics: A Dual Theory of Value and Growth, Cambridge University Press 1973.

Mortensen, J., "Profitability, Relative Factor Prices and Capital/Labour Substitution in the Community, the United States and Japan, 1960-1983", European Economy, No.20, July 1984, publication of the Commission of the European Communities.

Nelson, Richard R., "Research on Productivity Growth and Productivity Differences: Dead Ends and New Departures", Journal of Economic Literature, September 1981, pp. 1029-64.

Nordhaus, W.D., "Recent Developments in Price Dynamics", in The Econometrics of Price Determination, Board of Governors of the Federal Reserve System, Washington, D.C. 1972.

Nordhaus, W.D., "The Falling Share of Profits", Brookings Papers on Economic Activity, 1:1974, pp. 169-208.

Pen, J., "Profits as a Rich Source of Puzzlement", De Economist, Vol. 128, Issue 3, 1980, pp. 285-314.

Revsine, L., "A Capital Maintenance Approach to Income Measurement", Accounting Review, April 1981.

Samuelson, P.A. and Scott, A., Economics, 4th edition, McGraw-Hill, Toronto, 1975.

Scitovsky, Tibor, "A Survey of Some Theories of Income Distribution", pp. 15-31 in The Behaviour of Income Shares, Studies in Income and Wealth, Vol. 27, National Bureau of Economic Research, Princeton 1964.

Smith, Owen E., Trade Unions in the Developed Economies, Croom Helm, London, 1981.

Solow, R.M., Capital Theory and the Rate of Return, North Holland Press, Amsterdam 1963.

Sylos-Labini, Paolo, "Factors Affecting Changes in Productivity", Journal of Post-Keynesian Economics, Winter 1983/84, Vol. VI, No. 2, pp. 161-179.

Tarasofsky, A., Roseman, T.G., Waslander, H.E., "Ex post Aggregate Real Rates of Return in Canada: 1947-76", Economic Council of Canada, 1981.

Tengblad, Ake and Westerlund, Nana, "Capital Stock and Capital Consumption Estimates by Industries in the Swedish National Accounts", The Review of Income and Wealth, December 1976.

Tobin, J., "A General Equilibrium Approach to Monetary Theory", Journal of Money, Credit and Banking, February 1969.

Turner, P.P., "Import Competition and the Profitability of United Kingdom Manufacturing Industry", The Journal of Industrial Economics, December 1980, pp. 155-166.

Turner, P.P., International Aspects of Inflation, OECD Occasional Studies 1980.

Von Beyme, Klaus, Challenge to Power: Trade Unions and Industrial Relations in Capitalist Countries, Sage Publications, London 1980.

Ward, M., The Measurement of Capital, OECD, 1976.

Wassell, M., "Investment, Profitability and Uncertainty", Document No. 702/129, Economic Secretariat, ICC-UN, GATT Economic Consultative Committee, 14th Session, 19th/20th April, 1983.

Weisskopf, T.E., Bowles, S. and Gordon, D.M., "Hearts and Minds: A Social Model of U.S. Productivity Growth", Brookings Papers on Economic Activity, 2, 1983, pp. 381-450.