

## Measures of real profitability

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### Summary

Previous articles in the *Bulletin*[1] have drawn attention to the decline since 1960 in companies' real profitability and to the rationale for emphasising the real rate of return on total trading assets rather than the rate of return measured in the traditional way, i.e. in terms of historic costs. This article examines longer-term trends in real profitability, measured for the most part in terms of the share of profits in national income. Because of institutional changes, e.g. the trend towards incorporation and the widening of public ownership, the most appropriate measure of 'profits' in examining long-term changes is probably wider than 'company profits' as recorded in the national accounts. An estimate of 'total entrepreneurial profits' has therefore been made, comprising company trading profits and rent, the trading surpluses of public corporations and the profit element of self-employment income. Even this measure, however, is still biased because of changes in the relative size of the entrepreneurial sector over time. Figures are, therefore, also presented for the share of profits in companies' value-added, which overcomes the distortions arising from changes in the scale of the company sector relative to the economy as a whole.

Some possible explanations of changes in real profitability, in particular changes in capacity utilisation and in the rate of change of costs, are examined, and the results of a simple statistical investigation are set out in the appendix.[2]

Estimates of the pre and post-tax real rates of return on total trading assets provided in the earlier articles have been updated to 1977. Trends in these estimates are compared with alternative estimates derived from company accounts. For some purposes, e.g. in making decisions about expansion or the optimal balance between the use of capital and labour, the return to total trading assets is probably the most appropriate measure. For others, however, e.g. in considering developments in the equity market, the real return to the shareholders' (or equity) interest in the trading assets is perhaps more relevant. Estimates of this are also provided.

The main conclusions of the article are that:

- the decline in real profitability since 1960, shown in the previous *Bulletin* articles, appears to have been a continuation of a longer-term trend;
- the recession appears to have been largely responsible for the marked fall in real profitability between late 1973 and late 1975 (although the acceleration in cost inflation also contributed, perhaps because of an adherence to historic cost-plus price setting rules and the requirements of the price code). However, there also appears to be a significant secular downward trend in profitability;
- the modest recovery in profitability between late 1975 and 1977 stemmed mainly from the deceleration in the rate of cost inflation; and
- real rates of return to the equity interest, both pre and probably also post-tax, have also fallen in the mid-1970s, but by less than the return on total trading assets.

[1] March 1976, page 36; June 1977, page 156.

[2] The appendix is mainly the work of N. H. Jenkinson.

## Shares of profits in national income

This section considers first the path of the share of real company profits (as measured in the national accounts) in net domestic income. Institutional changes and weaknesses in the data make long-term comparisons of profitability calculated in this way difficult. Consideration is then given, therefore, to the share of real entrepreneurial profits in net domestic income (that is, a more broadly-defined measure of profitability) and the share of real profits in companies' value-added.

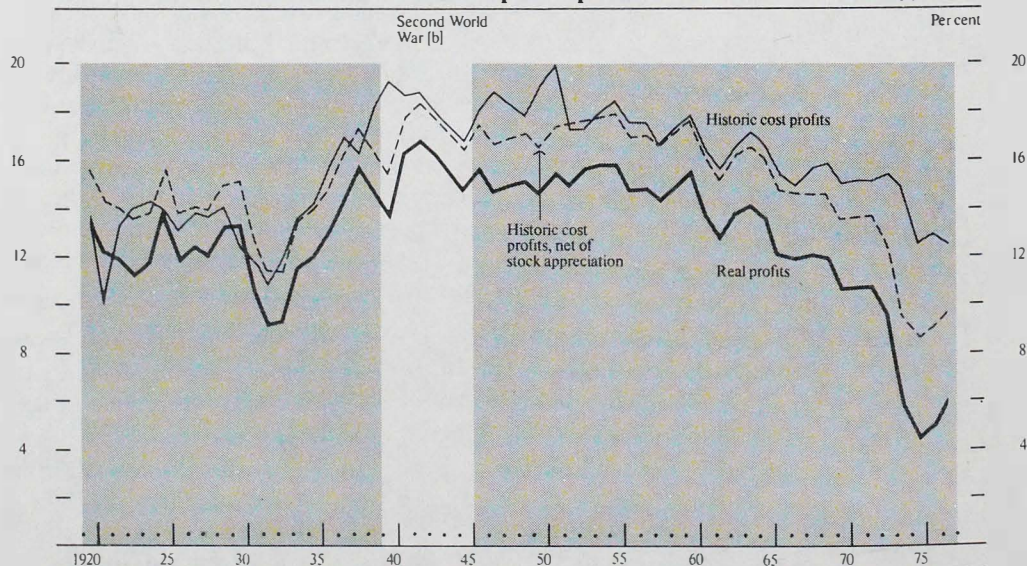
**Table A**  
Shares of industrial and commercial companies' (non-North Sea) profits in domestic income 1920-1977

Per cent	Historic cost profits	Profits, net of stock appreciation	Real profits
1920-24	13	14½	12
1925-29	13½	14½	12½
1930-34	12	13	11
1935-39	16½	15½	14
1940-44	18½	17½	15½
1945-49	18	17	15
1950-54	18½	17½	15½
1955-59	17½	17	15
1960-64	16½	16½	14
1965-69	15½	15	12½
1970-73	15	13½	10½
1974-77	13	9	5½

### The share of company profits in national income

Chart A and Table A show, for the years 1920 to 1977,[1] the share of companies'[2] pre-tax real profits in domestic income and, by way of comparison, the shares of historic cost profits and profits, net of stock appreciation.[3] The share of real profits shows no evidence of a declining trend until the mid-1950s. During the 1920s and early 1930s (when output grew at an average rate of about 1½% per annum) it fluctuated between about 14% (in 1925) and 9% (in 1932). It rose during the late 1930s as economic activity picked up from the depression, and during the period 1945-55 (when output grew at an average rate of about 2½% per annum) it fluctuated between about 14½% and 16%. There was then a steady fall to about 10%-11% in the early 1970s and, reflecting the recession and the acceleration of

**Chart A**  
The shares of industrial and commercial companies' profits in total income 1920-1977[a]



[a] The different measures are defined in footnote [3], below.

[b] Figures for the Second World War are less securely based.

- [1] Estimates for earlier years are derived from C. H. Feinstein, *Statistical Tables of National Income, Expenditure and Output of the UK 1855-1965* (Cambridge University Press, 1972). Earlier figures are probably less reliable.
- [2] This section deals with the profitability of industrial and commercial companies' non-North Sea activities (more specifically, activities other than oil and gas production). The impact of North Sea oil and gas production on published figures for industrial and commercial companies has grown in the last few years. Profits on North Sea operations built up rapidly in 1976 and 1977, and in 1977 totalled about £1½ billion, over 10% of industrial and commercial companies' total gross trading profits.
- [3] Companies' real profits share is measured as real profits (industrial and commercial companies' non-North Sea gross trading profits, plus rent, net of stock appreciation and capital consumption at replacement cost) as a percentage of net domestic income (total domestic income, net of stock appreciation and capital consumption at replacement cost). In measuring the shares of historic cost profits and profits, net of stock appreciation, in domestic income, the denominators have been measured as total domestic income and total domestic income, net of stock appreciation, respectively.

inflation, an abrupt fall to as little as 5% in 1975. In 1977, the share of real profits rose slightly, to about 6%.

The shares of profits measured in historic cost terms and net of stock appreciation followed broadly similar paths to that of real profits (generally no more than three percentage points higher) until the late 1960s. In some years during the 1920s and early 1930s, the share of profits, net of stock appreciation (and also on occasions, the share of real profits), exceeded the share of historic cost profits as the price of stocks fell. The divergence since the late 1960s reflects the impact of accelerating inflation on both stock appreciation (which is affected by the current rate of inflation) and on capital consumption at replacement cost (which depends on the accumulated effects of inflation over the lifetime of assets).[1]

#### *The share of entrepreneurial profits in national income*

A number of institutional changes, e.g. the trend towards incorporation and the widening of public ownership, complicate the choice of an appropriate measure of profits. When real profits are adjusted to make allowance for these influences—that is, when the definition is widened to ‘entrepreneurial profits’[2]—the picture changes significantly (see Chart B and Table B).

Although the year-to-year picture is obscured to some extent by cyclical fluctuations, the share of real entrepreneurial profits in net domestic income may have been a little higher in the inter-war period than in the immediate post-war period, whereas the share of real company profits was lower. Since the war, however, there has been a pronounced fall in the share of real entrepreneurial profits from about 20% in the 1950s to 9% in 1974–77.

#### *The share of profits in companies' value-added*

Changes in the share of real company profits in net domestic income may reflect either changes in the share of profits within companies' value-added, or changes in the scale of the company sector relative to the economy as a whole.[3] (These two factors are not independent; for instance, a weakening of profits may, through its impact on investment, reduce the relative size of the company sector.) Chart C shows, for the period since 1960, the contribution of these factors to changes in the share of real company profits in net domestic income.[4]

The gradual contraction of the relative size of the company sector until about 1970, and the sharper fall since—reflecting, *inter alia*, further nationalisation, growth of the non-trading public sector and, perhaps, feedback effects from weakening profitability—mean that the fall in the share of real company profits in net domestic income overstates the redistribution of companies' value-added at the expense of profits. If the company sector had remained as large as in 1960–64, the share of real profits would have been about 7% in 1977, over one percentage point above the actual level.

[1] Stock appreciation increased nearly five-fold between 1972 (when it represented 12% of gross trading profits and companies' rent) and 1974 (when it represented over 40%). Capital consumption at replacement cost more than doubled between 1973 and 1977; as a proportion of gross trading profits and rent, it rose from about 20% in the early 1960s to 35% in 1977.

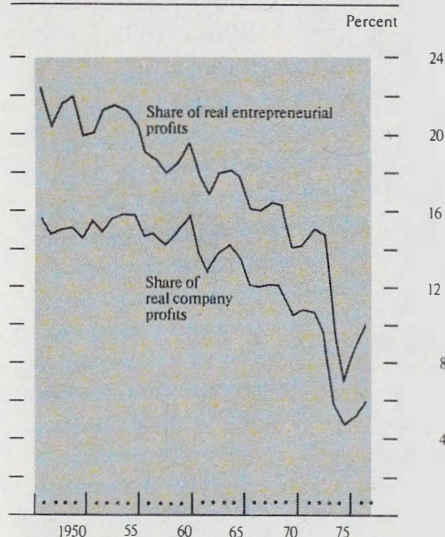
[2] Defined as company profits (including rent), the trading surpluses of public corporations and the estimated profit element of income from self-employment.

[3] The scale of the company sector, relative to the whole economy, is measured as the share of companies' value-added (net of stock appreciation and capital consumption at replacement cost) in net domestic income. A similar analysis could be presented for the entrepreneurial sector.

[4] Lack of data means that these series cannot be reliably extended over as long a period as can those based on 'total income'.

**Chart B**

### The shares of real entrepreneurial and real company profits in net domestic income 1946–1977<sup>[a]</sup>



[a] Defined in footnote [3] page 514, and footnote [2] below, respectively.

**Table B**

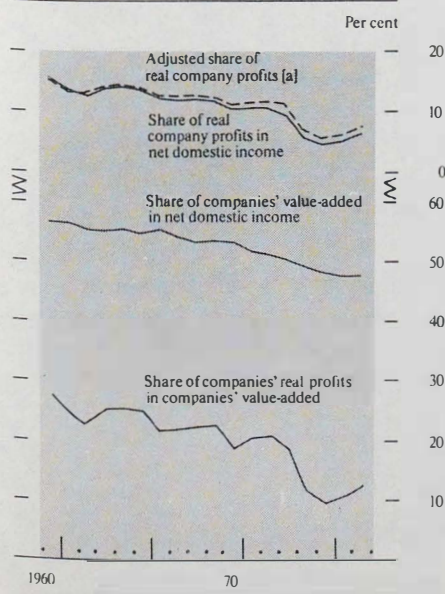
### Share of real entrepreneurial profits in net domestic income

Per cent	
1920s	22
1930s <sup>[a]</sup>	21
1950s	20
1960s	17½
1970–77	12

[a] Data for 1939–49 have been excluded because reliable figures for the period of the Second World War are not available

**Chart C**

### The share of real company profits in net domestic income, adjusted for changes in the relative scale of the company sector



[a] The share of real company profits in net domestic income if the share of companies' value-added in net domestic income had been at the average level of 1960–64.

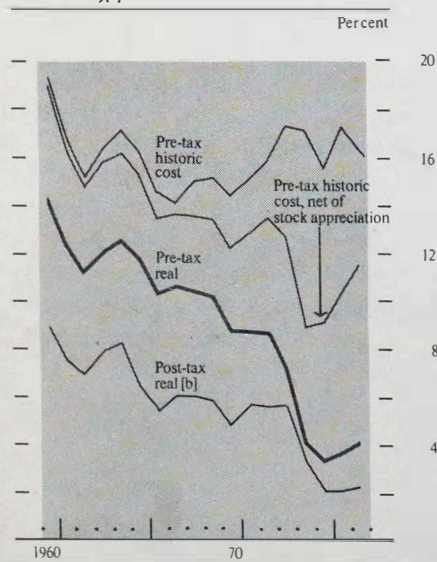
### Some influences on profitability

It is clear, therefore, that the share of real profits (however defined) has shown a fairly pronounced downward trend for some considerable time, and has fallen abruptly in recent years. A very simple model illustrating the effects of two important influences on the share of profits,[1] changes in capacity utilisation and in the rate of growth of costs, is set out in the appendix. The results of estimation using this model, though they should be treated with caution, suggest that these two factors explain a good deal of the short-term variation in profitability and, understandably, have been especially important in recent years. Moreover, the results also indicate a significant, and fairly strong, downward trend in profitability. This may reflect such factors as a growth in union bargaining power, a decline in the marginal product of capital as companies' capital/labour ratio rose, or increased competition. It may also reflect the persistence of price-setting policies which make inadequate allowance for the effects of inflation on the cost of fixed assets and the appropriate charge for depreciation.

**Table C**  
Industrial and commercial companies'  
rates of return on non-North Sea trading  
assets: national accounts estimates

Per cent	Pre-tax historic cost	Pre-tax historic cost, net of stock appreciation	Pre-tax real	Post-tax real	
				Backward-looking	Forward-looking
1960	19.3	18.9	14.2	8.9	10.6
1961	16.8	16.2	12.3	7.5	8.8
1962	15.2	14.7	11.2	6.9	8.3
1963	16.4	15.8	12.1	7.9	9.9
1964	17.1	16.2	12.5	8.2	10.0
1965	16.2	15.3	11.8	6.4	7.0
1966	14.5	13.4	10.3	5.4	5.7
1967	14.1	13.6	10.6	6.0	6.3
1968	15.0	13.5	10.4	6.0	5.9
1969	15.1	13.4	10.1	5.8	5.0
1970	14.4	12.2	8.7	4.9	4.1
1971	15.0	12.8	8.7	5.7	4.5
1972	15.8	13.5	8.6	5.6	5.0
1973	17.3	12.7	7.2	5.7	7.3
1974	17.1	8.9	4.0	3.3	4.1
1975	15.5	9.1	3.4	2.1	2.8
1976	17.3	10.4	3.6	2.1	2.8
1977	16.4	11.5	4.0	2.2	3.1

**Chart D**  
Industrial and commercial companies'  
rates of return (excluding North Sea  
activities)<sup>[a]</sup>



[a] Defined in the March 1976 *Bulletin*, page 36.  
[b] Backward-looking.

### Rates of return on trading assets

This section considers, first, trends in (both pre and post-tax) real rates of return on total trading assets, using national accounts data (as in the previous *Bulletin* articles), and then presents some estimates for real rates of return on total trading assets using companies' published accounts (which have been 'inflation-adjusted' by applying a method similar to that used by the Department of Industry and the Monopolies and Mergers Commission).[2]

### National accounts estimates

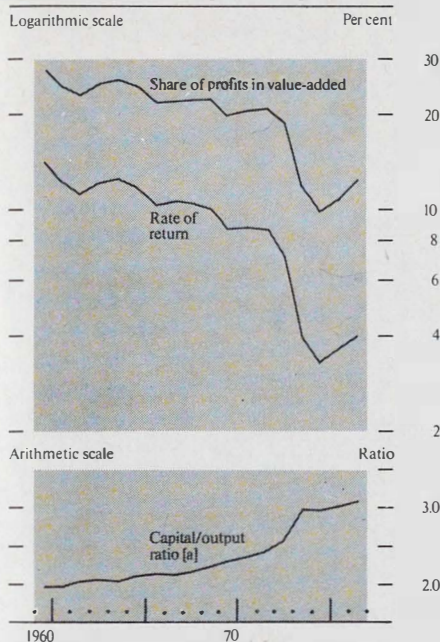
Table C and Chart D revise and update the estimates of rates of return presented in the June 1977 *Bulletin*. Rates of return are now shown excluding companies' North Sea activities—this adjustment reduces the real rate of return by about  $\frac{1}{2}\%$  in 1977, but has no significant effect in earlier years.

The steady decline in companies' real rates of return until 1973, and the abrupt fall since, have been noted in previous issues of the *Bulletin*. By 1975, the pre-tax real rate of return had fallen to less than  $3\frac{1}{2}\%$ . Its recovery to 4% in 1977 seems principally to have reflected the deceleration of cost inflation. The impact of the rise in cumulative inflation over the life of assets, which took place in the early 1970s—and the consequent widening of the gap between historic and replacement cost valuations of physical assets—is reflected in the growing divergence between the measures of rates of return based on historic cost profits (net of stock appreciation) and real profits. (In the 1960s, the replacement cost valuation of assets exceeded the historic cost by just over 30%, and in 1977 by nearly 150%.)

The backward-looking measure of the post-tax real rate of return[3] (estimated from an assessment of tax accruals rather than tax payments) fell between 1972 and 1975, but less abruptly than the pre-tax real rate of return because of the introduction of stock relief. It may have been little more than 2% in 1977.

- [1] Defined as the share of real entrepreneurial profits in the value-added of the entrepreneurial sector.  
[2] See, for example 'Companies' rate of return on capital employed 1960 to 1977' in *Trade and Industry*, 22nd September 1978, page 675. This updates estimates presented, initially, in an article by J. L. Walker, 'Estimating companies' rate of return on capital employed', in *Economic Trends*, November 1974 and in subsequent issues of *Trade and Industry*.  
[3] The backward-looking measure computes tax allowances by reference to those in force when the capital was installed, while the forward-looking measure computes tax allowances by reference to the present value of current investment inventives. Some uncertainty attaches to estimates of post-tax rates of return because tax accruals are estimated by assuming that tax allowances are fully usable in the year when they accrue. This has not been the case in recent years and, since the present value of tax allowances may be less when they are used, post-tax real rates of return may have been biased upwards.

**Chart E**  
The share of companies' real profits in value-added, the pre-tax real rate of return and the capital/output ratio



[a] Defined in footnote [2] below.

**Table D**  
Real rates of return on trading assets: company accounts estimates<sup>[a]</sup>

Year	Per cent	
	Pre-tax	Post-tax <sup>[b]</sup>
1960	13.3	7.3
1961	12.0	5.8
1962	11.3	5.6
1963	11.3	6.2
1964	12.4	6.8
1965	11.7	7.6
1966	10.3	5.1
1967	11.1	7.0
1968	10.8	5.5
1969	9.6	4.5
1970	7.7	3.5
1971	9.0	4.9
1972	10.4	6.6
1973	9.0	4.5
1974	3.8	-0.4
1975	4.0	1.1
1976	4.7	2.2

[a] For manufacturing, distribution and service industries the definitions used in calculating the rates of return in this table differ somewhat from those used in Table C. Further, depreciation in company accounts and, hence, the estimates of net fixed assets are based on the accounting lives of assets, which are typically shorter than the physical lives used to construct the net capital stock and capital consumption estimates in the national accounts.

[b] Constructed as a 'backward-looking' measure. Because of difficulties in interpreting the recording of deferred tax, the estimates should be regarded as giving no more than a broad indication of trends.

### Capital/output ratios

The path of the share of real profits in companies' value-added may diverge from that of the real rate of return to the extent that the capital/output ratio changes.<sup>[1]</sup> Companies' capital/output ratio<sup>[2]</sup> rose fairly steadily between the early 1960s and early 1970s (from about 2 to 2½). Although it is difficult to distinguish the respective impacts of 'capital deepening' investment<sup>[3]</sup> and the recession in pushing the capital/output ratio up to about 3 in 1975-77, the latter must have been at least partly responsible. These changes in the average capital/output ratio mean that the downward trend in the real rate of return on capital from 1960 to 1973 (Chart E), and the dramatic fall since, have been somewhat more marked than the decline in the share of real profits in companies' real value-added.

### Company accounts estimates

Another way of estimating real rates of return is to use company accounts. The aggregated accounts of over 1,000 large quoted companies are published in the Department of Industry's *Business Monitor*, *M3*, *Company Finance*, and the Department, in conjunction with the Monopolies Commission, have from time to time published figures for pre-tax real rates of return in certain individual industries and in the manufacturing sector as a whole.<sup>[4]</sup> These calculations have been repeated in the Bank (along broadly similar lines) for manufacturing, distribution and service industries taken together, a grouping which covers a wider range of activities and is therefore more nearly comparable with the industrial and commercial company sector of the national accounts. In addition, estimates of the post-tax real rate of return (consistent with the backward-looking post-tax real rate of return for industrial and commercial companies) have been made by deducting tax accruals (excluding that part of deferred tax accruals which arose from replacement investment) from pre-tax real earnings and excluding deferred tax from the measure of capital employed.

There are a number of reasons why estimated rates of return based on this source may differ from the national accounts estimates.<sup>[5]</sup> Nevertheless, the national accounts and company accounts estimates of pre and post-tax rates of return on total trading assets are strikingly similar in pattern (see Chart F). Both show a significant downward trend in profitability throughout the 1960s and a sharp decline since 1973. Moreover, while the cyclical fluctuations in the company accounts measures are somewhat more pronounced, the timing of the fluctuations is very much the same.

[1] Algebraically:

$$\frac{\pi}{O} = \frac{\pi}{K} \times \frac{K}{O}$$

where

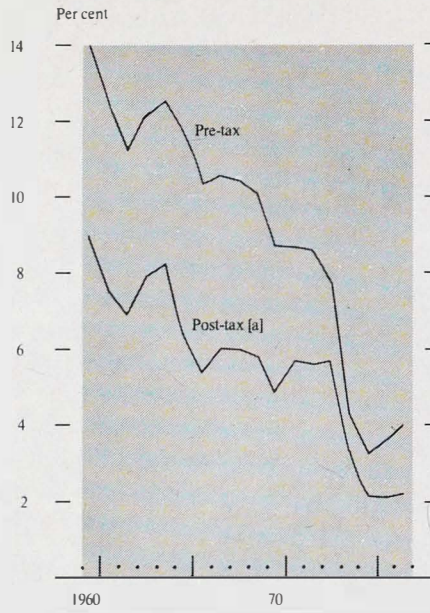
$\pi$  = real profits;  
 $O$  = companies' value-added (i.e. output); and  
 $K$  = capital base (net capital stock at replacement cost and the book value of stocks).

This identity implies that an increase in the capital-output ratio will be associated with a fall in the real rate of return relative to the share of real profits in value-added.

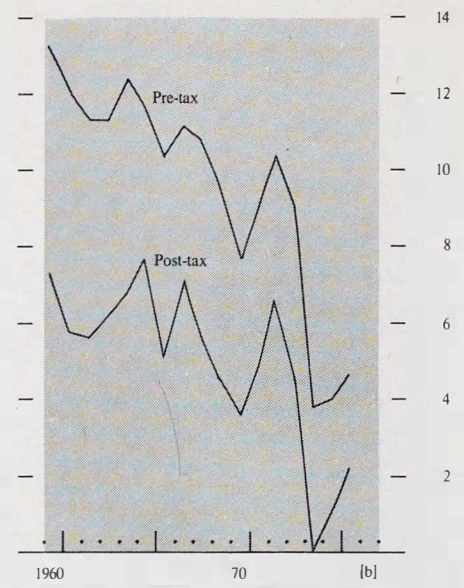
- [2] The net capital stock and the book value of stocks of non-North Sea industrial and commercial companies as a ratio of the sector's value-added.
- [3] That is, investment which leads to more capital-intensive methods of production. In contrast, 'capital-widening' investment represents an expansion of productive capacity utilising existing factor combinations.
- [4] See the articles referred to in footnote 2 on page 516.
- [5] First, the *Business Monitor* analysis covers only large listed companies, the trading results and financial position of which may not be representative of the sector as a whole. Furthermore, the coverage of the analysis is relatively weak in the distribution and services sector, which probably means the analysis for manufacturing, distribution and services is not as good an indicator of the position of industrial and commercial companies as is the manufacturing component of the analysis for manufacturing industry. Secondly, companies 'mainly' operating overseas are excluded but a significant element of overseas activity nevertheless remains from the overseas branches and subsidiaries of companies operating principally in the United Kingdom. Further, the UK activities of companies operating 'mainly' overseas—which, in some cases, are very substantial—are excluded. However, the extent to which the resulting rates of return are compromised as estimates of UK rates of return may not be great. Thirdly, the data relate to accounting years, and the figures shown for a given calendar year are those which finish between 6th April of that year and 5th April of the following year. In some contexts, this is not of great importance; and in any case, about 70% of listed companies' accounting years end in the fourth and first calendar quarters. But over the last five years, with high and rapidly changing rates of inflation, these timing differences have become more significant, particularly in calculating stock appreciation. In constructing the *Business Monitor* based series shown in Table D and Charts F, G and H, it has not been possible to make proper allowance for these timing effects, so that year-to-year movements in rates of return since 1972 should be interpreted with caution. This has probably not, however, distorted the trend.

**Chart F**  
**Pre-tax and post-tax real rates of return**

**1 Industrial and commercial companies**  
**(national accounts)**



**2 Manufacturing, distribution and services**  
**(company accounts)**



[a] Backward-looking.

[b] 1977 estimates are not available.

### Rates of return on the equity interest

All the measures of rates of return discussed above relate to the return on the whole of companies' trading assets, whether these assets are financed by equity or debt. For some purposes, however, this may not be the most familiar nor, perhaps, the most appropriate measure of profitability. Shareholders, in particular, are concerned principally with returns to the equity interest alone.

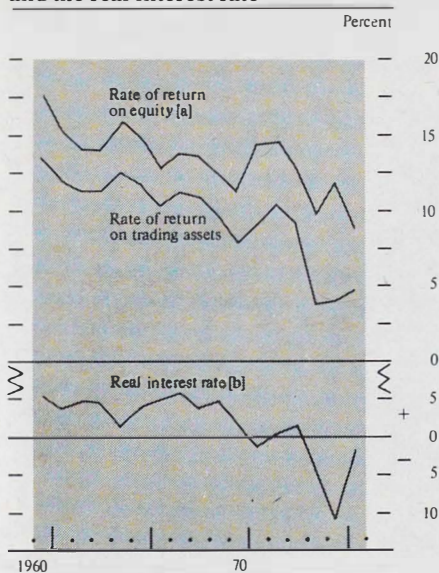
Derivation of the pre-tax real rate of return to the equity interest from the pre-tax real rate of return on trading assets involves three adjustments:

- the deduction from earnings of net interest payments (that is, the nominal return to the debt-holders);
- the addition of a 'gearing adjustment' to earnings to reflect the real capital gains which, at a time of inflation, accrue to the equity holders on that part of a company's physical assets financed by debt. There are a number of ways in which this adjustment might be made. The gain may be estimated most naturally, perhaps, as the increase in the money value of the geared (i.e. debt-financed) portion of physical assets (which is here called the 'natural' gearing adjustment, and is equivalent to the decline in the real value of a company's net monetary liabilities). But there are prudential grounds for calculating it—as suggested in the 'Hyde' guidelines[1] for companies with net monetary liabilities—as the geared portion of the stock appreciation and depreciation adjustments (the 'Hyde' gearing adjustment); and
- deduction from total trading assets of net monetary liabilities, to leave the equity interest in the business.

If 'ex post' real interest rates remain constant—that is, if nominal interest rates change in line with the 'general' rate of

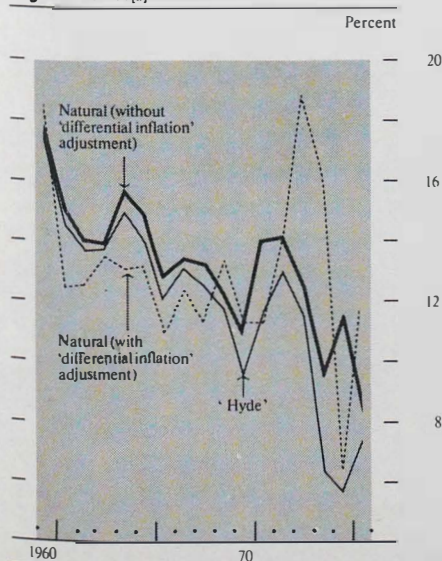
[1] *Inflation accounting—an interim recommendation by the Accounting Standards Committee, November 1977.*

**Chart G**  
**Real pre-tax rates of return on trading assets and on the equity interest, and the real interest rate**



[a] Incorporating a 'natural' gearing adjustment (without a 'differential inflation' adjustment).  
 [b] Clearing banks' average base rate + 2% (up to 1972: Bank rate + 2%) divided by percentage change in retail prices through the year.

**Chart H**  
**Real pre-tax rates of return on equity, incorporating different gearing adjustments<sup>[a]</sup>**



[a] The nature of the different gearing adjustments is outlined in the text.

inflation—changes in the gearing adjustment will be offset by changes in net interest charges. This cannot, however, be true of 'fixed-rate' borrowing; and even for 'floating rate' borrowing it is by no means fully consistent with the recent experience in the United Kingdom. In fact, with real interest rates substantially negative during the 1970s—in particular between 1974 and 1976 (see Chart G)—the gearing adjustment has tended to outweigh interest charges, leaving real 'equity' profits higher than real trading profits. At the same time, for most non-financial companies the capital base used in calculating the return to equity will be smaller—by the amount of net monetary liabilities—than total trading assets. For such companies, therefore, the expectation is that:

- the return to equity will 'normally' be higher than that to total trading assets by a factor reflecting aggregate capital gearing; but that
- this relationship will be modified whenever real interest rates change—the differential in favour of the return to equity rising when real interest rates fall.

In broad terms, these two characteristics are shown in Chart G which compares the pre-tax real rates of return on total trading assets and on equity (using the 'natural' gearing adjustment) in the manufacturing, distribution and services sector.

The discussion above has been concerned with the difference between two measures of real returns—on total assets and on the equity interest in those assets. However, most discussion of the gearing adjustment has arisen in moving between two measures of the return to equity: that at historic cost (the conventional 'profit' figure recorded in companies' accounts) and that in real terms. The 'Hyde' gearing adjustment ensures that (when prices are rising) 'adjusted' profits for a company with net monetary liabilities cannot be higher, and will almost always be lower, than recorded profits. If the 'natural' adjustment were adopted—based on the decline in the 'real' value of net monetary liabilities—the combined effect of the stock appreciation (cost of sales), depreciation and gearing adjustments would not be restricted in this way. In practice, however, even though the 'natural' gearing adjustment is more powerful than the 'Hyde' version in each of the years shown in Chart H, real equity profits calculated using the 'natural' adjustment remain, in each year, lower than equity profits as recorded in companies' accounts.

The case has been advanced for a second, 'differential inflation', adjustment to real earnings, both on total trading assets and on equity, to reflect an increase in the nominal value of physical assets beyond the 'general' rise in prices. The argument turns on the appropriate measure of 'income', and in particular of the capital gains which should properly be included with any revenue surplus. There can probably be no clear-cut resolution, but the effect of making the adjustment is shown in Chart H. As a practical point, the average divergence of the retail price index and a physical asset price index<sup>[1]</sup> over the seventeen years from the end of 1959 to the end of 1976 was only about 0.2% a year. Applying the 'differential inflation' adjustment is to some extent, therefore, a question of introducing timing effects and, since the accounts allocated to a given year in the *Business Monitor* do not relate precisely to that calendar year, the data are not really robust enough to sustain such adjustments.

It would clearly be desirable to extend the calculation of returns to equity so as to take account of taxation. There are,

[1] The physical asset price index referred to covers both fixed assets and stocks.

however, a number of difficulties in carrying through the calculations in practice (for example in ensuring a consistent treatment of the 'gearing adjustment' component of equity income and an appropriate treatment of deferred tax). Very tentative estimates, however, suggest that the post-tax real rate of return to equity has also declined sharply during the 1970s.

### **Conclusions**

The widely-reported weakening in real profitability on trading assets during the 1960s and early 1970s appears to have been a continuation of a much longer-term downward trend. This downward trend was accentuated in the mid-1970s by the recession and by more rapid cost inflation (especially when this was combined with historic cost pricing policies). There has also been some erosion of the return on the equity interest in UK companies, but this has been less marked in recent years than the fall in the return on trading assets because real interest rates became substantially negative; correspondingly, debt holders have suffered substantial capital losses.

The wider economic implications of a declining rate of return have not been explored in this article. However, work in the Bank, seeking to link financial factors with companies' real spending, suggests that a prolonged period of low profitability will have a significant effect on investment, but that the effect cannot properly be assessed without also considering changes in the cost of capital.[1]

[1] The fall in the post-tax real cost of capital during the 1960s was broadly in line with that of the post-tax real rate of return. As a result, pricing policies which led to a fall in profitability were not necessarily 'inappropriate' and the inducement to invest did not clearly weaken.



## Appendix

### Some influences on profitability

A number of theories (depending on, for instance, the growth of union bargaining power, intensification of foreign competition,[1] or a decline in the marginal product of capital)[2] have been advanced for the apparent downward trend in profitability. This appendix seeks to identify the strength of the 'underlying' downward trend, by first making allowance for the influence of capacity utilisation and cost inflation.

The approach is similar to that used by Feldstein and Summers,[3] in analysing US data, with the extension of making explicit the effect of changes in the rate of cost inflation under a régime of historic cost-plus price setting.

A very simple (historic) cost-plus pricing rule might specify that prices are set as a constant mark-up on past costs.[4]

$$P_t = (1 + \mu) \text{COST}_{t-1} \quad (1)$$

where:

$P$  = price per unit of output.  
 $\text{COST}$  = labour and raw material costs per unit.  
 $\mu$  = mark-up.

Historic cost gross trading profits, net of stock appreciation, per unit of output can be written:

$$(GTP - SA)_t = P_t - \text{COST}_t - \alpha \left( \frac{Y_t^*}{Y_t} \right) P_t \quad (2)$$

where:

$GTP$  = gross trading profits.  
 $SA$  = stock appreciation.  
 $\frac{Y_t^*}{Y_t}$  = potential output in relation to actual output.

The last term represents the allocation of overheads (other than depreciation), related to the potential rather than the actual level of output, to each unit of actual output. Then dividing by  $P_t$  and substituting from equation 1:

$$\left( \frac{GTP - SA}{P} \right)_t = 1 - \frac{1}{1 + \mu} \left( \frac{\text{COST}_t}{\text{COST}_{t-1}} \right) - \alpha \left( \frac{Y_t^*}{Y_t} \right) \quad (3)$$

$$= 1 - a_1 \left( \frac{\text{COST}_t}{\text{COST}_{t-1}} \right) - a_2 \text{RCU}_t \quad (4)$$

where,  $\text{RCU}_t$  = reciprocal of capacity utilisation index.

Equation 4 yields an equation for the share of entrepreneurial profits in that sector's value-added.[5] A time trend was included to test for the significance of a secular decline in the profits share. Equations were estimated for the share of entrepreneurial profits, net of stock appreciation, and for the share of real entrepreneurial profits in the corresponding measures[6] of value-added in the entrepreneurial sector. The results of estimation by autoregressive least squares,[7] using quarterly data, are presented in Table E.

**Table E**

#### 'Determinants' of profit shares [a]

	Dependent variable	Estimation period	Constant[b]	$\text{Time}_t$	$\text{RCU}_t$ [c]	$\left( \frac{\text{Cost}_t}{\text{Cost}_{t-1}} \right)$	$u_{t-1}$	$\bar{R}^2$
1.1	HSSA	1956 2nd quarter– 1973 4th quarter	1.0	–0.00037 <i>3.01</i>	–0.21 <i>3.58</i>	–0.49 <i>8.36</i>	0.35 <i>3.01</i>	0.38
1.2	HSSA	1956 2nd quarter– 1977 4th quarter	1.0	–0.00042 <i>4.30</i>	–0.20 <i>4.72</i>	–0.50 <i>11.52</i>	0.38 <i>3.66</i>	0.74
1.3	RS	1956 2nd quarter– 1973 4th quarter	1.0	–0.00078 <i>5.73</i>	–0.26 <i>4.13</i>	–0.51 <i>7.91</i>	0.34 <i>2.97</i>	0.62
1.4	RS	1956 2nd quarter– 1977 4th quarter	1.0	–0.00095 <i>7.34</i>	–0.28 <i>5.29</i>	–0.50 <i>9.05</i>	0.46 <i>4.53</i>	0.85

HSSA = share of entrepreneurial profits, net of stock appreciation.  
 RS = real entrepreneurial profits share.  
 $\text{Time}_t$  = 0 in 1970 1st quarter.  
 $\text{Cost}_t$  = a weighted average of labour and raw material costs.  
 $u_{t-1}$  = lagged error term.  
*t* statistics are shown in italics.

[a] Data sources: various issues of *National Income and Expenditure* and *Economic Trends*, Central Statistical Office, and *British Labour Statistics, Historical Abstract 1886–1968*, Department of Employment, 1971. All three publications are available from HM Stationery Office.

[b] Constrained at unity. Equations were also estimated with a freely determined constant term, but, at the 5% level, the coefficient was insignificantly different from unity.

[c] Defined as for equation 4. The capacity utilisation measure used was for manufacturing industry, and was derived from an estimated relationship between output and the gross capital stock.

[1] For example, Andrew Glyn and Bob Sutcliffe, *British capitalism, workers and the profits squeeze* (Penguin, Harmondsworth, 1972), and also Robert Bacon and Walter Eltis, *Britain's economic problem: too few producers* (Macmillan, London, 1976).

[2] For example, J. R. Sargent, 'Recent growth experience in the economy of the United Kingdom', *The Economic Journal*, Volume LXXVIII (1968), pages 19–42.

[3] Martin Feldstein and Lawrence Summers, 'Is the Rate of Profit Falling?', *Brookings Papers on Economic Activity*, Number 1, 1977, pages 211–28.

[4] Equation 1 was estimated using quarterly data, implying a stock/turnover period of one quarter and a similar period before prices respond to changes in costs. This is clearly a considerable oversimplification of the pricing mechanism, and is no doubt a source of the misspecification evident in the results.

[5] By scaling the numerator and the denominator by the real output of the entrepreneurial sector.

[6] These correspond, for the entrepreneurial sector, to the measure of the share of profits in companies' value-added shown in Chart C.

[7] Using a modified version of a program originally written by Professor D. F. Hendry (London School of Economics).

The results in Table E are statistically rather unsatisfactory, with significant first order autocorrelation indicating some serious misspecification.[1] The estimated coefficients should therefore be treated with caution. Otherwise, the main features are:

- significant coefficients on the cost and capacity terms in each equation, but rather better identified when the estimation period is extended to include the period 1974-77 than when terminated in 1973;[2] and
- a significant time trend in all cases implying a secular downward trend in the share of profits. The coefficient is larger over the longer time period, suggesting a sharper fall in the post-1973 period than that experienced earlier.

There appears to be a stronger downward trend in the 'real' share than in the corresponding 'net of stock appreciation' measure. This may reflect longer-term changes in the prices of capital goods, which affect the valuation of the capital stock and the appropriate charge for depreciation and which, under a slightly extended and probably more realistic version of the historic cost price-setting rule, can be expected to depress profitability. In the present specification, however, this effect is largely subsumed in the time trend.

The work by Feldstein and Summers,[3] concentrated on real rates of return rather than shares of profits in income. However, the simple model set out above more naturally yields an equation for shares, and the results for similar equations using the real rate of return as the dependent variable were less satisfactory statistically than those shown in Table E. Part of the reason for this is no doubt the failure of equations 2-4 to make explicit allowance for long-run changes in the capital/output ratio.[4]

The implication of the results presented in Table E is that most of the decline in the real share between the second half of 1973 and the second half of 1975 can be attributed to the impact of the recession, operating through the capacity utilisation term. The influence of accelerating costs in reducing profitability over this period was roughly equal to the effects of the downward time trend, but both were a good deal less important than declining capacity utilisation. The modest recovery since then can be attributed mainly to the slowdown in the rate of cost inflation.

While these factors have clearly also been important in the recent decline in the real rate of return, others (for example, an increase in the capital/output ratio) may have had as great an influence over the longer term. Moreover, while a pricing policy based on historic costs may appear inappropriate during a period of rapid inflation, companies may to some degree have been constrained in raising prices by intensifying competition and, during some periods, by official price controls.

[1] Higher order autocorrelation was not present.

[2] The coefficient on costs implies an implausibly high mark-up, probably a reflection of misspecification in the cost term used in the equations.

[3] See footnote [3] on the previous page.

[4] See footnote [1] on page 517.