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Critical examination of the various bases of asset valuation and their implications for income measurement

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A C R I T I C A L E X A M I N A T I O N
O F T H E V A R I O U S B A S E S O F
A S S E T V A L U A T I O N
A N D T H E I R I M P L I C A T I O N S F O R
I N C O M E M E A S U R E M E N T

RAYMOND KEIGHLEY ASHTON

Submitted for the Degree of
Doctor of Philosophy

LONDON GRADUATE SCHOOL OF BUSINESS STUDIES

A B S T R A C T

The scope and coverage of this thesis can be divided into two distinct parts. The first part examines and reviews the various alternative accounting systems which have been proposed in the literature and recognised as alternatives to HCA; the second part is a case study, based on the experience of Dutch companies who have implemented one of the alternative accounting systems - RCA. The literature survey shows that each of the alternative accounting systems has strengths and weaknesses but that RCA, or CCA as it is known in the UK, is the system which commands most support. However, very little is known about the use to which management will put this information or its effect on reported profit.

In the chapters dealing with the Dutch experience the Dutch literature was examined to see how similar or otherwise their system of RVA is to CCA. It was found that the original theory implicitly assumes identical replacement but that in practice the system is very similar to CCA. The replies to the questionnaire that was sent to companies participating in the survey showed that:-

- i) RC rates were used to evaluate divisional and group performance;
- ii) RCs were used in the compilation of budgets and standard costs;
- iii) the accuracy of the RC data was open to question because of the lack of available and reliable indices;
- iv) very little account was taken of technological change and changes in a firm's product-mix.

In the chapter which examined the effect of RCA on reported profit it was shown that the effect on individual companies varied substantially. The effect of RCA on five ratios was also examined. With the exception of the dividend cover there was very little change in the rankings of the ratios when these were compared on a HC and RC basis. The last relationship that was examined was between each company's share price on three different dates, and shareholders' funds on both bases. It was found that the null hypothesis of no difference between the various combinations could not be rejected. The results of this survey have formed the basis of a larger project, now underway, into the use and effect of RCA on companies in the United Kingdom.

TO SUSAN, MARK AND NEIL

WHO I LOVE DEARLY

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FOREWORD

Obviously all writers of doctoral theses owe much to other people. I am no exception. I would like to especially thank J. Leeuwerik of the Netherlands Instituut van Register Accountants who has given very generously of his time. I would also like to thank two of my colleagues for all the help and guidance they have given me in my academic career to date, Dr. M. J. Barron and Dr. D. W. Targett. Both have also given generously of their time and are a continuing source of encouragement. I would also like to thank Miss Gaye Gresham who has typed this thesis at very short notice and under considerable pressure.

Finally I would like to thank two footballing friends, Terry Venables and Malcolm Allison, for taking my mind away from my hectic academic and business life.

Raymond Ashton

November 1979

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P R E L I M I N A R Y C O N S I D E R A T I O N S

1. Introduction
2. Sandilands and the use of Replacement
Cost information
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1. INTRODUCTION

The idea for this thesis came when the writer was working as a Senior Research Officer for Professor Walter Reid and preparing material for him in connection with his duties as a member of the Government sponsored Sandilands Committee.¹ At a very early stage in my research duties it became very clear that it would be extremely difficult to write a theoretical thesis as a vast amount of literature was already in existence. However, what was not in existence, was very much empirical evidence about the various suggested systems of income measurement and asset valuation. It is to this problem that the writer directed his attention.

As a result of the combined efforts of Sandilands, the Inflation Accounting Steering Group² and the Accounting Standards Committee³ most of the larger companies will soon have to publish some form of current cost information in their annual reports. The introduction of some form of current cost accounts (hereafter referred to as CCA) has proved, as most people in the financial world expected, to be very controversial. Whilst most people have accepted the need for CCA the precise form has still to be decided. Although such considerations are very important very little attention has been paid to such questions as:- .

- a) the use of CCA in decision making and performance evaluation;
- b) the extent to which such information will be used by the various user groups;
- c) the various methods and problems of estimating replacement costs (current costs);

- d) the extent to which CCA will affect reported profits and the rankings (in terms of return on equity etc) of companies.

With the exception of (d) these questions were examined, though with little rigorous analysis, by the Sandilands Committee.⁴ They considered these questions under eight major headings, they were:-

1. Resource allocation and investment decisions
2. Investment in net assets
3. Return on capital employed
4. Pricing
5. Dividends
6. Sources of funds
7. Wages and salaries
8. Efficient allocation of resources through the Capital Market

Obviously some of these are related. Furthermore these eight headings are really particular instances of (a) and (b). The questions raised by (c) concern the accuracy of the CCA figures. The Committee's views on the use of CCA in the context of decisions relating to the above headings 1 to 7 are considered briefly below.

2. SANDILANDS AND THE USE OF RC INFORMATION

2.1 Resource allocation and investment decisions

Sandilands recognised that CCA was not relevant to decisions regarding new investment projects, but argued that in relation to existing projects an accounting information system should show the relative profitability of each activity

on a basis useful to management. A laudable objective. The introduction of CCA, no doubt in common with a number of other accounting systems, would provide useful information by:-

- i) indicating the extent to which the returns on a particular project consisted of holding gains;
- ii) indicating to management that a particular project, whilst currently profitable, will not continue to be profitable when the existing assets are either retired or exhausted;
- iii) providing information useful to management in appraising divisional performance, in particular by the segregation of operating profit from holding gains;
- iv) removing the distortions of HC profit. By not segregating holding gains the trend of profits may not be indicative of operating performance.

Drake and Dopuch ⁵ show that the dichotomy between holding gains and operating profits can be arbitrary and so the reporting of holding gains may introduce new distortions. The distinction also depends on the view you take of the company. If you take the voyage approach and consider each investment as a voyage the distinction is artificial, as the business may or may not continue in the future. On the other hand if a going concern view is taken, for want of a better term, the distinction becomes more meaningful. The answer as to which view should prevail is a normative one and inevitably a 'political solution' will prevail.

2.2 Investment in net assets

Management, it was argued, needs to know:-

- i) the amount and relative size of the investment it has made in the various assets under its control;
- ii) the extent to which these are financed by short and long term funds.

HC does not show the 'value to the business' of a company's assets and so gives little indication of the current value of the resources it controls. By showing assets at their 'value to the business' the accounts may indicate to management/shareholders that their investment is excessive in relation to the results being achieved. In this context it should be pointed out that in any evaluation of performance, whether ex-ante or ex-post, the resale value of the assets controlled by management is also relevant as it indicates the opportunity cost of investing in those assets.

2.3 Return on capital employed

CCA would be more useful for analysing performance. It was ascertained that the CCA figures would be of considerable benefit and in particular, to the extent that management was unaware of the impact of changing prices, it would lead to decisions aimed at securing better returns. Presumably, one might add to this, whether the business should continue to produce the product or whether investment should be channelled into other products. Unfortunately the report does not tell us what further benefits might accrue from the adoption of CCA. Such an oversight is unfortunate in that it makes the proposition so difficult, if not impossible, to verify empirically.

2.4 Pricing

Where prices are estimated on a cost plus basis it was asserted that CCA would provide more useful information. It might also lead to pricing oneself out of the market. Surely prices should reflect historical costs and not some hypothetical cost?

2.5 Dividends

Sandilands suspected that a number of companies, by not incorporating CCA adjustments in their accounts, were making capital distributions. It was argued that some directors were not aware of this and that some had recommended distributions they would not have made had they known the facts. Businessmen, unlike accountants, have been dealing with the effects of inflation for many years. The assertion made by Sandilands amounts to saying some businessmen are idiots - a difficult proposition to test. Sandilands asserted that CCA could lead to reduced dividends which in the long run could be beneficial. This proposition is easy to make but much more difficult to substantiate.

2.6 Sources of funds

The Committee thought many companies were over-g geared; this had arisen because of the perceived advantages of borrowing in a period of inflation. CCA by not recognising 'purchasing power gains' would not mislead management. To this extent yes, in another way no. CCA inevitably reduces a company's gearing ratio; it could lead them to borrow additional sums and as a result, possibly overcommit themselves.

3. RESEARCH PROGRAMME AND THE THESIS FORMAT

The research was directed towards answering some of the questions raised by points (a) to (d) above. The research methodology followed is set out below. As very few English companies published some form of CCA information when the research was first started it was decided to use as a case study companies who publish some form of RCA in the Netherlands. The case study approach was used because it transpired that only a few companies actually publish some form of RCA information. Management was selected as the user group because the Institutional Market is not as developed as in the UK and most companies are predominantly equity financed. It was decided to send a questionnaire to companies publishing some form of RCA to ascertain the precise use they made of the RCA information and to ascertain the methods used to assess replacement values. The reasons for asking the latter questions was to get some idea of the accuracy and reliability of the data as it is self-evident that inaccurate and unreliable data could be counter-productive. From this survey it was hoped that some insight would be provided to the questions and issues raised under headings 1 to 8 above. The section which examines the effect of RCA on reported profits and the rankings of the survey companies will also examine

- i) their financial characteristics; and
- ii) the relationships between shareholders' funds and stock market prices.

Having briefly reviewed the questions to which this thesis will be directed and the research methodology which will be followed the next section will consider the organisation of the thesis.

The literature review will focus on the five main accounting systems which have been proposed in the literature as alternatives to HCA. These are:-

Replacement cost accounting

Current purchasing power accounting

Continuously contemporary accounting

Cash flow accounting

Present value accounting

Some of the alternatives such as:-

Flow of funds ⁶

'Events' ⁷

RCA and CPP combined (although this will be referred to in the chapter which examines the work of Edwards and Bell)

Maintenance of the company's investment purchasing power ⁸

are not reviewed here. These systems have not been sufficiently recognised in the literature or by the professional bodies ⁹ and Government Committees such as Sandilands ¹⁰, as being practical alternatives to HCA.

The thesis will not consider in detail the issues raised by measurement theory ¹¹, the information needs of the various user groups and the relative ability of different measurement models to satisfy these needs, ¹² nor the extent to which debt financed holding gains are distributable. ¹³ The reason why only passing references will be made to the first two, measurement theory and the ability of measurement models to satisfy users' needs, is that this thesis is concerned with what data is used by management and the effect on reported

profits of using such data. It is not concerned with the theoretical issue of whether the requirements of measurement theory have been satisfied, or with whether the RC model is able to satisfy the information needs of the users. It will be assumed that if people in companies use RC information they must find it relevant and useful for the purpose for which they use it. In relation to the issue of whether holding gains are distributable this question was not addressed because:-

- i) it is strictly not part of the theory and practice of Dutch RCA;
- ii) the Dutch capital market is not as developed as in the UK and companies have to finance large projects from mainly internal sources of finance.

This approach is also consistent with the views of the Sandilands Committee. Gynther¹⁴ argued convincingly that it is only necessary to make an adjustment in respect of net monetary assets or liabilities. However, as this is a controversial issue which has not yet been resolved in terms of the practical implementation of CCA it was decided that this view was not unreasonable.

Chapters 2 to 6 will consider the alternatives to HCA. Chapter 7 will describe the background to the reporting of replacement values in the Netherlands and in particular the contribution of Limperg and Burgert. Chapter 8 will describe the accounting policies of companies included in the survey and the results of the questionnaire. Chapter 9 will report and discuss the statistical findings.

Chapter 10 will conclude by discussing the main findings of this thesis and the areas where further empirical research is needed.

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2

H I S T O R I C C O S T A C C O U N T I N G (H C A)

A N D C U R R E N T P U R C H A S I N G

P O W E R A C C O U N T I N G (C P P)

1. Introduction
 2. Limitations of Historic Cost Accounting
 3. Current Purchasing Power Accounting
 4. Advantages and disadvantages of CPP
Accounting
 5. Conclusions
- References

1. INTRODUCTION

It is noticeable that as the pace of inflation quickens the clamours for some form of inflation accounting increase. This type of assertion implicitly assumes that HCA is inadequate for the needs of the various users in periods of inflation. Section 2 addresses this question by examining the deficiencies of HCA in an inflationary environment. Section 3 describes the main features of current purchasing power (CPP) accounting, a price-level adjusted HC system. Section 4 will discuss the main advantages and disadvantages which have been claimed for the system. Section 5 will conclude the chapter by reviewing the main discussion points of the previous sections.

2. LIMITATIONS OF HCA

2.1 Deficiencies of HCA

Most people would agree with the assertion that when prices are stable HCA provides a satisfactory basis for evaluation an organisation's performance. However, when prices are changing the usefulness and relevance of HCA information is more open to question. In particular it is argued that:-

- i) fixed asset values in the balance sheet are too low and this implies that the charge for depreciation will be insufficient to fund replacement of those assets;
- ii) 'stock profits', that is, the difference between the acquisition cost of stock and its RC at the date of sale, are included in profits;

- iii) the burden of debt, to the extent that it is not reflected in higher interest charges, declines; while the interest charge appears in the accounts the gain on the debt does not;
- iv) holders of cash and other monetary assets lose command over resources but this is not reflected in the accounts;
- v) apparent growth trends in sales, profits, etc are overstated because no allowance is made for changes in the purchasing power of money.

It is then argued that unless accounts are adjusted to take these limitations into account it will be extremely difficult, in a period of rapid price inflation, to assess the performance of a business. In particular comparisons of:-

- i) firms within an industry,
- ii) how a firm has performed over time.

Whilst HCA has these defects they do represent to a large extent the actual costs that have been incurred by the business. To this extent they are objective and to a large extent limit the number of judgements that have to be made in the preparation of final accounts. It should be pointed out that Chambers ¹ and other academic accountants have put forward the view that even under a historical cost accounting system a substantial number of judgements still have to be made. It is a fact that the number of judgements involved in preparing historical cost accounts are considerably smaller than under the alternative accounting systems such as CPP and RC accounting.

It is necessary to examine the extent of these deficiencies before assessing whether account should be taken of them. In this section of the chapter, two of the above deficiencies will be discussed - depreciation and 'stock profits'. Later in the chapter the other deficiencies will be discussed.

2.2 Depreciation

It was stated above that the depreciation provisions would be insufficient to fund the replacement of fixed assets. Surely this depends on the following factors?

- i) the rate of return being earned by the firm on the sums set aside for depreciation;
- ii) the physical growth rate of the asset category.

If the firm is expanding the depreciation charge will be increasing and will be available to replace worn out assets acquired in earlier years.

It is by no means clear that the depreciation provisions will be inadequate to finance replacement of existing machinery.

Even if it is accepted that depreciation is inadequate, so what? In developed economies with reasonably efficient markets a profitable project will not want for lack of finance. As a result it does not matter whether a firm has sufficient assets to finance replacement if the project is sufficiently profitable.

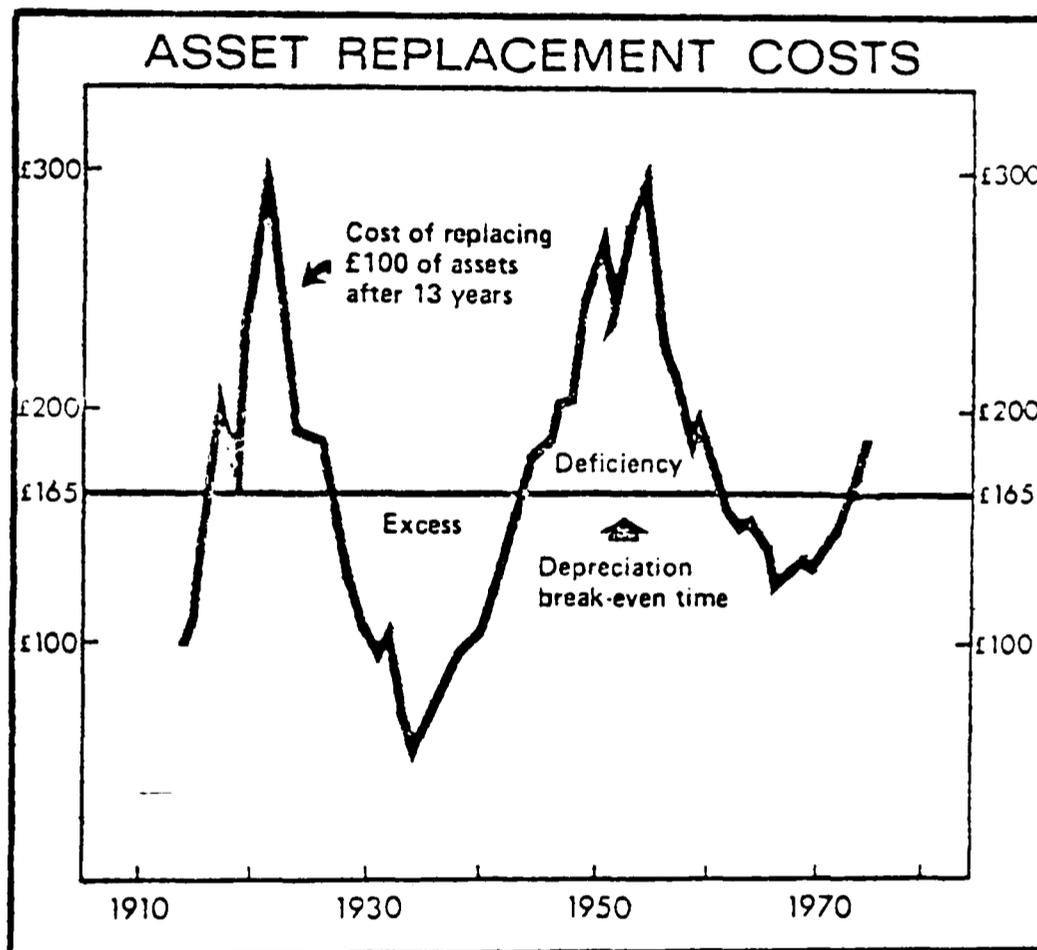
In relation to (i), if the following assumptions are made:-²

- i) that the asset has a thirteen year life - this is the average life of fixed assets in this century;

- ii) that over the life of the asset the straight-line depreciation provisions are reinvested at 8% net of tax;
- iii) that over the life of the asset its price increases at a compound rate of 4% per annum.

Chart 1 illustrates the price history of capital goods and shows that for most of this century depreciation provisions invested at such a rate would have been sufficient to fund replacement.

CHART 1



Whilst these figures are highly aggregated and mask the differential effects of fixed asset costs amongst firms, they do highlight the point that 'the depreciation problem' is not as great as some writers have suggested. ³

2.3 'Stock Profits'

Where the stock turnover is very rapid there will be

very little difference between acquisition cost and replacement cost. Substantial differences usually only occur when there is a marked lead time between acquisition and disposal, as is the case with certain types of work-in-progress.

The Sandilands Committee ⁴ thought that no adjustment to the cost of sales figure would be necessary if the rate of stock turnover was in excess of four, ie less than three months.

This suggests that because of the nature of the production process the magnitude of 'stock profits' will vary considerably. For supermarkets they are likely to be small and for heavy engineering (with a long lead time) substantial. Table 1 shows that even when inflation rates are modest, 5.4%, the stock appreciation or depreciation element is not insignificant at 11.3%. Sandilands ⁵ estimated that 'stock profits' amounted to 50% of profits in 1974, when the inflation rate was in excess of 20%.

The implications of this analysis are:-

- i) the incidence of 'stock profits' varies between businesses and depends on the nature of their productive process;
- ii) even when inflation rates are modest, the 'stock profits' element of those businesses affected can be substantial.

It follows from (i) and (ii) that the need for an adjustment to reflect 'stock profits' is greater in some industries than others.

TABLE 1

PROFITS, STOCK APPRECIATION AND PRICES

<u>YEAR</u>	<u>GROSS TRADING PROFITS (1)(2)</u>	<u>STOCK APPRECIATION/DEPRECIATION</u>	<u>STOCK APPRECIATION/DEPRECIATION AS A SHARE OF GROSS TRADING PROFITS</u>	<u>PERCENTAGE CHANGE IN RETAIL PRICES</u>
	£ million	£ million	%	%
1966	4610	-293	6.4	3.9
1967	4663	-151	3.2	2.5
1968	5275	-458	8.7	4.7
1969	5143	-583	11.3	5.4
1970	5279	-884	16.7	6.4
1971	5756	-834	14.5	9.4
1972	6584	-1057	16.1	7.1

(1) Before providing for stock appreciation and depreciation

(2) Including United Kingdom branches and subsidiaries of non-resident parent companies

SOURCE National Incomes and Expenditure Blue Book. Central Statistical Office

3. CURRENT PURCHASING POWER (CPP) ACCOUNTING

To overcome the difficulties of HCA and yet retain its advantages it has been suggested ⁶ that the HC figures should be adjusted by a general index. This would have the effect of converting the pounds of many different periods into pounds of a uniform general purchasing power ie it would remove the distortion attributable to changes in the general price level.

The main features of this system are set out below.

1. Each item in the profit and loss accounts is adjusted by the average change in the general price level for the year.
2. A distinction is drawn between monetary and non-monetary items, the former are obligations which remain fixed in monetary terms. These items, whilst affected in real terms by price level changes, remain unaltered in nominal terms. In times of rising prices borrowers gain at the expense of lenders, since the real value of the debt declines. If during an accounting period a company has an excess of monetary liabilities over monetary assets, there will be a gain to the equity shareholders if the price level rises. Examples of monetary items are cash, debtors and creditors.
3. Non-monetary items are regarded as items of wealth, such as fixed assets and stock. These items, so it has been argued, ⁷ are not at

monetary risk so there is neither a gain nor a loss in purchasing power by reason only of changes in the general price level.

4. When converting the historical cost accounts into current purchasing power terms for the supplementary statement, the monetary items in the balance sheet remain the same. With respect to the non-monetary items, these are increased in proportion to the amount of inflation since their acquisition or revaluation. The converse would be applied in times of deflation.
5. The owners' equity is adjusted by changes in the general price level and so the reported CPP profit figure is the profit after maintaining the purchasing power of the owners' equity intact.

This section would not be complete without some discussion of the treatment of the gain on long-term debt. CPP accounting has been supported by the professional bodies of accountants in the United States and United Kingdom.⁸ The provisional Accounting Standard in the UK recommended that the gain on long-term borrowings should be treated as part of the profit figure available for distribution. This treatment was justified on the grounds that the interest charge in the accounts is proportionately higher during periods of inflation. This is because lenders will require an amount to compensate them for the capital depreciation they will suffer. Since the full cost of borrowing is written off in the profit statement, if the above argument is accepted, it is logical to include the monetary gain on long-term monetary liabilities in

the profit figure. This recommendation was fiercely criticised in both business and academic circles.⁹ Businessmen argued that the gain was unrealised and should not be included in profit.¹⁰ The most cogent of the academic arguments was that put forward by Gynther.¹¹

'So called gains on long-term borrowing in times of rising prices do not constitute a profit to the entity itself and should not be included in profit determination - even in supplementary financial statements.'

He took the view that such gains accrue to equity owners at the expense of debt owners and should be reflected in the relevant prices of securities on the stock market. Such gains were irrelevant for corporate reporting, which should be concerned with the affairs of the company as a separate entity and not with the affairs of the shareholders.

'To endeavour to account for shareholders within the company's accounting system produces a confused hybrid from which misleading financial reports can flow.'¹²

Support for the provisional Standard's view has recently been advanced by Kaplan¹³ who developed a model based on interest rates which incorporated expected rates of inflation ie the Fisher effect. This model showed that much of the apparent purchasing power gain on debt is due not to real purchasing power gains but to gains associated with the reduction in the market value of debt because of unanticipated inflation. When changes in the market value of outstanding debt were explicitly recognised, a significant part of the

purchasing power gain on debt could be viewed as an offset to the nominal interest charge to arrive at the real interest expense.

4. ADVANTAGES AND DISADVANTAGES OF CPP ACCOUNTING

4.1 Arguments in favour

1. It removes the distortions to conventional accounts caused by inflation.¹⁴
2. By investing in a business the investor foregoes consumption opportunities in the hope of obtaining greater consumption opportunities at a later date, by either selling his shares or liquidating the business.¹⁵ This implies that the investor, at periodic intervals, will want to know the amount of consumption possibilities, in the form of income, that the firm has generated in order to monitor the progress of his investment. If accounts are drawn up in money terms no account is taken of changes in its value as a result of changes in the general level of prices. Adjusting the accounts by an index which represents these changes removes this distortion.
3. By using an externally imposed index CPP accounting is more objective than other systems, such as RCA, which use specific indices and give more scope to those managements who wish to manipulate their results.
4. Simplicity and cost: CPP, unlike RCA, only uses one index to adjust stock and fixed assets.

5. Inflation adjustments remove from historical cost accounts the potential to increase the extremes of the trade cycle. ¹⁶
6. An advantage claimed by the professional bodies is that CPP calculations can be independently verified by auditors once an agreement is reached on the general index to be used.
7. The use of CPP accounts as a tax base would remove from the tax charge the monetary profit which is recorded in historical cost accounts solely as a result of inflation. Tax would be charged only on the real profits and hence real earning power would not be impaired.¹⁷
8. CPP accounting does not require any assumptions about the way in which the resources of the business are to be spent. This view is based on the claim that replacement cost accounting necessarily requires assumptions to be made about how assets will ultimately be replaced. Advocates of replacement cost accounting do not accept this view. Replacement costs are viewed as a measure of the current cost of acquiring resources and are not the costs of ultimately replacing those resources. ¹⁸

4.2 Arguments against CPP

1. CPP accounts add unnecessary complexity to financial reporting, and may confuse users. It may be preferable to have a relatively simple set of figures

which have been prepared in a way that most people understand. ¹⁹

2. It is doubtful what significance can be attached to the non-monetary asset figures in the balance sheet, such as stock and fixed assets. These figures will represent historical cost adjusted for changes in the price level since the assets were acquired. Where there have been changes in the general price level, it will only be by chance that the restated figures in the balance sheet will represent either the replacement cost or the net worth to the business.
3. It is difficult to explain the meaning of the numbers attached to asset values in CPP accounts, particularly to non-accountants. The figures represent neither the amount that was paid in money nor the current value of the item. This argument was advanced by Stickney and Green ²⁰:
'... users might be confused as to the meaning of the adjusted statements.' They do admit, however, that 'An educational program could help.'
4. CPP accounts do not show the amount that a business can distribute to its owners without depleting its operating capacity. It may still be necessary to set aside a reserve for the increased cost of replacement. ²¹ Accordingly, there is a danger that companies may pay dividends at levels which deplete operating capacity without a full appreciation of the implications of their action. ²²

5. Users do not believe that information in units of general purchasing power would be more helpful than information in units of money. The results of several surveys ²³ support this view. However, those who participated had not had extensive experience with the use of general purchasing power information, and it is a matter of speculation what their responses would have been if they had.
6. Changing to units of general purchasing power does not make any difference to the rankings of companies. ²⁴
7. People are interested in information in terms of money, not general purchasing power units. Revsine and Weygandt ²⁵ implied agreement citing 'the objective of cash flow projection ...' in rejecting general purchasing power information.
8. General price level indices are not sufficiently reliable. In the US, Stickney and Green found: 'substantial uncertainty regarding the accuracy and reliability of the price indices seems warranted.'

5. CONCLUSIONS

It is clear from this review that HCA is deficient in periods of rising prices. However, the need for some alternative system does not necessarily arise from the inadequacy of HC depreciation, or the increased cost of replacing stock, rather it must stem from the failure of the HC figures to provide users with reliable information about

past managerial performance. This it clearly fails to do. The strengths of CPP are that it retains the objectivity inherent in HCA and is relatively simple to produce. Its weaknesses greatly over-shadow its strengths. Perhaps the most serious deficiency is the lack of significance which can be attached to the restated figures for non-monetary assets. The other major weakness is the potential confusion that could arise in connection with the unit of account. CPP uses purchasing power units whereas society still uses money units. It is not surprising that CPP has been rejected as an inflation accounting system by three English speaking Government sponsored committees. ²⁶

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3

E C O N O M I C C O N C E P T S O F
I N C O M E A N D C A P I T A L A N D
P R E S E N T V A L U E A C C O U N T I N G

1. Introduction
 2. Economic concepts of Income and Capital
 3. Present value accounting
 4. Conclusions
- References

1. INTRODUCTION

In this chapter the economic concepts of income and capital will be discussed. This will provide a reference point for evaluating the suggestion that has been made in the literature that the annual accounts should be based exclusively on expected present values. In Section Two of this chapter the economic concepts of income and capital will be described and reviewed. In the third Section the practicalities of reporting expected present values will be examined. Section Four will conclude by briefly reviewing the main discussion points of the previous two sections.

2. ECONOMIC CONCEPTS OF INCOME AND CAPITAL¹

2.1 The Classical Economists

The concept of income has been a focus point of economic analysis ever since the birth of the subject as an academic discipline. Adam Smith² in his classic treatise wrote extensively about the nature of capital and the need for calculating the expense of maintaining capital before arriving at net revenue. He defined net revenue as the stock of wealth which can be consumed without encroaching upon capital. This approach to defining income as the gain in wealth, as the surplus after maintaining capital intact, established the approach for the writings of later economists. This all-inclusive concept of income stresses the notion of income as the gain in wealth after maintaining capital intact. Subsequent classical writers added very little to the ideas developed by Smith. For example, Marshall was content to follow Smith and felt that economists had no choice but to

follow well-established business customs.³ He stated that business income was found by deducting from gross revenue the outgoings that belong to its production. The classicists, however, did not have an entirely clear concept of income in mind and their discussions, as can be seen from Marshall's comments, tended to be confused by the pragmatic practices of business.

2.2 Irving Fisher

The main theoretical contribution to the notion of income dates from the work of Fisher⁴, who sought to develop a concept that was free from ambiguity and capable of measurement. As we shall see his notion of income, which he developed as part of a theory of interest rates, bore very little resemblance to the notion in everyday use. Fisher⁵ thought of capital as 'a stock of wealth existing at a given instant of time'. His idea of income as a flow concept was developed in terms of events. In the first instance these events were not financial but psychic. Financial transactions merely preceded final human enjoyment and Fisher concludes that 'It is only what we carry out into our homes and private lives which really counts. Money is of no use until it is spent. The ultimate wages are not paid in terms of money but in the enjoyment it buys. The dividend cheque becomes income in the ultimate sense only when we eat the food, wear the clothes, or ride in the automobile which are bought with the cheque.'⁶ Although Fisher's concept of income is based on consumption, it is not measured by reference to the amount of money spent during the period on durable or non-durable goods but the amount of money spent

on the services actually consumed or enjoyed during the period. Fisher's concept of income is effectively equivalent to the monetary value of the amount of services consumed during a period. Kaldor ⁷ has pointed out that whilst Fisher's approach has the virtue of being simple and unambiguous it does not accord with the everyday notion of income as such it only solves the problem by eliminating it. A further problem raised by defining income in terms of consumption services is that another term would be required for what otherwise would be called income and the problem would still remain as to how to define the latter.

2.3 Lindahl

Fisher's concept of income and capital has been developed by a Swedish economist Lindahl. ⁸ From the notion that income is a flow of wealth through time, Lindahl showed that it was possible to look on income as a continuous appreciation in the value of capital goods due to the time factor. Income can be regarded as the product of the capital value existing at the start of the period and the ruling interest rate during the period. This appreciation arises because the discounted services come nearer and nearer in time. The rate of interest therefore measures the rate at which the value of capital goods increases through time.

If future events could be accurately foreseen and uncertainty was absent, income could be inferred from market prices. This is because the undermentioned conditions ⁹ would prevail.

1. A single interest rate that could be used to discount the future net income streams accruing

- to all capital goods.
2. At any one point in time the value of these capital goods could be ascertained by computing their present value.
 3. Differences in present value would be attributable to the discount factor: where necessary an appropriate adjustment would have to be made for withdrawals during the period.
 4. The rate of interest would measure the rate at which the stock of capital goods would increase over time if none of the benefits which accrued from these goods were utilized for personal consumption.

In the real world these idyllic conditions do not prevail and so income ceases to be objectively measurable. In addition account must be taken of.

1. At any point in time there are many rates of interest. Rates, for instance, differ according to term structure because of the uncertainty as to future rates. Further adjustments are needed to take account of lenders' and borrowers' risk profiles. From this it must be deduced that each asset category will have a different market rate of interest attached to it. This is not necessarily the case; the market value of an asset is the product of its expected future returns and the discount factor applied to these returns. As a result, to find the discount factor it is necessary to know the future net income stream which underlies the market value. Comparison between asset yields becomes dangerous as it is not possible, for instance, to quantify differences in

yield due to such things as risk and uncertainty.

Even if the correct market rate of interest applicable to each asset could be found, income defined as the product of an asset's interest rate and its market value would no longer be adequate as a measure of the psychic income to their owners, relative to their money return, than assets with a high yield but with a large risk element.

2. The concept of income as interest over a period on an asset's capital value at a particular point in time is an ex-ante concept of income, or put in another way, it can be thought of as the income expected for the coming 'period'. For the reasons listed below the income actually realised over this period can differ. Before listing these reasons it is necessary to explain the notation that will be used: the letter (t) stands for time and the subscript relates to the period covered:
- i) if the actual returns in (t_1) were greater or less than expected returns;
 - ii) if expectations concerning returns future periods are different at the end of (t_1) than they were at the beginning of t_1 ;
 - iii) during (t_1) the rate of interest changed;
 - iv) if expectations about future rates of interest in $(t_2, t_3, t_4 \dots t_n)$ are different at the end of the first period from what they were at the beginning.

From market data the income that can be measured, or observed, is the actual change in the value of assets over a period. Where appropriate, adjustments can be made for

dividend payments. Income defined as Consumption plus Actual Capital Accumulation can be measured. This concept absorbs all the possible changes mentioned in (i) - (iv) above and so includes revisions of capitalisations due to changes in expectations (or in uncertainty) relating to the future. Most economists and accountants would then argue that the element of capital appreciation which is attributable to changes in expectations should be separated from the element of capital appreciation which represents an accrual. That is, the capital appreciation which would have taken place if both actual events and predicted states of mind had been correctly anticipated at the beginning of the period.

It is only the latter which is a continuous flow in time (ie so much per month, per year); the former is the result of a revaluation occurring at an instant in time.¹⁰

This concept excludes windfalls attributable to changes in expectations but cannot be observed from market data because:-

- i) it is necessary to know what asset values would have been at the beginning of the period (t_1) if events had been correctly foreseen; and
- ii) if the states of mind relating to $t_2, t_3 \dots t_n$, had been the same at the beginning of the period as at the end.

Income, on this definition, is the difference between a hypothetical capital value at the beginning of the period and the actual value at the end of the period. It might be thought that ex-post income could be calculated by

multiplying the capital value at the end of the period by the rate of interest that has prevailed during that period, ie looking backwards. This approach is not helpful as interest ex-post can no more be inferred from market price than ex-ante interest. In both cases the concept is dependent on hypothetical valuations: the expected value of assets at the end of the period in the case of the latter, and in the former the 'revised value' of the assets at the beginning of the period.

2.4 Mathematical summary

The various relationships discussed above can be clarified by examining the various algebraic formulations implied by the above discussion. These are set out below. ¹²

Notation

Let K_1 = the actual value of assets at the beginning of the period, and

K_2 = the actual value of assets at the end of the period. This value might need adjusting for interest or dividend payments made during the year.

K'_2 = the expected value of assets at the end of the period, as viewed at the beginning of the period, and

K'_1 = the revised value of the assets at the beginning of the period, that is, the value assets would have possessed had the expectations at the end of the period been the same as at the

beginning and if the events occurring during the same period had been correctly foreseen at the beginning

i_a = ex-ante rate of interest

i_p = ex-post rate of interest

Y_p = income - ex-post

Y_a = income - ex-ante

then

$$Y_a = K'_2 - K_1 \quad 1.$$

$$Y_p = K_2 - K'_1 \quad 2.$$

$$i_a = \frac{K'_2 - K_1}{K_1} \quad 3.$$

$$i_p = \frac{K_2 - K'_1}{K'_1} \quad 4.$$

Under perfect foresight $K_2 = K'_2$ and $K_1 = K'_1$

and so $i_a = i_p$

and
$$Y_a = \frac{Y_p \times i_p}{1 + i_p}$$

and can both be written $K_2 - K_1$

which represents the actual appreciation in capital as measured by market values.

In all other cases, neither ex-ante nor ex-post income can be objectively computed from market prices because both concepts depend on a hypothetical value, K'_2 or K'_1 which has no definite meaning where peoples' expectations are not homogeneous. There is an exception to this general rule in the case of risk free short-term loans made for a standard income period, eg one year treasury bonds, where a year is

assumed to be the standard period. The possibility of a windfall loss in the second period rules out the calculation of income for a two year bond. This statement can be generalised to the case of a bond with n years before redemption. Hence the exception referred to above.

2.5 Hicks ¹³

Hicks' definition is by far the most celebrated and misused concept of income. He defined a person's income as 'the maximum amount which he can consume during a week, and still expect to be as well off at the end of the week as he was at the beginning.' ¹⁴ It should be pointed out that Hicks was suggesting a concept of income that would serve as a prudent guide to the amount a person could consume without impoverishing himself. He was not suggesting, contrary to some ideas expressed in the literature, a definition which could be the cornerstone of any accounting measure of income. If the rate of interest was expected to remain constant, the income of a period would equal the interest on the capitalised value of the prospective receipts and in effect the latter represents a perpetuity.

Let V = Capitalised value of prospective receipts
 r_k = Interest rate - where r is expressed as a percentage and k the subscript represents a constant

Y = Income

$Y = Vr_k$ 5.

Where the rate of interest is not expected to remain constant equation 5. no longer holds. That is, income no

longer represents the interest on the capitalised value of prospective receipts, or the amount remaining after maintaining the capitalised value of the prospect constant. Income cannot be described at all, except in terms of the prudent guide and as a result Hicks concludes that 'we shall be well advised to eschew income and saving in economic dynamics. They are bad tools which break in our hands.' ¹⁵

Hicks' definition differs from Fishers' in two respects:-

1. It includes savings and so includes the amount that could be consumed whether or not consumption actually takes place.
2. It excludes over-spending by maintaining the original capital.

A more fundamental point about Hicks' definition is that, in contrast to the work of Fisher and Lindahl, it eschews any connection between the notion of income and capital. Using the Hicksian approach the source from which the income is derived disappears and capital only appears as the capitalised value of a certain future prospect. Income therefore becomes the 'standard stream equivalent of that prospect'. As Kaldor ¹⁶ points out capital and income become two different ways of expressing the same thing, not two different things.

The condition under which this 'standard stream equivalent' notion has no meaning is where the income derived from a given capital is expected to change over time. ¹⁷ Even in Hicks' terminology this involves a contradiction in terms. Income cannot be expected to change; all changes are implicitly absorbed in the calculation of the standard stream equivalent. This calculation cannot be effected where the change in income

over time has causes other than the accumulation or consumption of capital. For the economy as a whole, where productivity is increasing and there are expectations of rising income it is not possible to express this improvement in terms of a constant perpetual stream since interest rates are reflections of these yields.

Another problem with Hicks' concept is that it is not clear how he would treat a change in actual receipts relative to expected receipts. That is, an unexpected change in receipts rather than a change in future receipt expectations. Kaldor ¹⁸ cites the example of a man who receives an unexpected sum in a particular week, which did not affect his expectations for the future. The amount which he can spend during the week 'without impoverishing himself' depends on whether we regard his state of wealth before or after the accrual of those receipts. The man could clearly spend the total amount and still be 'as well off at the end of the week as he was at the beginning.' If he does spend this amount he cannot expect to be able to spend the same amount in each succeeding week as in that particular week. The reasons for these difficulties are that income and capital are interrelated and that neither can be given a meaning without considering the other.

The concept of 'maintaining capital intact' is also fraught with difficulties. For instance, from the individual's point of view expected diminutions in the market value of resources have the same significance whether they are attributable to physical depreciation, foreseen changes in demand or some other specified change. This does not mean

that any expected change in earnings could be allowed for in the depreciation provision, irrespective of whether it is reflected in physical productivity, or the market value of the individual's assets. Since the concept of capital and 'maintaining capital intact' is subject to these limitations it also implies that the income concept will be deficient, given the interrelationship between the concepts of income and capital. To overcome these difficulties Hayek¹⁹ suggested that the maintenance of capital should be refined in terms of the maintenance of income. The pitfall of this approach is that it involves circular reasoning. It is not legitimate to define income as what is left after maintaining capital intact and then to define the latter as what is required to maintain income intact.

Another problem raised by the Hayek-Hicks approach concerns the treatment expectations. If, for instance, people expect a general fall in interest rates, is the resulting expected appreciation in capital value part of income? In a text book world an expected fall in interest rates would mean a fall in the expected yield of resources. A fall in interest rates would, as in the case where there is a fall in the general yeild on capital, lead to a fall in capital values. In the real world asset values and interest rates can change independently and so a change in interest rates does not necessarily reflect any real change in the income derived from the economy's capital resources. Where people expect a general change in interest rates the ex-ante/ex-post method of calculating income does not succeed in excluding elements which represent revaluations and not accruals. The

expectations approach only measures real increases in 'resources' when the general price level is expected to remain constant and when expectations concerning changes in the level of interest rates reflect nothing else but changes in the yield of resources generally.

2.6 Alexander²⁰

Before considering his concept and comparing it to that put forward by Hicks it is necessary to modify our notation to facilitate this comparison.

1. K_1 - the capitalised value at t_1 as anticipated at t_1
2. K'_2 - the capitalised value at t_2 as anticipated at t_1
3. R_1 - the receipts at t_2 as anticipated at t_1
4. K'_1 - the capitalised value at t_1 seen at t_2
5. K_2 - the capitalised value at t_2 as anticipated at t_2
6. R_2 - the receipts at t_2 as received at t_2

1. 2. and 3 contain information on which an ex-ante measurement of income is based whilst 4. 5. and 6. contain the additional information needed for an ex-post measurement.

$$\text{Income ex-ante} = R_1 + K'_2 - K_1 \quad 6.$$

In the absence of a price level change this represents the amount that can be spent whilst still retaining the same prospect as before.

Where $K_1 = K'_1$, R_1 is equal to ex-ante and ex-post income

Where $K_1 \neq K'_1$ an allowance has to be made for the expected changes in the capital value of the income stream

$$\text{Income ex-post} = R_2 + K_2 - K'_1 \quad 7.$$

Where $K_2 = K_1'$, R_2 becomes equivalent to income
 $K_2 \neq K_1'$ ex-post and adjustment must be
made to the actual receipts in
respect of the interest on the
difference

Hicks argues that the change in expectations $K_2 - K_1'$ has to be thought of as raising income for future time periods by the amount of interest on them, rather than as entering into the calculation of income.

Alexander suggests not a standard income stream but a variable one. His measure of income is:-

$$R_2 + K_2' - K_1 \quad 8.$$

that is, the actual receipts of the period plus the expected changes in prospect. He argues that future receipts are uncertain and so to impute hind-sight values, as in equation 7. to the beginning of the year equity is unreasonable. It follows that he does not have any regard for the argument that the change $K_1' - K_1$ is a saving that relates to an earlier period. The concept of variable income is justified on the basis that each year's net receipts are a quantity subject to chance fluctuation. The difference between the two concepts is that Alexander maintains capital at K_1 , whereas Hicks' (ex-post concept) maintains capital at K_1' .

Having considered the ideas on income put forward by these two writers the question remains as to which of these ideas is the most suitable for measuring ex-post income.²¹ In appraising the writings of these two writers it is necessary to set up a criteria by which to judge their contributions. In this context any satisfactory concept of measuring ex-post income must be theoretically sound and be capable of general

application. This does not mean that these two yardsticks are separate and it is likely that where a concept is capable of general application only theoretical inconsistencies will also arise. Alexander specifically adapted his concept of variable income for the purposes of general application. On this basis it seems convenient to deal with his ideas first. R_1' , the actual receipts for the period will be the change in net tangible assets over the period before taking into account any distribution. These receipts will be augmented by $K_2' - K_1$, the expected changes in the firm's valuation between the two points shown in the subscript. Alexander would also include certain unexpected changes where they are attributable to managerial activity, such as unexpected goodwill, which is generated internally. He would, however, exclude unexpected changes that were due to external forces, such as changes in the interest rate to be applied in discounting future receipts. The inclusion of unexpected gains or losses, attributable to managerial activity, is justified on the grounds that they are similar to increases in the value of shares attributable to dividend restriction. This begs the question - should expected changes in the value of goodwill arising from external factors be excluded, or should they be included merely because they are expected? It seems that Alexander would include expected changes due to factors other than managerial activity on the grounds that they are expected, whilst he would also include unexpected changes that are a result of managerial activity. In the context of measuring ex-post income the question remains as to whether expectations and managerial effort can affect the level of

consumption, whilst maintaining the level of capital.

Alexander ²² in this context argues that

'Because different interpretations are possible, and because any concept of income can be justified only by reference to the use to which it is put, the only criteria by which a choice may be made among various methods of measuring income is the relative effectiveness of the different methods in serving the purposes for which the concept of income is to be used.'

Applying this criteria Alexander's concept of variable income suffers from three defects. These are set out below.

1. The concept lacks consistency. For example, the treatment of expected changes in the value of goodwill not attributable to managerial effort and the treatment of unexpected changes in goodwill that are a result of managerial activity. It would seem difficult in the case of unexpected changes in goodwill to ascertain the causes of the change. A further difficulty would presumably arise in the case where unexpected changes in goodwill were the result of both internal and external factors. Separating the components would be an extremely difficult, if not impossible task. Alexander's concept in this respect is internally inconsistent and it is difficult to fault Hicks' point that account should be taken of changes in the closing prospect as the latter represent changes in the future income stream. These changes should be recognised and the cause should be identified where possible but this should not influence whether such changes are incorporated in a general measure of income.

2. A more fundamental flaw is his capital maintenance base, K_1 , rather than K'_1 . It seems contradictory to include in an ex-post measurement of income actual receipts and then to maintain capital at a figure which is known to be wrong and to measure capital accumulation by reference to another figure which is also known to be wrong. As a consequence Alexander's variable income figure will be of limited value to the investor as a guide to the firm's expected future profitability. In this context it would seem more justifiable to base the measurement of ex-post income on later rather than earlier figures.

Having examined Alexander's ex-post concept we now turn to the question of whether Hicks' ex-post concept is superior. In addition to the limitations discussed earlier, Hicks' concept has two further defects. These are discussed in some detail below.

1. In a world characterised by uncertainty the usefulness of a concept which produces a standard stream of income is questionable. In effect Hicks' concept is an adjusted version of income as interest. Whilst an investor is interested in total income over a period, he is more interested in periodic income in order that he can make his own judgement as to future income. In addition, as many writers have pointed out, the accuracy of forecasting future receipts is likely to vary inversely with time. If what he is told is the result of applying an interest rate to uncertain future receipts it seems highly questionable as to what use this

information will be to him. It tells him nothing about the probability of achieving those receipts or for that matter when they might arise.

2. Hicks' concept of income can involve a certain circularity. This arises as a result of adjusting the opening capital difference $K'_1 - K_1$. As was noted earlier, this creates an ever changing gain or loss at the date when the company was incorporated. In effect this creates a figure for goodwill which would originally have been inserted had what is known now been known then. If this had been the case higher receipts would have been expected and a higher income stream realised. This capital gain is really income and McDonald²³ suggests that the circularity stems from measuring income in terms of value which itself is another measurement.

It is clear from the above discussion that the various economic concepts of income and capital are unsuitable as a basis for reporting an organisation's periodic income. This should not surprise us as the various writers' views that have been considered in this chapter were addressing other problems. For instance, Fisher's notion of income and capital was formulated as part of his theory of interest rates, Lindahl's concept was developed as part of a theory of capital and employment, whilst Hicks' concept was an appendix to a path-breaking book on value and capital theory. These authors did not address themselves to the problem of an appropriate measure of income for accounting purposes and should not be judged on that basis. Had economists been asked this question it is interesting to speculate whether,

like Keynes ²⁴, they would have

'decided to take refuge in the practices of the Income Tax Commissioners and, broadly speaking, to regard as income whatever they, with their experience, choose to treat as such. For the fabric of their decisions can be regarded as the result of the most careful and extensive investigation which is available, to interpret what, in practice, it is usual to treat as net income.'

3. PRESENT VALUE ACCOUNTING

Whilst the above discussion has highlighted the weaknesses of the economists' concepts of income and capital there are a number of writers ²⁵ who regard the reporting of expected present values as an ideal concept for accounting but usually qualify this by saying that because of the difficulties involved in calculating present values, surrogates have to be used. To date, only one writer ²⁶ has published anything about the form it could take in published accounts. His calculation of income is based on the product of the discount rate and the opening EPV. In his article he does not deal with changes in expectations, the discount rate, or differences between expected and realised cash flows. The reasons why this system (or perhaps it would be more appropriate to refer to it as a suggestion) has been both neglected and rejected are set out below.

1. The calculations are based on expectations of the future, rather than statements of fact about achievements to date. An estimate of the future can provide a norm or target, but it can give no idea of the progress or position at any particular point in time.

2. The calculations are based on expectations at a particular point in time and so cannot take into account subsequent changes in expectations, these may change as a result of relative price change, tastes and other demand factors.
3. A change in expectations will change the capital value of the business. This will be reported to the shareholders at the year end; what won't be reported is the cause of the changed expectations. In short the balance sheet of the company over time will report management's state of mind, rather than account for the affairs of the business.
4. Investors and inter-firm comparisons. Suppose accounting statements were based on present values as estimated by management, there is no way in which investors can have any assurance that the value can be compared, or that they are feasible. It is well known that management vary in their degree of optimism. Even the same person may have different degrees of optimism about different projects, or about the same project in different circumstances. The presence of auditors will be of no assistance to the investor, because they can only check the arithmetic accuracy of the managements' figures and not the authenticity of the underlying forecast.
5. What is known as the aggregation problem. It is a relatively simple matter to calculate the present value of an asset if in isolation it yields an income. Problems arise when an asset yields an income only in combination

with other assets. This can be illustrated by reference to an example. Suppose cash, plant and materials are used in the project. How do these individual assets affect the expected income over the life of the project? As all three are necessary it follows that the absence of any one would diminish the project's present value to zero. This would mean that the present value of each of these assets would be equal to the present value of the whole project; the total present value of the three assets would be three times the present value of the whole project. Clearly these valuations are unrealistic.

6. If users need to know individual asset values some other basis of accounting is required. Separate asset values are needed to appraise amongst other things, asset replacement, liquidity, solvency and gearing. Managers for example need to know the market value of individual assets, in order to calculate the present value of new projects where it would necessitate liquidating some of the existing assets. Investors also need the same information in order to appraise the benefits of liquidation and to evaluate alternative investment opportunities.

7. Bromwich²⁷ has used the economic concept of consumer surplus to show that investors will generally value differently any given security and so a single estimate by management of the present value of the assets under their control cannot serve all investors under all circumstances. The surplus arises because investors will differ as to their consumption preferences and views

concerning risk. As a result each investor will have a different rate of time preference and so the reporting of a single present value is inappropriate. Similar arguments to these have also been advanced by Peasnell.²⁸

Summary

Sufficient has been said to show that this kind of accounting is a calculation and does not report actual states of affairs or results. The figures represent valuations of a specific future configuration of events and as such disregard the possibility of short term adaptation. In addition the figures in the balance sheet are subjective and unreliable at the time the values are calculated. When making forward calculations of discounted values it is appropriate to assume regularities. However, it is not necessary for users to know how good past calculations have been, it is more important to report past trading performance. This report should take into account all the irregularities, deviations from plan and unforeseen events that have put the firm into the position it is in at the date of the financial report.

4. CONCLUSIONS

Section Two of this chapter showed that the economists' concepts of income and capital were of little use to the accountant in trying to measure an organisation's income and capital. However, the concept of present value, which featured prominently in the economists' discussions in this context, was a more robust concept. Whilst this basis is regarded by a number of accountants as the 'ideal' basis, the arguments

against reporting present values were numerous. It must be concluded, as did the Sandilands Committee ²⁹, that PVA is not appropriate for the needs of users of accounts.

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4

C O N T I N U O U S L Y C O N T E M P O R A R Y

A C C O U N T I N G

(C O C O A)

1. Introduction
2. The main features of Continuously
Contemporary Accounting (COCOA)
3. Chambers and his critics
4. Empirical studies of Continuously
Contemporary Accounting
5. Conclusions
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References

1. INTRODUCTION

Continuously Contemporary Accounting (COCOA) is closely associated with the writings of its most ardent and longest standing supporter, Chambers.¹ This system of accounting has found little support in the UK but in the US it has been advocated by Sterling² and a large international accounting firm, Arthur Andersen and Company.³ The most systematic and comprehensive explanation of COCOA can be found in Chambers' widely acclaimed book 'Accounting, Evaluation and Economic Behaviour'.⁴ In Section Two of this chapter the main features of his system will be described, together with an explanation of why Chambers and Sterling support this system. Section Three will review the criticisms that have been made of the system: Section Four will report the results of several empirical studies which have tested certain aspects of COCOA. Section Five will conclude by briefly reviewing the main discussion points of this chapter.

2. THE MAIN FEATURES OF COCOA

2.1 The main features

In essence, all the assets and liabilities in the balance sheet would be valued at their current realisable prices ie the price at which assets could be converted into cash and liabilities discharged. For this reason the more embracing term 'current cash equivalent' is often used as it more readily includes monetary assets and liabilities which do not have selling prices as such. The relevant selling prices are those which relate to the disposal of assets in

the normal course of business, rather than on a forced liquidation.

The firm's initial non-monetary assets are valued at selling prices prevailing at the beginning of the period, whilst the closing ones are valued at year end prices. It is not necessary to distinguish between physical assets and marketable securities as both are valued on the same basis throughout. In the case of inputs, such as stock, the initial entries will be the prices paid. Any changes in the prices of inputs the firm purchases are incorporated in the books immediately. The relevant entries are as follows. Suppose the stock of a particular material consists of 100 units at £1.0 each and that another 50 units are acquired at £1.10 each. The value of the 100 units in stock will be £1.10 per unit. The balance on the materials account will be 150 units at £1.10 per unit. The difference (100 units at 10p) is credited to a price variation account. At the end of the year the stock will be valued at its resale selling price. If this value exceeds the book value (which is based on current purchase prices) the excess will again be credited to the price variation account. Where the book value exceeds the amount shown on the resale price schedule, the latter will still be carried forward in the balance sheet and the necessary adjustments will be effected by debiting the price variation account with the difference. As stated above, monetary assets and liabilities are valued at their current cash equivalent or realisable values.

Current income represents the increase in the current cash equivalent of net assets over the period and is made up .

of two components - operating profits and holding gains. The latter are included because they represent an increment in current spending power over goods and services in general. Capital is considered to be a fund of financial resources and is valued at its current cash equivalent. Income is calculated by deducting from the closing cash equivalent, the opening cash equivalent after maintaining the purchasing power of the shareholders' equity. As such COCOA captures both types of price change. Changes in relative prices are incorporated in asset values whilst changes in general prices are incorporated in shareholders' funds.

A fundamental characteristic of COCOA, which is not present in all the other systems, is the complete rejection of the realisation concept for measuring periodic profits. As non-monetary assets are revalued when their price changes this means that holding gains or losses are recognised as they accrue, rather than when sold. The critical point in the operating cycle is acquisition and not disposal. This can be contrasted with RCA which only recognises operating profits when the assets purchased for resale are sold.

Because holding gains or losses are recognised as they occur it is difficult to separate holding gains from operating profit. This distinction has little meaning for operating assets. For example, is the profit margin on inventories held for resale, a holding gain or part of operating profit? As retailers only trade in goods with a reasonable prospect of a profit margin the holding gains must be considered as part of operating income. However, whilst in many cases this dichotomy is blurred, the distinction is not important as

holding gains are part of profit. The distinction is more crucial in RCA where holding gains are regarded as part of the firm's capital.

2.2 Sterling⁵

He supports the use of current selling price because this 'one bit of information is relevant' to the largest number of decisions. 'Other bits ... are relevant to one or more, but not all decisions ...'⁶ Elsewhere, he states that Command over Goods (COG), that is, the proceeds that can be obtained by selling assets to obtain goods 'is the relevant attribute.'⁷

2.3 Chambers

Because of space constraints this section must be short. As a result it will not be possible to do justice to Chambers' work. Most of his ideas are contained in what has become a classic accounting text 'Accounting, Evaluation and Economic Behaviour'.⁸ His starting point is based on an empirical observation he made as an accountant to the effect that⁹ -

'The idea of a firm which went on doing the same things year by year, or which set up plans and stuck to them - an idea which many describe as the going concern concept - did not match the observable behaviour of the business community. Changes in the environment and in the expectations of businessmen constantly obliged business firms to respond, sometimes aggressively, sometimes defensively. It became clear that the form which adaptation took depended in part, often a crucial part,

on the means at the disposal of a firm. Knowledge of the present facts, in particular the present financial facts, of a business was a necessary condition of informed adaptation. And as adaptation is continuous, knowledge of the financial facts must be continuously brought up-to-date.'

Chambers then gave this casual empirical observation an impressive underlying theory. This theory encompasses human behaviour, management and the role of accounting information. The latter, he argues, should satisfy four criteria: the overriding one of these four is relevance - 'the property by which information is serviceable in the adaptive process at a point in time'. Relevance is seen as having two components:-

i) to contemporary and future action in markets.

For this purpose the information must be widely interpretable and result from methods which have substantial uniformity and are up-to-date; and

ii) the information must be objective in the sense of producing comparable results when subjected to independent review.

This second component rules out anticipatory calculations, such as budgets, as these cannot be objective.

For Chambers, the only relevant information which can be useful to the process of adaptive behaviour is that which focuses on the opportunity cost of holding assets. This is measured, he argued, by their 'cash equivalents' or market resale prices. In the next section the criticisms that have been made of Chambers' work will be reviewed.

3. CHAMBERS AND HIS CRITICS¹⁰

3.1 The use of current resale prices in respect of fixed assets implies that it is intended to sell them.

Chambers:

A shareholder can look at the buyer's quotation for his shares day after day without any intention of selling them on a particular day. He simply wants to know how his investment stands. If he concludes at some time that he will be better off by taking the price offered and doing something else he will sell his shares. But watching one's position, like watching the financial position of a firm, is preparing oneself for what one might do when better opportunities arise.

3.2 The quoted resale price is not a guarantee that this sum could be realised if the asset was sold.

Chambers:

It is not the intention of the system to predict with a high degree of accuracy what would be obtained if any goods were sold. The intended function of the balance sheet is to indicate the current financial relationship of the firm with the rest of the world. Quoted prices, or approximations to them, indicate the extent of the firm's claims against all other goods and services. Resale prices are not the opinions of the firm or its officers alone, as many figures in traditional balance sheets are admitted to be: they are prices or approximations which others in the community are prepared to pay, or are currently paying. This quality of the system is

particularly important as far as outsiders are concerned. If the management of a firm, or its accountant, reports the internal values placed on the assets in its financial statements there can be no assurance that the statements fairly indicate the firm's financial position. Insiders may be pessimistic or optimistic.

3.3 Baxter ¹¹

He has raised the following points:-

1. the chances that a healthy firm will swap the assets it needs for everyday production are small.

2. Additional ventures are usually financed by liquid assets or borrowings, or some combination of the two.

Potential lenders and investors tend to be more impressed by the prospect of high and sustained earnings than by scrap values. The latter can be comforting background information

3. The range of the term 'sale price'. It could cover a variety of situations, from a leisurely sale in the ordinary course of business, to a sale in distress circumstances when the sale could take place at almost any price. If the assets will only be sold in improbable circumstances the realistic valuer should take these into account.

However, the question then is, what would be the least improbable circumstances that would lead to the fixed assets being scrapped? Obviously near-bankruptcy is one situation, but if this is assumed the underlying causes have to be taken into account, such as a general crisis which implies a slump in world prices. Once this is admitted there is no end to the possible catastrophies the

valuer must take into account. Baxter cites the case of a piano: it could be argued that the most plausible sale price is the price it will fetch as firewood during the next ice-age; this information is of little use to a current balance sheet.

4. The practical difficulty of determining realisable value for many assets. Some may have no known marketable value (eg goodwill and some plant and machinery) or which in their present form are not readily resaleable (eg semi-processed inventory). This criticism should not be overstated as a case study by McKeown ¹² has shown.

5. In the case of highly specific assets often referred to as non-vendible durables, the sale price will be substantially below the purchase price. As a result, the sale price is a bad indicator of 'size' and leads to an excessive earnings/asset ratio. The absurdities can be seen in the context of income measurement. If the firm must write-off the difference between a new asset's cost and its sale price, the accounts may show a loss if a company buys useful but specific assets, and a profit if it buys unsuitable machines with a high resale value. In the same context Solomons ¹³ has said:

'Such assets would generally be highly specific to a particular business but might, of course, be excellent investments nevertheless. Since these assets have no alternative use outside the business, holding them involves no opportunity cost, and in Chamber's view, recognition of their zero resale value must force the business to recognise a loss of residual equity as soon as such an asset has been

bought. Yet clearly the asset would not have been bought if the business had thought of the purchase as involving a loss. The use of resale prices in this situation leads to what I can only regard as an absurdity and a flagrant failure to measure up to the criterion of correspondence with the economic events which are being recorded.'

In a later paragraph he argues:

'The absurdity of having to record a presumably sound investment as if it were a loss of capital, simply because the assets invested in have no resale value, results from the refusal, which runs through Chambers' discussion, to recognise, for accounting purposes, that values depend on expectations. The defence of historical cost as the valuation base for fixed assets has traditionally rested on the argument that such assets are held for use, not sale, and that therefore their resale prices are irrelevant. If the argument had stopped there, it would have been sound enough. Where it went wrong was in the conclusion that historical cost was relevant. The right conclusion, in my view, is that it is 'value to the owner' that is relevant. If this falls below resale price, a rational owner will sell. An asset which is not held for sale must, therefore, be worth more to its owner than its resale price. The failure to recognise that the owner of an asset which is not for sale does not directly suffer if its resale price drops, unless this price change is associated with some change in his expectations (as indeed it may be, indirectly, or in the long-run) must be regarded as a serious flaw in Chambers' theory.'

Chambers ¹⁴ has replied to this criticism in the following terms:-

'The way in which the firm's affairs are reported puts investors on notice of several things. First, it indicates that the firm has a high rate of return on the sum of money it can invest in any alternative; an infinite rate of return even if the net income is only \$1, for the sum it could invest (apart from retained income) is zero. Second, it indicates that the firm has no means of securing a continuing income, if the asset becomes exhausted or obsolete, other than by retaining and reinvesting some of the cash generated each year. If the asset were shown at cost less amortization, investors would be entitled to suppose that the asset (by association in the balance sheet with other money-like assets) is salable and that continuity of the firm's income may be secured otherwise than by retaining profits. Third, it indicates that the firm has no property-base for borrowing, though it might be able to borrow on the strength of its expected earnings. If the asset were shown at cost less amortization, there would seem to be a property-base for borrowing when in fact there is not. Fourth, it indicates that the firm's original cash is now locked in. Investors will be prepared to pay less for a share in the firm than in other firms having salable assets and the same income expectations, because of this lack of asset-coverage. Whatever they pay they will know they are paying for their share in the firm's income prospects only.

3.4 COCOA as compared to other accounting systems

Chambers has claimed other virtues for his system.

These are set out below.

1. HCA is often justified on the grounds of objectivity; the underlying reasoning for this assertion usually takes the following form. The accounts contain the original entries of the transactions as they occurred. The final financial summaries do not contain the unmodified results of manipulating those entries; the events of the year will have necessitated many of these entries. As the accounting system contains them they can be checked in their original form in the course of any audit of the accounts. Auditors are able to give assurance that no unauthorised or improper usage of the firm's funds has occurred.

Chambers argues that his system meets these requirements and so satisfied one of his four criteria for accounting information - objectivity.

2. Price level adjusted accounting is justified on the grounds that it avoids the addition of unlike quantities and that it takes account of changes in the purchasing power of money. The proposed system also satisfies these specifications. In the course of deriving the final figures there are additions and subtractions of different pounds. But the overall corrections, the price variation adjustments and the use of current prices at the close of the year, have the effect of incorporating into the final statements homogeneous pounds.

3. The use of current prices is one of the advantages claimed for replacement price accounting. The system proposed also uses current prices by making the price variation adjustments and in deriving the financial position at the year end by reference to current prices. Though the proposed system uses different current prices (selling prices) from those of the replacement price proposals, it does use current prices.

4. Present (discounted) value accounting is said to be necessary for forward-looking estimation. But it pre-supposes that reported present values are reliable. The system here proposed requires no such assumption: no future estimates are free of the biases and guesswork of those who make them. The system goes as far as it is possible to go by giving the best indication of the actual state of the firm at each reporting date. It therefore meets the criteria that the information should be useful for forward-looking estimation, without committing readers of financial statements to the optimistic or pessimistic forecasts of managers and accountants.

5. Other practical consequences. The financial statements can be analysed without committing the solecism of relating figures in unlike pounds. The figures in the balance sheet and the net income figure are all in pounds of the closing date. If all firms used the same system, as they would if it were generally adopted, interfirm comparisons would be realistic and mathematically valid. This is not true at the moment. In particular, inter-period comparisons of ratios would be valid; as successive

financial statements are pure numbers, or percentages and are thus comparable with like numbers, or percentages of other years. In addition, the figures would be interpretable as they are all in reasonably up-to-date purchasing power units.

4. EMPIRICAL STUDIES OF COCOA

Whilst Chambers¹⁵ has written prolifically about his system very little has been published about the problems or otherwise of implementing COCOA and the effect it would have on such things as reported profit and asset values. Four of the five studies have tried to show, in one way or another, that COCOA is more objective than cost-based generally accepted accounting principles. The fifth is more interesting in that it examines the effect of COCOA on reported profits and the return on equity.

The first empirical study of COCOA was by McDonald¹⁶ who examined the dispersion of depreciation charges based on net realisable values with those based on HC. Automobiles were selected for investigation because they are classified as a fixed asset in the balance sheet and data is readily available on market values. A questionnaire was sent to respondents who were asked to select a depreciation pattern for a car fleet. The resulting depreciation provisions were then compared to the depreciation charges based on net realisable values. He found that the degree of dispersion in the HC charges was greater than those based on net realisable values.

In a later study by Sterling and Radosevich ¹⁷ the variance of market based values was found to be greater than those based on cost. It could be that this finding is attributable to the instructions given to the respondents, who were asked to 'take a guess at the fair market value as of today'. It is very questionable whether respondents would have used this procedure in preparing their financial reports. However, the authors ¹⁸ felt able to conclude that:

'In general, we would expect current values to be more objective for types of assets which have well established market price indicators, such as automobiles. For a class of other assets with markets that are not so well defined, the current values would be less objective.'

McKeown ¹⁹, using a case study approach, found similar results to McDonald's. He applied exit-values to a medium-sized road construction company and found that 75% of the fixed asset items had a lower depreciation dispersion using net realisable values, than if they had used generally accepted accounting principles.

In a more recent study, Parker ²⁰ has compared the comparability and objectivity of exit-value with current financial accounting practice. His measures of these two attributes were based on the work of Ijiri and Jaedicke ²¹ and the asset used in this study ²² was a printing calculator. Exit-values for the asset were ascertained from dealers in office equipment. Book values were obtained by a questionnaire to 400 holders of maintenance contracts on the printing calculator. From the results he felt able

to conclude that:-

1. Exit-values exhibited greater comparability than did book values.
2. Exit-values were more objective than book values.
3. The major cause for the lack of objectivity in book values was dispersion in accounting estimates - not accounting methods.

Gray ²³ has applied Chambers' system to the accounts of Richard Costain Limited, a multinational company based in the UK, for each year over a four year period from 1969-1973. His results are set out in TABLES 1 and 2.

It is evident from these tables that:-

1. The range of adjusted profits (£9.5million to £3.1 million) is greater than the published range (£4.9 m - £1.9 m)
2. This was also true of return on equity: the adjusted rates were 43.2% - 6.41% whilst the published range was 31.42% to 19.87%

He also noted that:-²⁴

'An examination of the results for individual years reveals that 'conventional' profit calculations both overestimate and underestimate the actual situation given that 'continuously contemporary' accounting is an accurate reflection of the impact of price changes on business fortunes. In 1969-70, 1970-71 and 1971-1972 the published profit figures are an underestimate in contrast to the adjusted results (but note, in contradiction, that in 1971-72 the published rate of return figure is an overestimate). However, in 1972-73

TABLE 1

COMPANY PROFITS: A STATEMENT AND RECONCILIATION (£000'S)

	a	b	c	d	e		
	PUBLISHED PROFIT	ASSET PRICE GAINS/LOSSES NOT RECORDED	EQUITY CHANGE AT MARKET VALUE (a+b)	INFLATION ADJUSTMENT	ADJUSTED PROFIT (c + d)	PUBLISHED DIVIDENDS	PUBLISHED RETENTIONS
1969-70	+1902	+3755	+5657	-1116	+4541	396	1506
1970-71	+3044	+7890	+10934	-1760	+9174	816	2228
1971-72	+4940	+7066	+12006	-2477	+9529	1021	3919
1972-73	+4828	+2869	+7697	-4608	+3089	885	3943

SOURCE: GRAY S J Accounting for price changes: a case study of a Multinational company

TABLE 2

P E R F O R M A N C E C O M P A R I S O N S

R A T E O F R E T U R N O N O P E N I N G E Q U I T Y

	PUBLISHED	ADJUSTED
1969-70	19.87%	29.75%
1970-71	27.20%	43.20%
1971-72	31.42%	27.35%
1972-73	23.58%	6.41%

SOURCE: GRAY S J Accounting for price changes: a case study of a multinational company

the position is reversed; the published result is an overestimate.

5. CONCLUSIONS

From the above review it is difficult to avoid the conclusion that whilst Chambers has made a major contribution to accounting theory, his system, COCOA, is not appropriate to the needs of investors and managers. Whatever Chambers might say his system undoubtedly assumes that the business is going into liquidation. As most businesses are going concerns this is a serious defect. The most telling of the deficiencies have been exposed by Baxter and in the case of non-vendible durables, Solomons. Although he has replied to Solomons' criticisms the replies are far from convincing. Whilst COCOA has serious theoretical deficiencies it is difficult to make any conclusive pronouncement until more empirical evidence about the system is available. From a practical viewpoint, until the deficiencies referred to above are resolved and more empirical evidence is available COCOA is not likely to gain acceptance amongst both practising and academic accountants.

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5

C A S H F L O W A C C O U N T I N G

(C F A)

1. Introduction
 2. The Lawson System
 3. The Lee System
 4. Advantages of Cash Flow Accounting
 5. Disadvantages of Cash Flow Accounting
 6. Conclusions
- References

1. INTRODUCTION

Cash flow accounting is supported by those who feel that the problems of asset valuation and income measurement are so formidable that an alternative accounting system must be devised, which avoids these problems and yet provides a reliable guide as to how a company has performed in the past and how it is likely to perform in the future. It is claimed by those who support cash flow accounting, that this system of accounting satisfies these requirements and that companies should include in their annual report a comprehensive cash flow statement. As implied by its name, under a comprehensive cash flow accounting system entries would only be made in the books of account when cash was actually received or paid out. This means that fixed assets and materials purchased for either resale, or further processing, would be charged in full to the year in which they were acquired, irrespective of when the benefits from acquiring these assets will accrue. From a purely book-keeping point of view, historic cost accounting is very similar to cash flow accounting, except that the latter would not incorporate any valuations and would ignore funds items such as debtors and creditors.

The development of cash flow accounting, in both professional and academic circles, is closely associated with the work of Professors Lawson ¹ and Lee ².

2. THE LAWSON SYSTEM

It has been argued by Lawson that his system of cash flow accounting provides an analytical framework for linking

TABLE 1

FRAMEWORK FOR A TOTAL CASH-FLOW FINANCIAL SYSTEM

	End Year	1	2	3	etc.	etc.
(1) Increase or decrease in bank balance or overdraft		+	+	+	+	+
(2) Net operating cash-flows		+	+	+	+	+
(3) Corporation taxes on (2)		-	-	-	-	-
(4) Capital expenditure (including portfolio investment)		-	-	-	-	-
(5) (i) cash grants; and		+	+	+	+	+
(ii) tax rebates resulting from tax depreciation allowances on (4)		+	+	+	+	+
(6) Long term debt flows (in and out) including interest payments on debt		+	+	+	+	+
(7) Tax rebates on debt interest payments		+	+	+	+	+
(8) External equity finance		+	+	+	+	+
(9) Sales of surplus assets		+	+	+	+	+
(10) Tax rebates on existing assets and losses brought forward		+	+	+	+	+
(11) Distributable equity cash-flows		$D_1(1-d)$	$D_2(1-d)$	$D_3(1-d)$	etc.	etc.
(12) Less External equity finance		E_1	E_2	E_3	etc.	etc.
(13) Shareholders' cash-flow stream		$D_1(1-d) - E_1$	$D_2(1-d) - E_2$	$D_3(1-d) - E_3$	etc.	etc.
<i>Operating cash-flow statement (subheading (2))</i>						
	End Year	1	2	3	etc.	etc.
(i) Sales receipts		+	+	+	+	+
(ii) Materials		-	-	-	-	-
(iii) Labour		-	-	-	-	-
(iv) Works overhead		-	-	-	-	-
(v) Administrative overhead		-	-	-	-	-
(vi) Selling overhead		-	-	-	-	-
Transfer to (2) above		+	+	+	+	+

$$W_0 = \frac{D_1(1-d)-E_1}{(1+k)} + \frac{D_2(1-d)-E_2}{(1+k)^2} + \dots$$

Notation. W_0 = objective function. k = cost of capital. d = personal tax rate of shareholders. E_1, E_2, E_n = new external equity finance. D_1, D_2, D_n = distributable equity cash flows.

past, present and future financial performance. This ambitious framework is made up of two interlocking cash flow statements which are shown in TABLE 1.

It is evident from this table that the two sections making up the cash flow statement are similar in form and content to the conventional balance sheet and profit and loss account. The top half of the statement can be likened to the balance sheet, and the operating cash flow statement to the profit and loss account. This similarity goes deeper in that both the conventional balance sheet and profit and loss account and the cash flow statement represent outstanding balances at a particular date and that these balances have accrued over the same period of time, ie the accounting period. This similarity is more apparent than real because, as is well known, the conventional statements are a mixture of cash and accruals, whilst the balances in the cash flow statement are made up of only the former. What is the time period to be covered by these statements? At the moment between five and six years prior to the current period and the forecast for the future should cover between seven and ten years.

The next point concerns the shareholders' cash flow stream which is a residual that remains after deducting new equity finance raised during the year and retentions from the distributable cash flows. This figure is then inserted for each year covered by the statement, into what is referred to in his writings, as an objective function and discounted by the company's cost of capital. Lawson claims that by making an allowance for the time value of

money, his cash flow model is consistent with economic and financial theory.

3. THE LEE SYSTEM

Although there are similarities between the work of Lawson and Lee there are also important differences. Lee argues that utility and relevance should govern the measurement and communication of accounting information. The criterion for deciding the relevance and utility of accounting information is that it should satisfy the information needs of the potential user, or more specifically, it should be capable of influencing his decisions and actions. Users would still receive the conventional historic cost accounting, but their role in the financial reports would be that of authenticating managements' stewardship. It is then asserted by the author that stewardship information appears less relevant and useful to the investor than cash flow information. This assertion is justified on the grounds that cash is a key resource of the company and is vital to the company's continued existence. In addition, since the value of shareholding or potential interest is linked to the company's continued existence it is argued that users should receive information about the company's past and future, which is cash flow orientated. A stronger argument for users receiving information about future cash flows, which was also put forward by Lawson, is that it would enable users to form an opinion on the level of future dividends. It is difficult to fault these arguments and clearly users' decisions about alternative investments would be helped considerably if this information were available.

This raises a more fundamental question as to how this information could be provided. The author asserts that cash flow forecasts should be as formal and credible as possible and that uninformed guesswork must be avoided at all times. Whilst the latter statement is true, it is not very helpful, because it does not tell the compiler how forecasts could be made as formal and credible as possible. To be fair, whilst the author does not discuss this latter point in detail he does suggest general guidelines to be followed by compilers of cash flow forecasts. These statements should satisfy amongst other things three main needs which are to:-

1. Predict dividends and other benefits receivable by him from a company.
2. Predict its future survival, maintenance or expansion.
3. Predict the degree of risk and uncertainty connected with an existing or potential investment in a company.

Whether cash flow statements based on forecasts can satisfy these three needs adequately is an empirical question but given the present state of the forecasting art it seems very doubtful.

As mentioned earlier Lee's suggested scheme of financial reporting would retain the conventional historic cost accounts for the purpose of satisfying the stewardship function. In addition there would be a number of individual cash flow statements, the balances of which would be taken to what Lee refers to as a 'statement of total cash flow'. The separate

statements would analyse cash flows relating to specific aspects of the company's business, such as operations, taxation, extraordinary items and also financial and capital transactions. These forecasts would eventually cover a four to five year period at the most, although Lee suggests that at the moment only a three year forecast would be possible. This information would be subject to continuous reassessment and so account would be taken of significant events which have affected the original forecast. However one must inevitably question whether information relating to such a time span could be provided with any degree of accuracy and reliability.

In support of cash flow statements mentioned above, Lee recommends that there should be a statement which outlines in general terms the assumptions underlying the cash flow forecasts. These would cover such things as the company's sales policy, its pricing policy and the economic, political and social conditions the company expects to face in the period covered by the forecast.

A further statement would also be prepared that explained the material variations between actual and forecasted cash flows. This would be divided into those factors which were outside the company's control, and those factors which were within the company's control. Unfortunately no guideline is given about the criteria to be used in deciding which category a variance falls into.

It was stated above that separate cash flow statements would be prepared for each aspect of the company's activities. The balances on each statement would then be taken to a

statement of total cash flow. An example of such a statement is shown in TABLE 2 overleaf. ³

Lee argues that these statements and in particular the total cash flow statement, will enable the user to:-

1. Assess whether the company can generate sufficient cash resources to survive in the long run.
2. Judge whether the company will be able to accumulate sufficient cash resources to pay satisfactory dividends, in addition to its interest obligations.
3. Compute the company's interest and dividend cover which can be calculated by comparing 7 and 8.
4. Calculate (from 2 and 3 above) figures for distributable cash per share, as well as distributed cash per share. As a performance measure this would enable comparisons to be made with alternative investments.
5. Compare the contribution made by cash generated from operations and externally to meet capital, tax and dividend requirements.

4. THE ADVANTAGES OF CASH FLOW ACCOUNTING (CFA)

1. Managements' view of the future will be projected. This is of considerable importance to investors who are concerned with evaluating the desirability of being part of that future. It is difficult to fault this argument since what Lee is arguing for is information which we do not currently receive. Such a plea for more information about the future is to be welcomed and encouraged.

2. The 'price/discounted flow' ratio. This is computed

by dividing the stock market price per share by the discounted cash flow per share. The latter figure would be the net figure which remains after the shareholder had discounted back the projected cash flows to present values, at a rate of interest regarded as reasonable for that type of company. It is argued that this rate would be a more reliable investment indicator than the present 'price/earnings' ratio, because of the arbitrary allocations used to compute the present earnings per share figure. Quite what significance the price/discounted cash flow per share is intended to indicate the author does not discuss and it is difficult to see what purpose would be achieved if this ratio were computed. If the market's expectations and capitalisation rate equalled both the company's estimate of its future cash flow and the rate of interest regarded by the investor as reasonable for the company, this ratio would equal one.

3. Cash flow accounting would avoid all the arbitrary allocations currently made in historic and replacement cost accounts. Although this is true it solves the problem by walking round it. A correct measure of income is important both from the viewpoint of monitoring the economic progress of a company and also because in a mixed economy there is a need for a yardstick which society can use to judge the success or otherwise of a particular business. Income measures are important because they are a guide to how the company has performed in the past and how it is likely to perform in the future. Cash flow accounting tells the investor very little about profit margins, how

quickly assets are being turned over, gearing or how many times interest is covered. These ratios are an important guide to performance.

4. Cash flow accounting retains money as the unit of measurement and so automatically incorporates specific price changes. This is quite an important advantage as certain of the suggested alternative accounting systems, for instance current purchasing power (CPP), use different units of measurement.

5. Investors could see from the projected cash flows the ability of the company to pay its way in the future and also its planned financial policy. Too much emphasis must not be placed on the availability of cash, since capital market theory predicts that if the ultimate profitability of the project is sufficiently high, a company could always fund any short term contingency. Having said this, it is clear that such information would be of considerable use to the investor and whilst it is obvious that this is one of the strong points of cash flow accounting, its importance does need modifying.

5. DISADVANTAGES OF CASH FLOW ACCOUNTING

1. The ability of management to make accurate forecasts in conditions of rapid technological and economic change. Since this point has been discussed earlier, no further elaboration seems necessary.

2. The interest rate to be used for discounting. The author suggests that in order to retain objectivity, management should be required to disclose a rate of

interest necessary to at least maintain its financial position. This rate will approximate the anticipated deterioration in the general purchasing power of money. Investors would then make a separate evaluation based on their expectations of the business' potential, over and above the minimum necessary to maintain its financial position. It would seem that these calculations are unnecessarily complicated. If the company publishes its cost of capital using capital-asset pricing techniques no problem arises. This is because the company's cost of capital will reflect the risk free rate and the risk premium for the project or projects it undertakes.

3. The danger of giving competitors information about the company's plans. This statement can be turned on its head if it can be established that the overall allocation of resources would be improved. Lee implies this in a subsequent sentence, but it seems that an important point has been missed. If all quoted companies were required to disclose this information, our overseas competitors who would have full access to this information would be given an unfair advantage. If cash flow forecasts were introduced, there would have to be exemptions for companies who had substantial overseas interests, or who competed with imports on the home market. Apart from the potential harm to the persons referred to in the previous sentence, it is an empirical question whether overall resource allocation would be improved if these forecasts were mandatory and it seems that arguments could be advanced either way as to whether resource allocation would be improved. Whilst the

dangers of publishing this information must be recognised, it can hardly be regarded as a major disadvantage and it may in fact be to society's overall benefit.

4. Management might try to influence their market rating by over or under estimating expected future cash flows. Whilst the market would become aware of systematic over or under stating of future cash flows when reported cash flows become known, in the intervening period it could mislead investors. To some extent the objectivity of the forecast could be verified, as the author states, by experts as regards the non-accounting part and professional accountants as regards the accounting part. There would still be a grey area although this disadvantage should not be overstressed. The information which the market uses to estimate future cash flows comes from a number of sources and so the cash flow forecast, although important, would only be one of the sources used by the market. Whilst the market's rating of a particular share could be altered in the short run, as new information became available to the market the share price would move accordingly.

5. The difficulty of using this type of financial information to assess managerial efficiency. There is no yardstick by which to judge whether cash flows are attributable to managerial action or fortuitous circumstances.

6. CONCLUSIONS

In conclusion it can be said that it is difficult to disagree with the Sandilands Committee⁴ comments on cash

flow accounting, which were to the effect that they felt there was much of value in the cash flow accounting principle but doubted whether such a fundamental change would be acceptable to British companies at the present time. Further research in this promising area should concentrate on both the theoretical and empirical aspects of cash flow accounting. As has been shown in this chapter, the theoretical basis is far from satisfactory and if cash flow accounting is to be made operational one priority must be the development of satisfactory performance measures which would facilitate both inter-firm and inter-period comparisons. Having said this it is difficult to see how such measures could be devised, since cash flow accounting, as implied by its name, focuses on liquidity, rather than on income measurement. As such, cash flow accounting would be of considerable use to investors in helping them assess future performance, but it would be of little use in appraising past performance. However, a correct income measure would enable the investor to make reliable judgements on past and inter-firm performance. Cash flow accounting and income measurement, therefore, answer two different though related questions and should be regarded as complementary, rather than alternatives, to each other.

On the empirical side ⁴ neither Lee nor Lawson has to date published any findings on the effects or otherwise of cash flow accounting. To be fair, very little field work has been done on the alternative accounting systems which have been suggested, such as current replacement cost accounting and market value accounting. If cash flow accounting is to become operational, more must be known about

the problems of introducing it and how it will affect the decisions of both investors and managers. It is hoped that further research will take place into cash flow accounting, especially on the lines suggested in this paper, since this particular system of accounting has considerable potential as yet unrealised.

R E F E R E N C E S

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2. LEE T A A case for cash flow reporting
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THE ACCOUNTANTS' MAGAZINE (January 1972)

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3. This table has been extracted from
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JBF (Vol 4 1972) p 33

4. REPORT OF THE INFLATION ACCOUNTING COMMITTEE
Chairman F E P Sandilands
HMSO Cmnd 6225 (September 1975)

5. Professor Lawson, in private communication has
indicated that he has installed cash flow accounting
in several companies and that the evidence which he
has collected is presently under review.

6

REPLACEMENT COST ACCOUNTING

(R C A)

1. Introduction
 2. The main theoretical contributions
 3. Technological change and the segregation of
Operating Profits from Holding Gains
 4. Advantages and Disadvantages of Replacement
Cost Accounting
 5. Conclusions
- References

1. INTRODUCTION

Support for Replacement Cost Accounting (RCA) amongst academic accountants is closely linked to the major theoretical contributions of Edwards and Bell ¹, Solomons ² and Revsine ³. Whilst there are similarities in their writings each writer has made a distinctly separate contribution. In the next section of this chapter these contributions will be reviewed. Although their writings have been extremely influential, important contributions have also been made by Baxter ⁴, Mathews ⁵ and Gynther ⁶. These contributions will not be reviewed as to a large extent they follow the major theoretical contributions. The Third Section will examine the criticisms of RCA and in particular the problems of technological change and the dichotomy between operating profits and holding gains. Section Four will review the advantages and disadvantages of RCA to the extent that they have not been specified in the section dealing with the major contributions. Section Five will conclude by briefly reviewing the main points of each section.

2. THE MAIN THEORETICAL CONTRIBUTIONS

2.1 Edwards and Bell

Probably the most quoted book in accounting theory, is the seminal work of Edwards and Bell. ⁷ Their book brings together the economists' subjective view of income and the accountants' insistence on verifiable measurements. They see accounting as having two functions:-

- i) to provide useful information of past business decisions; and

- ii) the provision of data for a sound and equitable basis for taxation.

This review will concentrate on i). Edwards and Bell reason that the results of past business decisions are studied by management in order to improve subsequent decisions; and by outsiders such as shareholders to evaluate management.

They recognise that no single concept of profit is best for all possible uses, or even for the limited uses suggested by the functional view of accounting. Consequently, their theory concentrates on relatively few basic components of profit, which can be aggregated in various combinations to measure differently defined profits.

The two main profit concepts developed by Edwards and Bell were realisable profit and business profit. The former was based on opportunity costs - exit prices and the latter on current costs - entry prices. Exit prices were rejected on three grounds and these are set out below.⁸

1. Their use lead to anomalous revaluations on acquisition because of transport costs, installation and removal charges, and imperfect access to markets. Immediately upon the purchase, delivery and installation of a new machine or truck its net realisable value is normally substantially less than acquisition cost.

2. Their use implies a short run approach to business operations posing, as they do, disposition and liquidation values for the positions statement. A positive realisable profit only indicates that it is worth staying in business in the short run, not that it is worth replacing assets and inputs and staying in business over the longer term or as long as current price relationships continue.

3. Their use leads to the anticipation of operating profit before sale by valuing finished goods, and possibly nearly finished goods, in excess of the current costs incurred in their production.

Current costs were chosen as the entry price because they represent the costs of providing the inputs included in the output at the point of sale. This enables management and shareholders to appraise the profitability of a business on the basis of costs at the moment of sale, rather than based on some outdated cost such as HC. The difference between sales and the current cost of the goods sold was labelled current operating profit and the difference between the HC and current cost of the goods sold was labelled a holding gain.⁹ Taken together these two gains were referred to as business profit. Edwards and Bell¹⁰ justified this dichotomy on the following grounds:-

'These two kinds of gains are often the result of quite different sets of decisions. The business firm usually has considerable freedom in deciding what quantity of assets to hold over time at any or all stages of the production process and what quantity of assets to commit to the production process itself. The opportunity to make profit through holding activities, that is, by holding assets while their prices rise, is probably not such an important alternative for most business firms as is the opportunity to make profits through operating activities, that is, by using asset services and other inputs in the production and sale of a product or service. The difference between the forces motivating the business firm

to make profit by one means rather than by another and the difference between the events on which the two methods of making profit depend require that the two kinds of gain be carefully separated if the two types of decision involved are to be meaningfully evaluated.'

Another, though somewhat related, reason for segregating these two types of gain is set out below. ¹¹

'Even if the primary or sole objective of the business firm is to make a profit through its operating activities alone, it is still necessary to isolate the effects of holding activities, incidental though they may be. If this is not done, the effects of these holding activities will be confused with the effects of the firm's operating activities, making any meaningful evaluation of the firm's production decisions difficult if not impossible. Suppose for example that a firm expects to make \$100 in the absence of price changes by pushing a group of inputs through the production process to final sale. If, during the period necessary for production to take place, the prices of the firm's inputs (already acquired) and outputs rise, the final profit reported according to present accounting procedures will be partly a result of holding activities and only partly a result of operating activity. The apparently favourable results of the production decision may lead the firm to make similar production decisions for the future. In this case, however, price changes may not occur, and gains from holding activities will not inflate reported operating profit.'

To summarise, business profit was equal to:-

Business profit = current operating profit + realisable cost
savings

or where applicable

= current operating profit + cost savings
and capital gains

The use of current costs in the profit and loss account implies that fixed assets and stock will be reported at current cost, which in most cases will be current replacement cost, in the balance sheet. The realisable (or for that matter realised) cost savings have often been referred to in the literature as holding gains (HGs).

Edwards and Bell ¹² claim that the concept of current operating profit (COP) not only facilitates a realistic approach to current profitability but also enables management to assess:-

- i) whether the firm should continue in the long-run:
a firm will only continue to produce in the long-run if current operating profits are greater than the interest on the current cost of the firm's assets at the beginning of the year;
- ii) the relative profitability of alternative production processes;
- iii) future profits of existing production if conditions are expected to remain the same: they do concede that in many cases this will be an unrealistic assumption;
- iv) future relative profitability of alternative production processes unless there is a substantial change in the underlying processes in the future.

In terms of external appraisal the authors claim that:-

- i) the extent that security prices are based on long-run profit considerations COP is a more realistic indicator than say realisable profit, or HC profit;
- ii) potential entrants will be able to realistically assess the relative profitability of an industry if current operating profits and net assets are both reported at current cost; from the potential entrants point of view COP is an indicator of long-run profitability and the current cost of the net assets an indicator of the capital needed to enter the industry.

Edwards and Bell then argue that for tax purposes, dividend policy, wage claims and inter-temporal comparisons account has to be taken of changes in the general price level. As the COP figure is in current purchasing power terms it is only necessary to adjust the holding gains and shareholders' funds. The resultant combination of COP and adjusted holding gains is referred to by the authors as 'real business profit'.

Their book converted many academics and their influence can be seen in a research study by Sprouse and Moonitz¹³⁴ on basic principles and the American Accounting Association's statement on Basic Accounting Theory.¹⁴ Predictably Chambers¹⁵ has criticised their work. His principle criticism is that COP takes no account of the various possible alternative uses to which the inputs incorporated in sales could be put. Most of the article is devoted to a defence of realisable profit which Chambers supports and which Edwards and Bell reject.

2.2 Solomons

Whereas Edwards and Bell focus their attention on the income statement, Solomons¹⁶ focuses on asset valuation. This implies that in the Edwards and Bell framework the balance sheet is very much a secondary statement whereas Solomons places more emphasis on the balance sheet and the income account as a derivative of the former.

The centre piece of Solomons' contribution is the concept of value to the owner. He argues that the concept of value to the owner was first put forward by Bonbright¹⁷: he defined it as 'The value of property to its owner is identical in amount with the adverse value of the entire loss, direct and indirect, that the owner might expect to suffer if he were to be deprived of the property.' Solomons¹⁸ then asserts that in general this loss will be equal to an asset's expected net present value: after noting the subjectivity inherent in this value he then asserts that the concept would be too subjective, (following Solomons) 'if it could not be quantified objectively, at least within tolerably close limits'. These 'close limits' being, on the upper side, replacement cost and on the lower side, net realisable value: the underlying logic being that an asset cannot be worth less to its owner than he could sell it for and that the loss he would sustain on deprivation could not be greater than the cost of replacing the asset, or its services.

Solomons¹⁹ then examined the six possible relationships between RC, NRV and PV

1. $NRV > PV > RC$ ²⁰
2. $NRV > RC > PV$
3. $PV > RC > NRV$
4. $PV > NRV > RC$
5. $RC > PV > NRV$

An asset should be retained for use only if its $PV > NRV$; consequently cases 3, 4 and 5 above form a 'use' group and 1, 2 and 6 for a 'resale' group. All NRV's were eliminated from the 'use' group as irrelevant (sale is not an option which would be chosen) and all PV's were eliminated from the 'resale' group as similarly irrelevant. An upper limit on the value of an asset to the owner is set by its current replacement cost, assuming that immediate replacement is possible, for the loss from deprival cannot exceed the cost of replacement. The measured loss from deprival in the six cases can now be simplified as follows

<u>Use</u>	<u>Resale</u>
3. RC	1. RC
4. RC	2. RC
5. $RC > PV$	6. $RC > NRV$

In case 5. the asset would not be replaced if lost and so its value to the firm is its PV. In the case of 6. the asset would not be replaced and NRV was selected. This leads to the following valuation rule:

Value to the firm = RC, except where $RC > PV$ or $RC > NRV$, when value to the firm = PV or NRV, whichever is the greater.

Solomons ²¹ concluded that in most cases current replacement cost will be the relevant measure of value to the firm.

This analysis has been accepted, though sometimes with reservations ²² by a number of leading academic and practicing accountants. These reservations have centred around three main issues.

1. The value of assets which are an indispensable part of a larger asset; Bonbright ²³ cites the case of one glove in relation to a pair of gloves. Solomons ²⁴, Edey ²⁵ and Baxter ²⁶ have referred to a number of railway analogies; these have usually involved considering a small part of a railway system, eg a tunnel or a specialised engine spring; the value to the owner of such assets should they render the line unworkable, is the income attributable to the line. Clearly if every asset of the line were valued on this basis, the total would be a meaningless aggregate.

2. A refinement of the aggregation problem ²⁷ referred to in the previous sentence. The problems raised under this heading are discussed briefly below:-

- i) The meaning which can be attributed to a balance sheet total for any particular category of asset: for instance, if plant and machinery is considered, the balance sheet total may be a mixture of, or combination of, realisable values, replacement cost and expected net present values. Further, the aggregate value will depend on the level of aggregation - the value at the individual level will differ from the collective value of all the firm's assets.
- ii) Staubus ²⁸ has made the point that if net realisable value and replacement cost are used as surrogates for an asset's expected present value, the addition of

these different measures makes adjustment for systematic bias more difficult.

iii) Ijiri ²⁹ has shown that one of the requirements of a number system is that it should be mathematically consistent; this is used to support the hypothesis that only historic cost accounts meet this requirement, as the numbers it generates are of the same vintage, whereas the other systems use numbers of various vintages in the aggregation process. Amey ³⁰ has pointed out that mathematical consistency does not of itself imply economic consistency; as it is the latter most accountants are concerned with, it is not a necessary condition that the numbers it generates should be axiomatically consistent, although this would be a desirable feature of any number system.

3. Chambers ³¹ has examined Bonbright's original treatise and definition in some detail: he has made the following points.

- i) Bonbright's work was concerned with the valuation of property in relation to the regulation of public utilities and litigation. The treatise is not concerned with accounting; the only references to accounting are some observations Bonbright made about accountancy practices.
- ii) Whilst Bonbright's treatise discussed many possible indicators of value to the owner, no systematic values were formulated which could be applied in any given situation. Chambers forms the view that whilst there was ambiguity as to the appropriate

valuation base, Bonbright's definition seemed most consonant with expected net present value.

iii) The appropriateness of an asset valuation based on a hypothetical deprival: is the loss of an asset such a common place event that every balance sheet of every company should use such a base? In Chambers' experience, and no doubt most other peoples, losses by fire, tempest and sequestration etc are such rare events, that loss on deprival seems a strange basis of asset valuation in accounting reports.

Despite these criticisms this concept has found widesprad support in the UK from both academic accountants and the professional accounting bodies. ³² We now turn to the third major contribution, that by Revsine.

2.3 Revsine

Revsine's ³³ approach differs from that of Edwards and Bell and Solomons in that it focuses primarily on the ability or otherwise, of replacement cost accounts to predict future cash flows. In the process he has attempted to justify Edwards and Bell's unexplained transition from economic income to business $\bar{\text{income}}$. Having selected long-term equity investors as the user group he assumed a decision model derived from finance theory and approved by a committee of the American Accounting Association. ³⁴

$$V_0 = \left(\sum_{i=1}^n \frac{D_i a_i}{(1+\beta)^i} + \frac{I_n a_n}{(1+\beta)^n} \right) - I_0$$

Where:

V_0 = subjective net present value of one equity share purchased at time 0 at price I_0 .

D_i = dividend per share expected during period i

a_i = a factor to adjust for uncertainty; if the investor is risk averse $0 < a_i < 1$

β = opportunity rate of discount for a risk free investment

I_n = expected value of this equity share at the end of the planning period, time n .

This model is an expanded version of the present value algorithm. He assumed that the function of accounting information was to provide:-

- i) a lead indicator, because it impounds exogenous factors;
- ii) a basis for extrapolation, because the data incorporates endogeneous factors.

Revsine then demonstrates that replacement cost income equals economic income in a perfectly competitive economy. Economic income is then separated into two components:-

- i) expected income; and
- ii) unexpected income

arising out of changes in expectations.

Revsine equates expected income to Edwards and Bell's COP and unexpected income to those authors' 'realisable cost savings'. Because the capital maintenance assumption of the economic model postulates the distributability of expected income, the use of replacement cost enables an estimate to be made of the D term in the valuation model.

This is not the place to list the many assumptions which are necessary to deduce the implications of a perfectly competitive economy. While the invalidity of any one of them might not be critical, the fact that they are virtually all irrelevant to the conditions under which accounting is performed renders untenable inferences such as those drawn by Revsine. There is no justification for his conclusion that 'current operating profit' is merely an approximation for expected income in an imperfectly competitive economy.³⁵

The extrapolation approach argues that COP is the best estimate of future COP; and future COP is a surrogate for future distributable (cash) flow. This argument confuses the function of the income statement with that of the statement of changes in financial position. It is from the latter that extrapolation of this kind can proceed. In addition, no attempt is made in this approach to deal with the role of holding gains and losses (Edwards and Bell's realised and realisable cost savings) in the extrapolation function. There is no evidence that COP or business income or any other economic construct of net income is useful in predicting cash flow to the long-term equity investor.

3. CRITICISMS OF REPLACEMENT COST ACCOUNTING

This section will examine two major criticisms that have been made of RCA - its failure to recognise technological change and the rigid dichotomy that is made between operating profits and holding gains.

3.1 Technological change

In this connection a problem arises when an asset, which is still being used in the production process, is superseded in the market place by a newer and improved model which renders the old model obsolete. The question then arises as to how the current market price of the expired services should be measured.

Edwards and Bell ³⁷ suggest that expired current costs be measured in terms of the current cost of the actual model used in production. This is justified on two grounds:-

- i) management requires a measure of the profitability of existing operations; and
- ii) such information is necessary for evaluating replacement possibilities.

This view has been criticised. For instance, Lemke ³⁸ has raised the provocative issue of COP and its predictive ability when the assets used in production are subject to technological change.

'The claims that 'current operating profit' evaluates the existing mode of production remains valid, but the primary interest is in the long-run prospects of the firm, and there seems to be no particular reason why these long-run prospects would be indicated by the prospects of the present mode of production, when it is becoming obsolete.'

This point is obviously valid but raises the question - should accounting measurements be based on the assumption that the firm continues to use existing techniques, or should they incorporate the newer techniques?

Edwards and Bell opt for the former. From a practical standpoint this is a defensible position. To base accounting measurement on some course of action the firm might never take could be very misleading and would require someone to forecast what investment decisions a firm is likely to make in the future. This approach is not in keeping with traditional thought regarding the appropriate role of accounting information. Revsine³⁹ in a recent paper, has shown that in many cases the current cost of the 'old' asset will be economically equivalent to the replacement cost of the technologically improved 'new' asset.

Revsine⁴⁰ has also examined the impact of technological change on RC information used by investors to predict future cash flows. He concluded that when technological change alters the rate of return earned by manufacturers, equipment users are the beneficiaries of the technological change and RC income may not be a good lead indicator of the firm's future operating flows. However, this was not the case when consumers or equipment manufacturers gained the benefits of technological change: in this case RC income was a good lead indicator of the firm's future operating flows.

However, it is difficult to disagree with the comments of Edwards (of Edwards and Bell) on this problem.

'I confess to being less than happy with the discussion Phil Bell and I offered on this matter (1961 chapter 3) and also with those I have read since.'⁴¹

3.2 Operating profits and holding gains

Rosenfield⁴² has criticised RCA because it misuses

'counter factual conditionals' (to use Rosenfield's term). That is, the dichotomy between holding gains and operating profits is dependent on conditions that by definition are contrary to fact. A cost saving is the difference between the amount that would have to be paid currently to acquire the asset had it not been acquired in the past minus the amount actually paid. Current operating profit is the excess of the proceeds received over the amount that would have to be paid currently for the asset used or surrendered had it not been acquired in the past.

As stated in the opening chapter, Drake and Dopuch⁴³ have questioned the legitimacy of rigidly distinguishing operating profits from cost savings (holding gains). These authors suggest that when a firm is actively speculating in price changes it is not possible to evaluate the success alone. This deficiency is further compounded by the fact that speculation often involved expenses which, following normal RC principles, would be deducted from COP. They also point out that realisable cost savings in this situation are made up of two elements:-

- i) the cost saving on average inventory, the inventory it would need to purchase irrespective of speculation; and
- ii) the cost savings attributable to the difference between actual and average stock.

The authors⁴⁴ then extend this analysis to fixed assets and cite US Steel's decision in 1952 to build a capital-intensive steel works. From a strict rate of return point of view, using then prevailing prices for capital and labour,

the investment could not be justified. However, the plant was felt to be economically justifiable given the increases in labour costs that were expected over the next decade. In retrospect, the forecasts were accurate. Labour rates did rise appreciably over the period and to such an extent that the plant was economically justified. Over the same period the price of the plant rose, no doubt attributable in part to the savings generated by the substitution of capital for labour.

In terms of the RC accounts this decision would be recorded as follows. As asset prices (the plant in this case) rose the benefit would be recorded as a cost saving. However, the costs of this policy would be reflected in COP: this is because in relation to output fixed costs were higher than they needed to have been: in later years total operating costs were less than those that would have been incurred in a less mechanised plant. It is clear from this discussion that the cost savings component does not fully reflect the costs and benefits of the decision to speculate in the acquisition of labour saving equipment.

It should be noted that Drake and Dopuch are not arguing for the rejection of RCA but are merely suggesting that one of the reputed advantages may be illusory.⁴⁵ The examples cited by these authors in their paper illustrate that when a firm actively speculates, the two income components are so interdependent that the data needed to evaluate such decisions must be extracted from both components.

The next section of the chapter will examine the various advantages and disadvantages that have been claimed for RCA.

4. ADVANTAGES AND DISADVANTAGES OF REPLACEMENT COST
ACCOUNTING

4.1 Advantages ⁴⁶

1. The real trading profit of a business is shown in the accounts. This profit is 'real' in the sense that the physical capital of the business remains intact. The key ratio of profit to capital employed will be more realistically computed and so both management and shareholders will have more meaningful information on which to make decisions.

2. As a corollary of this since current cost information will be readily available to management, decisions on such things as capital expenditure, or 'make or buy' problems, should be easier to make.

3. Realistic pricing decisions can be made by the firm where it is a price 'leader' rather than a 'taker', as current cost information will be available on which to base these decisions. Where the firm is a price 'taker', the current cost information will enable management to decide whether adequate margins are being achieved. In contrast to historical cost accounting, replacement cost accounting makes decision making less hazardous.

4. The public relations of many companies would improve. Many laymen are confused by large HC profit figures and high dividends based on HC capital structures. RCA would give him a better idea of the real situation.

5. HC exacerbates the trade cycle. This is based on the assumption that investment and spending (as a result of high dividends) are higher when reported profits are high and lower when reported profits are low. Gynther claims

that:

'the production of real current information can only assist in the creation of the right business climate at the right time, and this is most important in our private enterprise type economy.'

6. The allocation of resources would improve. RCA prevents the over-paying of dividends in times of rising prices and vice versa. If many firms paid out dividends in excess of real profits over a number of years, their weakening condition is likely to result in instability in the private sector. Costs expressed in current prices would enable decisions, which are more correct (from a resource allocation viewpoint) to be made concerning tariffs, government fixed prices and wage awards in various industries.

While the first three advantages have considerable substance, the other three are little more than assertion and speculation.

4.2 Disadvantages of RCA

Two of the main disadvantages of RCA were discussed in the previous section - the RC of assets which are subject to technological change and the rigid dichotomy between operating profits and holding gains. However, three others have been referred to in the literature.

1. The assessment of current replacement cost lacks objectivity. Opinions on current replacement costs may differ and the system can allow management to manipulate reported profits. Since in a number of cases the current replacement cost cannot be independently verified this

system of accounting has faced hostility from practising accountants.

2. Replacement cost accounting shows how the prices of specific assets used in the business have changed. As such it is not a technique of inflation accounting since it is concerned with how prices have affected the affairs of the individual business. For instance, replacement costs may change when there is no general price inflation, as a result of changes in supply and demand.

3. Where a firm operates in an inflationary environment and adopts replacement cost accounting the accounts of any particular year will not be comparable with other years. This is because each set of accounts will be expressed in terms of specific purchasing power.

From an accountant's point of view the first disadvantage is very important. The second and third disadvantages are, as we saw in the chapter dealing with this system, the main advantages of CPP accounting. Having reviewed the main advantages and disadvantages of RCA, the next section will review the main findings of each section.

5. CONCLUSIONS

The earlier part of this chapter showed that RCA has considerable theoretical underpinning and was closely associated with three writers. Each writers' views have been criticised. The Edwards and Bell rejection of exit prices and their preference for entry prices has been criticised on the grounds that it takes no account of the firm's ability, or otherwise, to adapt to changing business conditions. Solomons' approach has been criticised because of the unrealistic nature of the

value to the owner concept. Revsine's lead indicator has been criticised on the grounds that there is no evidence for his conclusions that COP is useful in predicting future cash flows. It was found that, apart from the theoretical weaknesses, RCA had other deficiencies. To date no satisfactory solution has been found to the problem of technological change and the valuation of 'old' assets and that where management actively speculated, COP was understated and HGs were overstated. The main advantage of RCA was the improved quality of the information provided to management and investors and its main disadvantage the failure to recognise the effects of changes in the general price level.

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7

FINANCIAL REPORTING
IN THE NETHERLANDS -
THEORY AND PRACTICE

1. Introduction
2. Limperg's contribution
3. Post-war contributions to the debate
4. Post-war Economic and Institutional
influences
5. RVA and Sound Accounting Practice

APPENDIX I An Extract from the Annual Accounts

II Considerations of the Tripartite
Committee

This chapter of the thesis will examine the theoretical and practical framework of Dutch Financial Reporting. The purpose of this analysis is to put the empirical evidence this writer has collected into perspective. This review cannot claim to be entirely original, as much of what follows has been published in Holland. However, to date, only a few articles have appeared in the English speaking journals on accounting thought and developments in the Netherlands. The coverage of these articles is quite naturally spasmodic and by no means comprehensive. The aim of this chapter is to remedy this deficiency and in synthesising the Dutch literature I have been greatly assisted by Drs W van Bruinessen, a partner in a large firm of accountants in Holland and a past president of the Dutch Institute of Chartered Accountants.

This chapter is organised as follows: Section One will outline the early influences on Dutch accounting. Section Two reviews the contribution of Theodore Limperg; Section Three will review the post-war contributions to accounting thought in the Netherlands; these two sections will overlap as Limperg's views have only become more widely known in the post-war period: Section Four outlines the post-war economic and institutional influences on financial reporting: this will also include a brief note on the influence of tax legislation on financial reporting practices: Section Five reports on the discussions I have had with Drs van Bruinessen on why RVA is a sound accounting practice: the concluding section will discuss the implications of this review for the survey results discussed in the next two chapters.

1. INTRODUCTION

In contrast to the English speaking world, the development of accounting theory and practice in the Netherlands has been largely unaffected by accounting practices and developments elsewhere. Although the development has been mainly insular this has not affected its progress and the advanced reporting practices followed by many of its leading companies are indicative of this progress.

The early development of accounting in Holland can be attributed to Stevin, who not only examined the Paciolian system of book-keeping but went further and developed a general theory of debit and credit transactions. This general theory was published in 1605 in a book called 'Mathematical Traditions'. Another major influence was the trading activities of the Dutch East Indies Company which was formed in 1602. This necessitated the compilation of periodic accounts for the benefit of the shareholders who had committed funds to the company. As in other countries, with the growth of the corporation, rules (or what might be called accounting principles) had to be devised which would facilitate the distinction between capital and revenue and so enable a calculation of periodic income to be made. Again, in common with other countries, until the beginning of the twentieth century, these rules were loosely knit and based on experience gained from practice. It is clear from this introduction, that whilst the influences on the development of early Dutch accounting were the same as in the other industrialised countries of the period, the insular development can be attributed to Stevin's work and the impetus given to

financial reporting practices by the Dutch East Indies Company.

2. A REVIEW AND CRITIQUE OF THEODORE LIMPERG'S
CONTRIBUTION

Limperg began his accounting career in 1901 as an auditor and very soon his views came into conflict with those of other accounting practitioners. The early conflicts centred on his interpretation of the auditors' duties. He argued that these should not be limited to testing the books of account or to the practices suggested in the classic auditing texts of Dicksee and Pixley. Limperg argued that this view of the auditor's function was far too restrictive and that the balance sheet and profit and loss account should show the real financial position and results of the audited firm. As a result of these early conflicts he and some of his associates left the Netherlands Institute of Accountants in 1906 and established a rival organisation, the Netherlands Accountants Association. Limperg's influence grew and in 1918, largely as a result of his contribution to Dutch accounting practice, the two bodies were merged. Limperg's ideas were rapidly embraced by the merged body. Such was his influence that in 1927 he was appointed to the Chair in Business Economics at the University of Amsterdam ¹ a chair which he occupied until 1949.

Limperg's idea that financial statements should be more broadly based led him to develop a theory of business economics² which became the basis of his contributions to valuation theory and income measurement. His collected works ³ were not published until 1964 although his major contribution to income

measurement, Replacement Value Accounting (RVA), was the basis of an influential article ⁴ published in 1937 - 'The consequences of the depreciation of the Guilder for the calculation of value and profit for the enterprise.' A more comprehensive review of the theory of RVA can be found in his collected works, which are made up of seven distinct, though related, parts. These are listed below:-

Part I - Introduction and Value

(including Replacement Value Theory)

Part II - The Theory of the Supply Price

Part III - The Theory of Finance

Part IV - The Theory of External Organisation

Part V - The Theory of Internal Organisation

Part VI - The Theory of Auditing and Income Measurement

Part VII - The Theory of the Conditions of Employment

It is clearly beyond the scope of this thesis to deal with each part in detail and so attention will be focussed on the two parts which have a direct bearing on the preparation of financial statements; replacement value theory and income measurement.

2.1 Limperg's Theory of Value

Limperg rejected the 'marginalist revolution' of the 1870's and in particular, the subjectivist marginal utility school, as represented by Wieser, Bohm-Bawerk, Edgeworth and Marshall. The marginalist school argued that the value of a good was measured by its marginal utility. This implied that the value of a good, for which there are available substitutes, could not exceed the market price at the time of valuation.

Limperg's theory of value focusses primarily on cost. This is achieved by the notion of continuity,⁵ a concept whose nearest equivalent in the English speaking literature is the going concern basis. English translations, including verbal, make the concept difficult to understand and appreciate. Van Bruinessen⁶ has put it to me this way:-

'Once a certain amount of money is invested in an enterprise, the management of that enterprise is under constant pressure to safeguard the enterprise's continuity. When is economic continuity deemed to be maintained? Limperg has given an answer to this question when he stated that every transaction on the selling market creates an obligation to replace the productive capacity, as embodied in the goods sold.'

In effect, Limperg was saying that an important objective of the firm is to be able to continue operations in the long-run. He gave continuity a narrow construction. That is, the production of the same or similar goods. Technological improvements and changes in product mix were ignored. To ensure long-run continuity, the RC of goods and services consumed (the English translation of the word used in Holland is sacrificed) should be charged against sales revenue at the point of sale. RC is the correct measure of the goods and services sacrificed in the sale, as the firm can be restored to the position it was in just prior to the sale, by replacing the goods and services consumed at the moment of sale.

As Limperg's primary interest was in the preservation of continuity, he and subsequently his supporters, have paid little attention to the situation where RC is either greater

than NRV or EPV. The reason is self-evident. In both cases the future of the firm is in jeopardy.

When the flow of goods is interrupted, for instance, stocks and work-in-progress at the year end, RC does not express the economic significance the firm can attach to the goods. In this case the firm must value its goods at the price they will command in the market place ie net realisable value. As regards net realisable value, Limperg made a further distinction as between direct and indirect realisable value. Of the two values the higher of the two was the most relevant. This would usually be the former as regards the valuation of stock and the latter as regards the valuation of work-in-progress. By indirect realisable value, Limperg meant the proceeds that would be realised in the normal course of business, but it is not clear from his writings how this value should be computed. It has been suggested by subsequent writers that Limperg's writings imply that this value could be found by discounting expected sales revenues net of associated costs. A difficulty with this approach is how to allocate revenues and costs to individual means of production.

In most cases, as Limperg ⁷ notes, this problem is more apparent than real, as

'Usually, the indirect realisable value of the combined means of production, governed by the sale price of their products, is higher than their combined replacement costs. Usually, that is to say, for the profit-showing company, the combined replacement costs assess a specific contribution to the proceeds and to the income, from this it follows logically that the value of each means of production is assessed as its cost of replacement.'

Valuation problems could also arise in the following situations:-

1. The valuation of work-in-progress when the firm is making losses and there is no possibility that it will make a profit when the goods are transferred into finished goods.
2. Goods which are not marketable, or for which there exists no market: following Limperg, since $NRV < RC$, the value placed on the asset is likely to be negligible or zero, it could hardly be claimed that this value represents their worth to the business.

These two points, whilst important in specific situations, may be exceptions and do not necessarily invalidate Limperg's valuation rules.

Limperg's theory of value can be contrasted with that of the marginal utility school. Whereas Limperg would value assets at their replacement cost and only in exceptional cases at net realisable value, the marginal utility school would use the latter value almost without exception.

2.2 Limperg's Theory of Income Measurement

Whilst Limperg acknowledged that the problems of income measurement and asset valuation were closely linked, the preparation of annual accounts gives rise to another problem, the significance which should be attached to the difference between replacement value and historic cost. Does this difference represent a profit to the business, in the sense that it can be distributed to shareholders, or is it part of the equity shareholders' funds? Limperg resolved this

problem by developing a concept of profit which was also consistent with his theory of value. He argued that the aim of income measurement was to determine the maximum amount which could be distributed to shareholders, whilst still maintaining the source of income intact. In order to maintain the latter, he formulated three rules which should be followed when determining a company's distributable income:-

1. The realisation principle should be adhered to, so that there can never be profit without a sale.
2. If there is a favourable difference between replacement value and historic cost (this is referred to as a holding gain or cost saving in the English speaking nations) this should not be treated as a profit, either for goods sold or for goods on hand at the year end.
3. Where the difference between historic cost and replacement value was unfavourable this should be treated as a loss.

Where at the end of the accounting period the RC of an unexpired asset was in excess of its HC, the difference would be credited to a revaluation account which formed part of the equity shareholders' funds. Although the revaluation account formed part of the equity funds, these funds would not ordinarily be regarded as available for distribution, since any distribution would endanger the capacity of the business. Where the replacement value of the asset fell to below its historic cost, the difference would be debited to the revaluation account until the balance of this account is zero. Any further unfavourable differences are then charged directly to the profit and loss account. These differences, both favourable and

unfavourable, are most likely to occur in respect of non-monetary assets such as stocks and fixed assets.

It is in respect of treatment of the favourable differences attributable to stock that most of the problems arise. Suppose that towards the end of an accounting period management deliberately builds up stock, because it expects that its price will rise significantly in the coming year. If these increases materialise they cannot be attributed solely to holding activities, since it was the deliberate policy of management to increase stock levels. A part of this increase can be regarded as trading income, since it reflects gains attributable to the speculative activities of management. In theory this dichotomy is satisfactory but the practical problem of identifying these two types of gain remains. The theory has therefore had to be amended in order to separate out these gains, by recourse to a concept of 'normal stock'. This is the quantity of stock which enables a company to maintain its production process without disturbance. The volume of stock attributable to the speculative activities of management is the difference between the volume of stock on hand and the 'normal stock'. Only price variations attributable to the latter are taken to the revaluation account and price changes from speculation, either as a result of stock surpluses or shortages, are taken directly to the profit and loss account.

Depreciation can also be analysed in terms of the 'normal stock' concept. In periods of rising prices a depreciation charge based on RC can be thought of as part of 'normal stock'. However, there is a deficiency in respect of earlier years

when the provisions were based on a lower RC. This deficiency is known as 'back-log' depreciation: the equivalent in terms of the 'normal stock' concept is the 'loss on speculation'. If provision is made for 'back-log' depreciation, the accumulated depreciation provision at the end of the asset's life will be sufficient to fund the replacement. Such 'back-log' provisions are not necessary where the amount invested in fixed assets each year equals the depreciation charged in the profit and loss account.

2.3 Criticisms of Limperg's Theory⁸

Although Limperg's work has had a major impact on Dutch accounting his work has been criticised by both the academic accountants and practitioners. A survey of some of the criticisms of Limperg's work has been made by Burgert⁹ and much of what follows in this section relies heavily on this survey. Before reviewing these criticisms a methodological point must be established. Since Limperg's theory of value is the basis of his theory of income measurement, if the former is rejected because of its deficiencies, this will automatically imply rejection of the latter. The undermentioned points are not exhaustive of the criticisms as a large Dutch literature exists on this subject: the foregoing is a summary of the main criticisms.

The Theory of Value

1. Only a priori reasons are advanced for Limperg's basic valuation rule that the value of an asset is governed by the lower of:-

- i) RC and NRV, where NRV is $>$ EPV, and
- ii) RC and EPV, where EPV is $>$ NRV

A priorism is hardly a satisfactory theoretical basis for valuation rules. These rules are identical to those developed in the English speaking literature.¹⁰

2. Limperg implies that value is governed by cost only and so ignores the importance of demand factors in determining an asset's value.

3. Burgert has argued that the theory does not take into account the possibility that there may be irreplaceable goods, or goods which are difficult to replace because of the time period which must elapse before a replacement can be made. Further, this category of goods can, in certain circumstances, be used for a variety of purposes, each yielding different marginal utilities. Limperg's theory of value does not help the manager to decide which of these purposes the goods should be used for. It is therefore very difficult to reconcile Limperg's theory with the concept of opportunity cost, which is so important in managerial decision making.

4. Polak,¹¹ a contemporary of Limperg, but a supporter of the Marshallian and Bohm-Bawerk school of economic thought, argued that the value of a commodity was equal to the expected present value of the net proceeds from its disposal. He then showed that only under very restrictive conditions, that is, in a stationery state and equilibrium in perfect markets, was this value equal to the commodity's replacement value. Polak showed that this analysis could also be applied to fixed assets. On the basis of Marshall's

analysis of the short and long run and the possibility of quasi-rents, he was able to conclude that in the case of fixed assets there could be a significant difference between and asset's net present value and its replacement value.

Before reviewing the criticisms of Limperg's theory of income measurement, it is interesting to note the views of van der Schroeff,¹² a prominent present contemporary exponent of Limpergian views, on value theory. He is of the opinion that replacement value theory should not be considered a value theory, but rather a method by which value can be measured. If one takes this view, RVA must then be justified on some other ground, such as, that it provides investors with more relevant information about the company's activities.

Although it stated earlier in this section that if Limperg's theory of values was rejected this also implied that his theory of income measurement should be rejected, van der Schroeff¹³ has taken the view that it is better not to tie Limperg's theory of income measurement to his theory of value. This freeing of income measurement from value theory means that the former can be judged on its own merits and irrespective of the defects of the latter.

The Theory of Income Measurement

1. Limperg thought of these two concepts (that is, the theory of value and the theory of income measurement) in the following terms. The income flow of the business was dependent on output, which in turn was dependent on the capacity of the enterprise. This led him to a working hypothesis of a permanent income source, the basis of which

was a fund of unchanging capital assets. From this he derived the notion that income measures the amount which can be distributed without encroaching on the income source (or fund of capital assets). Burgert¹⁴ has pointed out that Limperg's theory of income measurement is similar to the economic concept of income put forward by Hicks, Fisher, Lindahl and Hansen. These writers consider that maintaining economic capital intact is theoretically feasible as an ex-ante calculation, given perfect foresight and knowledge of all production possibilities, that is past, present and future. These assumptions are unrealistic and so the capital fund will not produce a permanent income flow. In reality there is a continuous growth in knowledge and together with improvements in technology, ensures that over time both capital and income increase.¹⁵ Van Straaten¹⁶ has subjected the Limpergian capital-income theory to a thorough and critical evaluation. He has argued, on grounds similar to those discussed above, that the notion of a permanent capital fund is a physical capital maintenance concept. On the basis of the inherent limitations of this concept and that no criteria can be devised to take account of these limitations, van Straaten rejects the Limpergian approach to income measurement.

2. Are the holding gains attributable to rises in the value of normal stock ever part of income?

Limperg would argue that such gains were not part of distributable income because they could only be distributed by running down the operations of the company. This argument ignores what will happen in the sales market as a

result of the increase in stock values. Subject to any adjustment for the cost of any extra working capital that might be needed the source of income can only be maintained intact if the absolute margin of profit on total production remains the same. This will only happen by chance, but where the absolute margin of profit increases, the holding gains can be regarded as distributable profit, because it is not necessary to maintain the same productive capacity as prior to the increase in stock values. Where the absolute margin declines, as in the case where price controls are rigidly enforced, the source of income can only be maintained if extra productive capacity is installed. Where, therefore, price increases can be attributed to supply and demand factors, Limperg's theory does not handle the resultant holding gains satisfactorily.

In the case where price increases can be attributed solely to monetary factors, Limperg's theory works well. This is because, other things being equal, the price level will rise in proportion to the money supply and so relative prices and profit margins will remain the same. The pitfall of Limperg's theory and all theories based on some form of RV is that they do not distinguish between price changes attributable to monetary factors and those attributable to changes in relative demand and supply, that is specific price increases. In practice, price changes are assumed to be attributable to the former and following Limperg are credited to a non-distributable reserve. This treatment is no doubt satisfactory from a practical viewpoint, but as to whether the underlying assumption is justified or not remains

an unanswered empirical question. Most inflations are caused by a mixture of monetary and real factors. Ideally the accountant would like to identify the amount of price increase attributable to each of these factors. At the present time our current state of knowledge does not enable us to identify these separate amounts and so the treatment of holding gains will continue to occupy an awkward corner in replacement value theory.

Another argument, not unrelated to the previous one, which has been used to defend the treatment of holding gains as part of equity shareholders funds, is that these increases in value have to be financed without the acquisition of new loan capital or equity capital. The difficulty with this argument is that it implies that financing by raising new capital is unacceptable. As we have seen above this may or may not be justified and depends on whether the returns from the increased investment in stocks and or fixed assets will or will not cover the cost of servicing the additional finance raised. Van de Schroeff¹⁷ has extended this argument: he has taken the view that the debt financed portion of the holding gain can be distributed. These arguments are very similar to those voiced after the publication of the Sandilands Report¹⁸ and referred to in Chapter 1.

3. Are declines in value attributable to holding normal stocks always a loss?

Whilst this valuation rule is closely tied to the accountants principle of conservatism, it can only be justified if it can be shown that the replacement of capital equal to the decrease in value of assets is an inevitable condition for

maintaining the source of income intact.¹⁹ Clearly this is not the case, since whether a firm's source of income is maintained depends on what happens to output prices and not on what accounting entries have been made. The above proposition can only be accepted if the aim of the theory is extended to include maintaining nominal capital. In this case it should be realised that the theory only maintains the amount of capital historically invested in the company and not the actual nominal capital, which would only be maintained if every decrease in value was charged directly to the profit and loss account, instead of as now, the revaluation reserves until the balance on this account is exhausted.

4. The Double Minimum Postulate

As we shall see, this point is really an extension of (3) above. The charging of holding losses to revaluation reserve until no balance remains on this account and then to the profit and loss account is referred to in the Dutch literature as the postulate of the 'double minimum'. If the combined balances of the retained earnings and current income account are insufficient to absorb the loss, future income must not be recognised until the original investment is restored. This weakness has not been overlooked by Limperg's critics, such as, van Straatan, van Muiswinkel, Kleerekoper and May in his earlier writing. They have pointed out that this double standard is hardly consistent with Limperg's emphasis on current values which he so forcefully expresses in his cost and value theory. The only justification offered by Limperg is that the loss

shareholders incur when a holding loss is sustained is just as real as a loss from unprofitable operations. For example, in liquidation, the economic position of the shareholder is the same, regardless of the cause of the value decrease. However, the norm of the historical investment was never offered as a unitary criterion and elsewhere in Limperg's work he provides very little justification for its use in this context. Why this maintenance base should be substituted for his original maintenance concept remains an unanswered question.

5. The replacement of assets in a dynamic economy

Because of changes in technology and consumer tastes, assets retired in the normal course of business will only by chance be replaced by identical assets. This means that it is often difficult, if not impossible, to calculate objectively the RV of existing assets. To date, the theory and its supporters have not offered a totally satisfactory solution to this problem. Burgert²⁰ has suggested a way of calculating this value, but it is extremely subjective and leads him to the conclusion that it would not be possible to calculate income without ambiguity and with certitude. It should be pointed out that whilst supporters of RVA agree that valuation problems can arise in the case of non-identical replacement, they argue that a theory which aims at an objective ex-post income calculation should restrict itself to the valuation of assets which the company already possesses. Once this argument is admitted it becomes very doubtful whether maintenance of the source of income will be realised in other than static conditions;

the problem of valuing assets which will no longer be replaced remains and in effect the problem is solved by ignoring it. Hardly a satisfactory solution!

6. The problem of determining normal stock level

This concept has been difficult to apply in practice. Management has been unable to control the volume of real stock effectively. This has meant that amounts have been taken to the profit and loss account, in respect of speculative gains or losses, which do not represent genuine speculation. The notion of normal stock has therefore had to be modified to take this factor into account. In most systems of RVA normal stocks are allowed to fluctuate without giving rise to an adjustment in respect of speculation. Whilst this modification is no doubt a satisfactory expedient, it should be remembered that the purpose of this adjustment was not to find an acceptable level of normal stock, but to ascertain what further adjustment needs to be made to maintain the source of income intact. This question can only be answered by reference to the future and a management decision comparable to that needed in the case of the non-identical replacement. These two factors considerably reduce the objectivity of the income calculation.

A further problem which has arisen in practice is how the gains which have been accumulated from previous increases in value should be treated when the level of normal stock is permanently reduced. Some authorities have asserted that once these gains have been taken to the revaluation account, unless there are holding losses, these must be retained in the revaluation account and not taken to the

profit and loss account. No reason is put forward for this treatment but it seems purely a matter of opinion which treatment is favoured. Whilst this is a relatively minor point, it does highlight another area in the application of Limperg's theory which has, as yet, not been fully worked out.

7. The theory concerns itself only with the treatment of non-monetary assets.

Price level changes also affect monetary assets and it is difficult to see how the source of income can be maintained intact if it ignores such assets. In practice, replacement value theory has been extended to take this factor into consideration: the Philips Group make an adjustment by reference to the amount of equity invested in monetary assets. This is found by comparing total monetary assets with total liabilities and if the former is in excess of the latter, the difference is considered to be the amount of equity capital invested in monetary assets. An index reflecting changes in the purchasing power of money is then applied to this difference and the resulting amount is charged to the profit and loss account.

8. The inherent subjectivity of Limperg's theory

In an earlier footnote it was stated that one of the main critics of Limperg's views has been Pruijt²¹ whose views are of particular interest because they emphasise not only the ambiguity in Limperg's theory but also its subjectivity. The main points of Pruijt's critique can be summarised as follows:-

1. The RV of technically identical stocks is only objective when these stocks are traded in a perfectly competitive market.
2. In the case of non-identical replacement of stocks, the profit calculation will be influenced by the subjective choice of management concerning stock replacement.
3. Non-identical replacement of fixed assets. Two subjective elements are introduced, the choice of replacing the fixed assets and the replacement price.
4. Limperg's view that increases in the value of productive capacity are tied up in the equity interest is only acceptable when the starting point is the subjectively chosen management decision concerning the method of finance. That is, the continuity of the company is to be financed without further recourse to the capital market.

This section would not be complete without briefly evaluating Limperg's contribution to the problem of accounting during a period of changing prices. Limperg's work clearly represents a major contribution. It should not be forgotten that Limperg would not have had access to all the related literature because translation facilities were not as readily available then as they are now and because academic contact was far more restricted. Whilst Limperg's theoretical framework has been shown to be deficient in a number of respects, the information contained in published replacement value accounts has been of considerable use to both investors

and management. As was stated earlier Limperg's influence in Dutch accounting education and practice has been and still is immense. Such an influence is indicative of the major contribution he has made to accounting. It is to be regretted that so little is known about Dutch accounting thought. Had the English speaking accountants been aware of the earlier debates in Holland, our literature would have been greatly enriched and one suspects, much smaller!

Before turning to the post-war contributions to the Dutch literature some mention must be made of Burgert, Limperg's adversary. As the critique above has shown Burgert has rigorously analysed Limperg's theory and exposed its deficiencies and limitations. I have had the privilege of talking to Burgert for three hours on various aspects of RVA and found him to be the most impressive academic accountant I have ever met. It is to be regretted that most of his papers have only been published in Dutch. Although his influence has not been as great as Limperg's in both academic and practical spheres, there are definite signs that his views are gaining acceptance in preference to Limperg's.

3. POST-WAR CONTRIBUTIONS TO ACCOUNTING THOUGHT IN THE NETHERLANDS.

Obviously it is not possible to survey all the literature that has been published on this subject and so only the major contributions will be reviewed. A striking feature of the contributions is the absence of any support for a comprehensive system of current purchasing power accounting, although there has been considerable support for a combination of RVA and current purchasing power accounting.

An early post-war contribution along these lines was made by Bakker²² whose suggested adjustments were intended to maintain the purchasing power of the equity capital. The necessary adjustment for the loss of purchasing power of the firm's equity capital was to be charged to the profit and loss account. He considered this adjustment to be the difference between the amount necessary to adjust for the loss of purchasing power of the equity capital, calculated on the basis of a cost of living index and the increase in the value of the non-monetary assets during the accounting period. In effect the assets side of the balance sheet is the same as the Limperg system. The difference between the two systems is on the liabilities side. Whereas in Limperg's system the increase in the value of the non-monetary assets is treated as part of the equity, in Bakker's system this increase is used to maintain the purchasing power of the equity interest at the beginning of the year. Where the increase in value of the non-monetary assets is less than the decline in purchasing power of the equity, the shortfall is charged to the profit and loss account. In the converse case the surplus is taken to the profit and loss account and regarded as distributable.

One of the most influential and consistent supporters of RVA has been Goudekot. He is largely responsible for the introduction of RVA in both the external and internal accounts of the Philips group. His publications on the practical application of RVA have become accounting classics in both Holland and the English speaking world. In an early paper²³ given to the Sixth International Accounting Congress in 1952

he emphasised the importance of RVA information to management in a period of inflation. A subsequent paper²⁴ explained in detail the application of RVA in the Philips group. Groeneveld²⁵ who in another congress paper argued that the application of RVA enabled profit to be computed with a degree of certainty not inherent in the alternative accounting systems which have been suggested. To a large extent both writers have adopted Limperg's views, although in practical application (ie within the Philips Group) some modification has been found to be necessary.

A subsequent paper which argued in similar vein to Goudekot and Groeneveld was presented to the Eighth International Accountants Congress in 1962 by Kleerekoper²⁶. Although his paper largely reiterates Limperg's views he lists three postulates which have been followed by companies who have adopted some form of RVA. These three postulates are stated below:-

1. A transaction profit is the difference between the net proceeds from goods or services rendered and the current replacement value of the goods or services sold or rendered.
2. Differences between the replacement value of non-monetary assets and historic cost are 'value differences' and do not form part of transaction profit.
3. The positive differences set aside in accordance with 2. are a capital surplus: where negative differences arise these are debited against the accumulated surplus until this account is exhausted:

subsequent negative differences are then charged to the profit and loss account.

This support reinforces the earlier conclusion that Limperg's ideas have gained acceptance in both business and academic circles. Goudeket's paper is especially instructive as it shows:-

1. That Limperg's theory could be implemented in practice.
2. How Philips have modified its application in order to take account of the weaknesses in his theory.

In contrast to these contributions Graafstal²⁷ developed a profit concept based on maintaining the purchasing power of the company's equity. He justifies this concept on the grounds that the two most important requirements of a concept of profit are practicability and neutrality. By the latter he means the absence of a specific aim or aims to be achieved by the concept. This approach avoids the problems of selecting specific aims and enables a profit concept to be developed independently of maintaining any particular asset or capital base. In his view profit should indicate what can be distributed to shareholders and the standard to be used in determining this amount should be the real net worth of the company at the start of the period. This concept is clearly practicable and is a variant of RVA. Graafstal's ideas are similar to those of Bakker. The difference between them is in their approach to capital maintenance. Bakker's profit concept can be thought of as a residual figure which remains after maintaining the purchasing power of the equity interest. Graafstal develops his profit concept almost independently of a capital maintenance base: in this sense the capital maintenance

concept is a residual figure that remains after the profit for the year has been computed.

No discussion of the post-war contributions would be complete without referring to the contribution of van Bruinessen. As stated in the introduction this person is a very busy practitioner; he is also a very enthusiastic supporter of Limperg's views. In a recent paper ²⁸ he focusses primarily on the calculation of income and does not tie it to any particular theory of value or a capital maintenance base.

He argues that the main advantage of current value accounting is the improved quality of the information it generates. Note that van Bruinessen uses the term current value and not replacement value: the reason being that the latter term has been taken to be the price of technically identical assets. Instead of charging the relevant portion of the latter against profit, van Bruinessen would charge the relevant portion of an asset of identical significance. This, he argues, overcomes the effects of technology on replacement. Van Bruinessen ²⁹ argues:

'It is not the durable asset, as such, but the used-up and remaining units of productive capacity that respectively determine the depreciation charges and the book-value. In this connection 'unit of productive capacity' means the productive capacity surrendered in the course of one year of the asset's lifetime. Technological developments are recognised by establishing the price of modern equipment making similar products and by computing the value per unit of productive capacity of the existing asset as follows:-

Depreciation charge per unit of the modern asset	a
Complementary exploitation costs per such unit	b
<u>Deduct</u> Complementary exploitation costs per unit of the existing asset	(c)
Value per unit of productive capacity of the existing asset	<u>Balance</u>

This balance represents, for the year concerned, the depreciation charge attributable to the existing asset and, when multiplied by the number of its remaining units of productive capacity, its current value. If due to technological or economic developments the asset's current value is lower than its opening book value less the depreciation for the year as calculated above, the difference should be charged to the result for the period.'

As van Bruinessen supports Limperg's views it is not surprising that his views have been fiercely challenged by Burgert.³⁰ It is to his views that I now turn. Burgert's main contribution to the development of current value theory can be found in a paper prepared for the Dutch Accountants Day in 1967 (see reference 30 (3) page 23). He argues that a very desirable quality of any profit figure is that it should be 'neutral'. By this he means that it should not be influenced by the subjective objectives of management. The profit figure, together with the annual accounts (including the director's report in the case of 2. and 3. below) should fulfil three functions: these are:-

1. To provide information about the income available for distribution amongst the various interested parties eg shareholders, employees and directors.
2. To render an account of managerial performance.

3. To enable the capital market to allocate scarce investment to the most efficient companies.

He then points out that the measurement of profit is dependent on which particular capital maintenance concept is chosen and distinguishes five which have been reported on extensively in the literature.

1. Maintenance of the nominal capital
2. Maintenance of inventories, a concept which he has supported in his writings (see references 30 (2) and 30 (4))
3. Maintenance of non-monetary assets
4. Maintenance, in purchasing power terms, of the shareholders' equity.
5. Maintenance of the company's source of income.

Given this multiplicity of objectives, he argues that economists should not try to agree on one particular capital maintenance concept but should recognise that there are 'different concepts of profit for different purposes'. This leads him to the conclusion that management should be able to choose which particular concept to adopt but that the choice should be explained in the notes forming part of the annual accounts.

In support of this he refers to the profit concept advanced by Edwards and Bell.³¹ These are not concerned with capital maintenance or distributable income but focus on the sources from which an increase in equity can arise. Burgert argues that this approach would satisfy functions 2. and 3. above. In a supplementary statement, or in a different section of the profit and loss account, information relating to the first function (distributable income) could be provided and in

particular, which part of the increase in stock and fixed asset values management considers distributable. Whilst Burgert recognises that theories which maintain a particular capital maintenance base and those which (following Edwards and Bell ³²) aim at presenting shareholders with relevant information have merits, he tries to construct a profit and loss account and balance sheet which satisfies the three functions of accounts and the two groups of theories referred to above. In his scheme of financial reporting the non-monetary assets would be stated in the balance sheet at their current value and the structure of the profit and loss account would be as shown below.

1.	Sales	xxx
2.	<u>Deduct</u> Cost of goods, based on current cost	<u>xxx</u>
	Operating profit	xxx
3.	<u>Add</u> Realisable gains on non-monetary assets	<u>xxx</u>
	Increase in net equity	xxx
4.	<u>Deduct</u> Undistributable part of the increase in net equity according to the maintenance concept chosen by the company's management	<u>xxx</u>
		xxx
5.	<u>Deduct</u> Taxes on profit	<u>xxx</u>
	Distributable income	xxx
6.	<u>Deduct</u> Proposed retained profit	<u>xxx</u>
	Proposed distribution	xxx
		<u>=====</u>

Having reviewed Burgert's contribution we are now in a position to summarise current professional and academic thinking on accounting for price level changes. Undoubtedly the most favoured accounting system is current value accounting

which has the advantage of separating operating profit and holding gains and as such improves the quality of information received by the various interested parties. It also has the advantage of not being tied to a specific profit concept unlike the alternative current value systems suggested by Limperg, Goudeket, Groeneveld and Kleerekoper. What is striking about the Dutch contributions is their total lack of support for a comprehensive current purchasing power accounting, a system which has been favoured by the professional bodies in the US (including FASB) and the UK. Having said this there is support for the idea that current value accounting is appropriate for non-monetary assets and that the relevant capital maintenance concept should be the purchasing power of the shareholders' interest.

Having reviewed the theoretical contributions to Dutch accounting thought we now turn to the post-war influences on financial reporting in the Netherlands and in particular why the larger firms have abandoned historic cost accounting in favour of some form of replacement value accounting.

4. POST-WAR ECONOMIC AND INSTITUTIONAL INFLUENCES ON FINANCIAL REPORTING PRACTICES

This section is based on discussions I have had with various academic and professional accountants ³³ in Holland. It will be divided into two parts: Part 4.1 will discuss the economic influences: part 4.2 will discuss the institutional influences. Obviously there will be some overlap between the two parts. The writer felt that by taking this approach he would be able to focus more clearly on

the various factors which have influenced financial reporting practices. The final paragraph will consider briefly the impact of taxation on financial reporting practices.

4.1 The major influences since 1945 have been:-

- i) Technological developments, such as larger plant sizes etc, these have necessitated raising larger sums than could be obtained from the traditional sources, such as retained profits and owners' savings;
- ii) the loss of Indonesia; a traditional market for the goods produced by Dutch industry: this meant that new markets had to be found for these products;
- iii) the formation of the Common Market which meant increased competition from France and Germany.

These factors have led to:-

- a) the absorption of smaller business units by larger ones (often referred to in the literature as the modern corporation) and by implication the demise of the family controlled company;
- b) the need for a more highly developed stock market where large sums of money could be raised to finance the increased capital expenditure requirements referred to above.

The hallmark of the modern corporation is the segregation of those who have subscribed funds to the business (shareholders) from those who manage the funds entrusted to them (managers). To ensure that these funds are properly accounted for, shareholders and other interested parties need some form of report on how management has used the funds entrusted to them. Traditionally this obligation has been satisfied by the preparation of annual accounts for the approval of shareholders

and for comment by other interested parties such as the financial press and investment analysts. In the Netherlands, the function of annual accounts and other similar statements is usually described as the provision of retrospective external information to enable a proper judgement of management stewardship. The information contained in the annual accounts has not been restricted to ensuring that management has not defrauded the shareholders but has taken a wider and possibly more important role, that of providing the means by which economic resources are allocated to the most efficient firms.

Another major influence on financial reporting has been that a number of directors have recognised that there is no real difference between the duty of directors to report publicly on the outcome of their stewardship and the duty of divisional management to report on the outcome of their stewardship to the Board of Directors. Both forms of information are meant to enable an opinion to be formed on their stewardship in order to facilitate an efficient allocation of resources, whether amongst firms or within firms. It has been found that the information provided by RVA is of more use to shareholders and management in assessing efficiency than traditional historic cost accounts.

Running parallel to these developments has been the increased attention which has been paid to the corporate sector by the government, businessmen and the trade unions. This interest has centred around the importance of this sector as:

- i) a source of income for employees;
- ii) an indicator of national economic performance.

The growth of the modern corporation and the increased

attention paid to the various interested parties has also occurred in the English speaking countries. The parallel runs further in that these developments have taken place at the same time. As we shall see the difference lies in the response. Whilst no major corporation in the English speaking countries has adopted RVA a number of such corporations in the Netherlands have adopted some form of RVA. The reasons for this will be discussed in the next chapter. The next part of this section will examine the institutional factors which have affected reporting practices.

4.2 Institutional factors.

Prior to the 1970 Act on Annual Accounts there was considerable diversity in the form, presentation and quality of published accounts. The first major post-war development was the appointment by the Dutch Employers' Organisation of a committee to examine, amongst other things, the form and content of annual financial statements. In 1955 a report was issued - 'The Annual Report'. The problems of valuation were discussed and the report boldly stated depreciation on the basis of RV was necessary for the correct determination of periodic profit or loss. The danger of not applying the principles of RVA to fixed assets was also highlighted in the report. Whilst the directives of the committee's report were in no way binding they had a marked effect on accounting practices. This can be attributed to the status of the committee's members and because they were an aggregate expression of actual business opinion.

A second more detailed report 'Reporting, rendering of account and the provision of information by directors of limited liability companies' was published by the same committee in 1962. This report starts from the premise that annual financial statements should reflect the outcome of management's stewardship and that the profit and loss account should reflect the size and nature of the profit achieved by the firm and that the balance sheet should show the financial position at the end of the accounting period. The committee stressed the importance of correctly valuing assets and liabilities and that the reported profit should be in accordance with sound business economic principles. In most cases this implied using RV as the valuation base, as the committee were of the opinion that it was only when RV was used could an adequate insight into the profit and loss account and balance sheet be provided. The committee also stated that where replacement values were not used and the differences were material, it deemed it desirable that the explanatory notes should include details of depreciation computed on the basis of replacement value, the effect of changes in the price of stocks and raw materials and the replacement value of assets held by the business at the end of the accounting period. Dutch accountants have regarded this report as a milestone and the report of this committee has had a major impact on the financial reporting practices followed by both quoted and unquoted companies. Over the same period, 1945-1970, the employees federation, the organisation of Dutch employees, was more interested in reforming company legislation in a wider context. As such, the provision of obligatory information was only a

part and the aim of the council was to secure employees representatives a place on the board of directors and also to set up employees councils. They were not particularly concerned about a revision of accounting principles.

This increased activity as regards the provision of obligatory financial information was not confined to the employers and employees organisations and two years prior to the publication of the employers organisation's second report, the Minister of Justice had set up a committee to investigate whether the law as it then related to companies was in need of revision. The committee was also asked to pay special attention to financial disclosure in published accounts. In Chapter 4 of this report, which was published in 1964, there was a draft bill on the disclosure requirements of annual accounts. This bill was very well received by the three main groups affected; the employers, employees and the accounting profession. After some minor amendments the Dutch Parliament passed the act in 1970. The NIVRA translation into English of Sections 2 to 5 inclusive, which deal with disclosure, and an excerpt from the Explanatory Comments are reproduced in an Appendix to this chapter.

The informal consultations between the three interested parties which had taken place after the publication of the above report was put on a more formal basis in 1971 when the Minister of Economic Affairs invited employers' organisations, trade unionists and accountants to set up a joint study group to define accounting standards which were 'acceptable in economic and social life'. Each of these bodies has the equivalent of an 'Accounting Principles Board' and delegates

from each of these boards form what is known as the 'Tripartite Committee'. The following procedure has been adopted for its activities. On each subject one of the three 'Accounting Principles Boards' prepares a draft for discussion by the full committee. To date the board nominated by NIVRA has prepared the initial draft. Nearly always there are a large number of amendments. After the amended draft has been passed an Exposure Draft is issued under the title of 'Considerations on the Act on Annual Accounts of Enterprises'. Interested parties can then inform the Tripartite Committee of their comments and after further consideration the amended draft is passed and issued as a Statement of the Committee. An extract of the first statement and of exposure drafts one, two and three are reproduced in the appendix to this chapter. Subsequently exposure drafts two and three have been issued as Statements of the Committee. These extracts clearly demonstrate that the Tripartite Committee strongly favours current value accounting. Whilst it is still acceptable to state cost of goods sold and stock at historic cost, if there are material variations between this figure and their current value, the notes must indicate the magnitude of the difference. A corresponding obligation also exists in relation to fixed assets but the Tripartite Committee holds the view that either the profit and loss account, or the notes, must provide information about operating income and net equity on both cases. Current institutional opinion on replacement value accounting (or current value accounting if this term is preferred) is clearly very favourable. It remains to be seen whether these proposals are implemented in practice.

A note on the influence of taxation

Since the above paragraphs have been concerned with the development of sound accounting practices, this discussion would not be complete without a few lines on the influence or otherwise of tax legislation on financial reporting practices. In the Netherlands there is almost a complete dividing line between 'business economic' annual accounts and accounts prepared for tax purposes. It is only in a small number of cases that the 'business economic accounts' and the fiscal accounts are identical, that is, smaller companies where the ownership and management are the same. Dutch accountants are adamant that tax legislation should not become the determinant of accounting practices. It is felt that accounting should foster its own cause by taking full account of all the relevant events and the best theoretical developments. The accountants feel that only by pursuing this policy will tax legislation follow generally accepted accounting practices. ³⁴

5. RVA AND THE REQUIREMENTS OF SOUND ACCOUNTING PRACTICES

A soundly based accounting practice must satisfy two conditions:

1. The valuation base adopted should facilitate a realistic appraisal of the company's performance and how well it has performed as compared to other companies.
2. Objective, in the sense that the practices are not influenced by the subjective intentions of management.

The question then becomes whether RVA satisfies these two

requirements and so enables the various diverse groups referred to above to appraise satisfactorily a company's performance. This question is important because in many countries very considerable doubts have been expressed as to whether RVA satisfies these two requirements: as a result RVA is not widely accepted outside the Netherlands. Before examining this question it is necessary to clear up a misunderstanding that has arisen outside the Netherlands about what is meant by the term RV. It is not the price to be paid when existing fixed assets are replaced, but to meet the requirement of objectivity, a value based on actual data and facts which are ascertainable at the moment when the valuation is made. That is, the amount involved if the asset were acquired at the date of the balance sheet. As we have said earlier, because of the confusion that has arisen about the term 'replacement value', some authors³⁶ have suggested that a more appropriate term to describe this accounting system might be current value accounting.

The following discussion about the appropriateness and objectivity of RVA starts from the premise that financial statements should show a true and fair view of management's stewardship and in particular, of the net equity and results of the entity. This can only be shown if it is known what data has determined management's policy. In nearly all countries the historical cost convention is the prevailing one for external reporting but does this imply that the convention is also used by management in decision making and financial planning? Based on observation and experience as a practising accountant, van Bruinessen emphatically says no.

It has been noticeable that in the post-war period there has been increasing doubt as to the relevance and appropriateness of financial accounts based on cost. The use of acquisition cost in periods of inflation results in amounts of a dissimilar nature being added together and, given the need for comparable information, a yardstick must be used which is indifferent to the data that is to be measured or compared. A yardstick based on current values meets this requirement because it eliminates changes in value that have occurred as a result of the passage of time. This enables items in the profit and loss account and balance sheet to be stated on the same basis and without the distorting influence of time referred to in the previous sentence, because all the valuations are based on the same data. As a result users can appraise the performance of a company more realistically and so decisions based on this data are likely to be more informed.

Decision making within companies can be broken down into two categories, short-term and long-term. Examples of the former are the buying of raw materials and selling of products; of the latter the acquisition of fixed assets. These decisions are governed by current facts and data and in the case of day-to-day managerial decisions these will be based on quotations obtained from the various markets. Current data and facts will also be the basis of forecasts prepared in support of decisions on long-term investments. Earlier in this section it was stated that the aims of both internal and external reporting were the same. On this basis the assertion that 'what is good for the company's management is good for the shareholders and other interested parties', seems justified. Thus, financial statements, whether prepared for

internal or external purposes, should be based on current values. It follows that if current values are used in internal reports and historic costs in external reporting, resource misallocation may occur. This might arise because the historic cost figures indicate one course of action and the current value accounts another and if the former is used in decision making resources will be misallocated. In the economy as a whole this misallocation could be substantial. Indeed, certain commentators in Holland are of the view that the distortion of resources caused by retaining historic cost accounts greatly endangers the economy of the western world.

Having discussed the acceptability of RVA, the second requirement of a sound accounting practice will now be considered, objectivity. A frequently cited objection to RVA, especially from practising accountants in the English world, is that current values are too subjective and that the auditor is at the mercy of management. Whilst this criticism is to some extent warranted, van Bruinessen makes three points in connection with the objectivity requirement.

1. The use of estimates is an element of most accounting systems, an obvious example is the estimated life of a fixed asset.

2. It is not the price of a future replacement which is being estimated. This value could only be a subjective estimate as neither management nor the public accountant are gifted with perfect foresight. Current values are the actual prices that would have to be paid if the productive capacity used during the year was replaced. In the case of stock, since replacement takes place frequently it is

not difficult to establish current values. This is also true of the current cost of productive capacity which has been retired or replaced during the course of the year. Prices paid for the replacement of retired fixed assets, after making any necessary adjustments in respect of capacity and complimentary costs, provide reliable indications about the current values of fixed assets that are still being used at the year end.

3. A real difficulty does arise in cases where the current value of plant or equipment is greatly influenced by rapid technological development.³⁷ This problem is particularly acute in the electronics and petrochemical industries. In such situations the highest professional skill of accountants and auditors is required. It is frequently asserted, though wrongly, that the current value of fixed assets could be found by applying a number of specific indices to the HC of the asset under consideration. For instance, in the case of a six year old blast furnace, the current replacement cost could be found by applying specific indices to the constituents of the blast furnace. The adjusted historic cost of an existing fixed asset is not equivalent to its current value. Not only will newly developed methods and materials be used in constructing the asset, but also the new asset is likely to result in one or other of the following, better products at the same cost, identical products at lower cost, or even better products at a lower cost. If the rate of technological development is very rapid the application of specific indices to the cost components will lead to an appreciable variation in the

profit and net equity figure, as compared to the situation where the actual cost of a new blast furnace is reported in the financial statements.³⁸ The precise calculations involved have already been discussed and the purpose of this discussion was merely to state the problem and how it relates to the objectivity requirement.

In this section of the chapter we have shown why replacement value accounting has been accepted as a sound accounting practice. However, it should not be assumed from this statement that replacement value accounting is universally adopted in the Netherlands. As we shall see in the next chapter this is far from being the case.

6. CONCLUSIONS

From this survey the following points emerge:-

1. Limperg's theory of RVA has been shown to be deficient in a number of respects.
2. A number of academic and professional accountants have embraced his theory, albeit with reservations.
3. There is no support for CPP accounting but some support for adjusting the shareholders' equity for changes in the purchasing power of the guilder.
4. There is support from both business and employee organisations for RVA.
5. Tax practices have had little or no influence on the debate: indeed if the Hofstun Report is implemented the reverse will be true.
6. RVA is acceptable to Dutch professional accountants as a sound accounting practice.

7. In its practical implementation RVA has been modified and its application is now very similar to the current cost principles set out in ED18 and ED24.

8. This modified form of RVA is known as Current Value Accounting.

R E F E R E N C E S

1. LIMPERG'S ideas and tradition have become so firmly embedded in this Institution that it is referred to as the Amsterdam School. In recent years another influential school of thought has emerged led by Professor R. Burgert and is referred to as the Rotterdam School.
2. In Dutch the term bedrijfseconomie is not really synonymous with business economics. Bedrijfseconomie is a specialisation of general economics and covers a wide field as can be seen from the following list;
 1. Organisation theory - internal and external
 2. Cost and management accounting
 3. Income determination
 4. Finance
 5. Special topics such as marketing, insurance and project appraisals, etc.
3. LIMPERG Th Bedrijfseconomie Parts I-VII
Deventer, A E Kluwer (1964)
4. LIMPERG Th De gevolgen van de devaluatie van de gulden voor de berekening van Waarde en winst in het bedrijf
MAB (January 1937) p 2
5. For a more detailed discussion of this concept see
VON SEVENTER A The continuity postulate in the Dutch theory of business income
THE INTERNATIONAL JOURNAL OF ACCOUNTING EDUCATION AND RESEARCH Volume 4 No 2 (Spring 1969)
6. Private communication
7. LIMPERG Th Bedrijfseconomie Part I
Deventer, A E Kluwer (1964) p 209
8. 'Defenders' of replacement value theory have been:
G Diephuis, H H M Foppe, A B Frielink, A Goudekot
G J Groeneveld, A Th de Lange, Th Limperg
H J van der Schroeff, A F Tempelaar

'Challengers' have been:: O Bakker, J C Brezet,
R Burgert, M J H Cobbenhagen, B van Deventer,
J L Mey, F L van Muiswinkel, B Pruijt,
H van Ravestijn and H C van Straaten
9. BURGERT R Bedrijfseconomisch aanvaardbare grondslagen voor de gepubliceerde jaarrekening
Preadvies uitgebracht voor de Accountantsdag (1967)
Bijlage bij De Accountant No 4 NIVRA (September 1967)
10. SOLOMONS D Economic and accounting concepts of cost and value in BACKER (Ed) Modern Accounting theory
PRENTICE-HALL (1966)

11. POLAK N J Waarderings - en balansproblemen (Problems of valuation and balancing)
VERSPREIDE GESCHRIFTEN (1924) p 206
12. VAN DER SCHROEFF H J Schoonheidsgebreken in de theorie van de vervangingswaarde (Disfiguring deficiencies in the theory of replacement value)
PERMEREND J MUUSSES (1964) pp. 6-7
13. VAN DER SCHROEFF H J Kosten en Kostprijs (cost and cost price)
7th printing 1970 p 16
14. BURGERT ibid.
15. DEWEY D Modern Capital Theory
COLUMBIA UNIVERSITY (1965) pp. 28-30
16. VAN STRAATEN H C Inhoud en grenzen van het winstbegrip
H E STENFERT KROESE NV, Leiden Netherlands (1957)
pp. 32-65
17. VAN DER SCHROEFF H J Schoonheidsgebreken in de theorie van de vervangingswaarde (A reply to Dr. F L van Muiswinkel)
MAANDBLAD VOOR ACCOUNTANCY EN BEDRIJFSHOUDKUNDE 38
No 5 (May 1964) p 179
18. REPORT OF THE INFLATION ACCOUNTING COMMITTEE
Chairman F E P Sandilands
Cmnd 6225 (September 1975)
19. This point has also been made by van der Schroof, ibid. p 179 and comments in the same direction have been made by J L Mey Moeilijkheden met de vervangingswaardetheorie, a reprint in 1924,
MAB (1960) J MUUSSES, Purmerend, Netherlands (1960)
p 439
20. BRUGERT R ibid, see especially p 120. Klassen, a lecturer at the Free University of Amsterdam has shown this writer a worked example of Burgert's suggestions: he shares the same views as Burgert about its deficiencies and practicability.
21. PRUIJT B Subjectieve schattingen en beleidselementen bij winstbepalingen en winstbestemming (Subjective estimates and management data on the problem of profit determination and profit
BOHN NV, Haarlem de Erven F (1964)
22. BAKKER O Bedrijfshuishoudkunde (Business economics)
Part III (1947) pp. 192
23. GOUDEKET A How inflation is being recognised in Financial Statements in the Netherlands
JA (October 1952)

24. GOUDEKET A An application of replacement value theory
JA (July 1960)
25. GROENEVELD G L Ascertainment of profit in business
Paper for the Seventh International Congress of
Accountants in Amsterdam (1957)
26. KLEEREKOPER I The economic approach to accounting
Paper for the Eighth International Accounting
Congress, New York (1962)
27. GRAAFSTAL F Harmonisation of Accounting Principles
and the concept of profit
Paper for the Ninth International Accounting Congress
in Paris (1967)
28. VAN BRUINESSEN W Bases of accounting other than
historical cost
Paper for the Tenth International Accounting Congress
in Sydney (1972)
29. *ibid.* at p 10
30. His major publications are as follows:
BURGERT R
 1. Enige beschouwingen over de wenselijkheid van
bedrijfseconomische clausulering van de accountants
Leiden, H E Stenfert Kroese NV (1956)
 2. De behandeling van vlottende en vast kapitaal-
goederen bij de winstbepaling
Leiden, H E Stenfert Kroese NV (1963)
 3. Bedrijfseconomisch aanvaardbare grondslagen voor
de gepubliceerde jaarrekening. Praedvies ult-
gebracht voor de Accountants dag 1967, Bijlagegij
de Accountant, No 4
Nederlands Instituut van Register-Accountants
(September 1967)
 4. Enkelebeschouwingen over kosteninformatie ten
behoefte van het bedrijfsbeleid
Haarlem De Erven F Bohn NV (1967)
31. EDWARDS E O & BELL P W The theory of measurement
and business income
UNIVERSITY OF CALIFORNIA PRESS, Berkeley (1961)
32. *ibid.*
33. In this connection I owe an especial debt to van
Bruinessen.
34. Evidence of this policy having effect was the publica-
tion of the Government sponsored 'Hofstra Report'.
This recommended that for tax purposes, RVA with a
gearing adjustment should be adopted. Implementation
of the Report's proposals is expected in the future
though not without controversy.

35. This section is also based on discussions and material supplied by van Bruinessen. I have checked this section with a number of accountants in Holland and they are in agreement that it is representative of Dutch accounting thought.
36. VAN BRUINESSEN *ibid.* Bases of accounting other than historical cost
37. This section elaborates on the views expressed by van Bruinessen in his Sydney paper - see the earlier section dealing with Post-War contributions to Dutch accounting thought.
38. For the precise calculations involved in this situation see van Bruinessen's example in the section dealing with Post-War contributions to Dutch accounting thought.

APPENDIX I

Extract from the Netherlands Act on Annual Accounts together with explanations derived from the documents relating to the parliamentary discussions of the Bill. The - unofficial - translation of Bill and documents was published by the N.I.v.R.A. (Netherlands Institute of Registered Accountants) and was prepared by the Institute's Member, Drs. J. de Jong and revised by Mr. P.N. Mc. Monnies, Assistant Secretary (Research) of the Institute of Chartered Accountants of Scotland.

The Act comprises not more than 42 sections, divided into six chapters:

- I. General provisions (sections 1/8)
- II. Further provisions concerning the balance sheet and explanatory notes (sections 9/26)
- III. Further provisions concerning the profit and loss account and explanatory notes (sections 27/30)
- IV. Administration of justice concerning annual accounts (sections 31/35)
- V. Provisions concerning enterprises of differing types (sections 36/38)
- VI. Final provisions (sections 39/42).

For the accounting debate in four countries, the sections of chapter I are of major importance.

Section I gives definitions of both the concept "enterprise" (public and private limited liability company, co-operative society, mutual insurance company) and the concept "annual accounts" (balance sheet, profit and loss account and the

explanatory notes, appended to these statements).

The Act does not deal with the report of the managing directors. A need for a statutory regulation of this report is not recognised and it would be difficult, as the Netherlands Minister of Justice explains "to give detailed statutory regulations for this. For instance, one cannot require the report always to contain exact information on, say, the enterprise's future, particularly if, as is desirable, the report and annual accounts are submitted shortly after the end of the financial year". (Unquote).

Section 2: The annual accounts provide such information that a sound judgement can be formed on the financial position and result of the enterprise and, to the extent to which annual accounts permit, on its solvency and liquidity.

Section 3,1: The balance sheet, together with the explanatory notes, reflects fairly and systematically the size and composition of the enterprise's capital at the end of the financial year.

3,2: The profit and loss account, together with the explanatory notes, reflects fairly and systematically the size and composition of the enterprise's result for the financial year.

Section 4: The combining, analysing and classifying of the data in the annual accounts are aimed at giving the information that, by virtue of section 2, is to be provided by

the annual accounts. In doing so, the provisions of the chapters II and III are adhered to in all cases, unless this would result in showing separately items which are immaterial in the context of the annual accounts.

The corresponding figures for the previous year are included in the annual accounts.

Section 5,1: The bases, underlying the valuation of the assets and liabilities and the determination of the result comply with standards, that are regarded as being acceptable in economic and social life.

5,2: The explanatory notes give an exposition of these bases.

5,3: If an alteration of these bases is of essential significance, such alteration is explicitly stated, showing its effects on the net equity and the result.

Section 6: To the extent to which it is required for ensuring a fair picture of the composition of the enterprise's financial position and result, reserves and movements therein are separately stated and explained in the annual accounts.

Quotations from the Explanatory Notes to the Bill:

" Sections 2-5 constitute the essential requirements, which the annual accounts must meet; these provisions contain the principles which must underlie the accounts. "

" The purpose (of the accounts, insertion W.v.B.) is the giving of such information that a sound judgement can be formed on the financial position of the enterprise. "

About the adjective "sound" (section 2) and the adverbs "fairly" and "systematically" (section 3), in the Explanatory Notes to the Bill is stated:

"The information (of the accounts, insertion W.v.B.) must enable the forming of a "sound", i.e. a well-founded opinion; greatly detailed information is unnecessary, but the financial position of the enterprise, taken as a whole must clearly appear therefrom."

"In the Act the word "fairly" does not mean the same as "sound". The latter word relates to the judgement to be formed by the person studying the annual accounts, while "fairly" relates to the nature of the information to be given by the annual accounts. "Fair" information must provide the basis on which it is "possible" to form "sound" conclusions. "Possible", for it is in the mind of the beholder that conclusions are formed."

"The requirement to be systematic (section 3) refers to both the interrelationship of the items in the balance sheet and their classification and valuation."

"Being systematic in the choice of the bases of valuation implies that items of a similar nature are valued on bases that are similar in principle. In this connection it is pointed out that the Act is not aimed at prescribing a certain system. Freedom of action is allowed in respect of both the format of annual accounts and the bases of valuation."

As to this freedom concerning the bases of valuation, the Minister states in his Notes to section 5: "Firstly, the scientific pursuit of business-economics is still too much on the move for an enactment of a specific method; for the purpose of valuation the basis of current cost is as much defended as that of historic cost. It should also be noted that for certain branches of business some bases of valuation are more appropriate than others. Finally it is important not to bar the way to future developments. Therefore it is deemed appropriate not to opt for a certain method but to allow business life a certain freedom of action in this field.

This freedom is not unlimited: The bases of valuation must comply with standards that are deemed acceptable in economic and social life. The (traditional Netherlands, insertion W.v.B.) criterion "goed koopmansgebruik" - for this purpose, though not identical "generally accepted accounting principles" - is not included in the Act, because in practice this concept has acquired too wide a meaning.

Thus it occurs that, based on the principle of prudence, assets are undervalued in the balance sheet, or liabilities overvalued, to an extent that contravenes the general standards, stated in sections 2 and 3, and that, nevertheless, such valuations are accepted as "goed koopmansgebruik" - generally accepted accounting principles -. Existence of secret reserves which are of relative importance to the picture, provided by the annual accounts conflict with these standards, but is not deemed to clash with "goed koopmansgebruik". If such reserves are not disclosed in the balance sheet, it is required that the explanatory notes give such

disclosure as provides a sound insight into their significance. A similar requirement applies to movements in secret reserves, that, by being not disclosed in the profit and loss account, impede the provision of "a fair picture of the composition of the enterprise's result" (section 6). In addition to this, it is to be noted that in the past decades the concept "goed koopmansgebruik" has also largely acquired a fiscal meaning of its own with the resulting effect that it embodies some elements which, when used in the sphere of annual accounts of enterprises, have a disturbing effect on and infringe the standards, referred to in sections 2 and 3. As a striking example it may be mentioned that on the part of the tax authorities current cost is rejected in principle as a basis for computing depreciation.

It is expected (underlining W.v.B.) that organised business-life (the Council of the Netherlands employers organisations and the Council of the Netherlands trade unions, insertion W.v.B.) and the organisation of accountants cooperating therewith will consider it their duty to make an inventory of the standards used in economic and social life and to test these standards against what, in their opinion, may be deemed to be acceptable in the present social system whilst also meeting the requirements of sections 2 and 3.

The publications about acceptable bases resulting from these activities will fill a real need, experienced by the boards of enterprises and may also serve as a guide for the Enterprise Chamber of the Court of Justice of Amsterdam, when a suit about this is submitted to its judgement.

In order to avoid a possible consequential rigidity, the organisations concerned will continually have to devote their attention to developments that present themselves in this field.

The second sub-section requires that the explanatory notes give an exposition of the bases. "Give an exposition" is more than "mention": the explanatory notes will have to make it clear what bases have been chosen in the case on hand and, as an instance, what system is being applied in respect of depreciation.

Allowance for a certain freedom entails that the enterprise may change its basis of valuation. For a person wanting to trace the development of an enterprise by means of a set of annual accounts such a change would give rise to serious inconvenience since, due to the change, the figures are no longer comparable. It is for this reason that the third sub-section provides that the change itself and its effects must be explicitly stated."

APPENDIX II

Considerations concerning the Netherlands Act on Annual Accounts of Enterprises

Prepared by and under the responsibility of the Accounting Principles Boards of:

- The Council of the Netherlands Organisations of Employers;
- The cooperating Trade Unions;
- The Netherlands Institute of Registered Accountants.

A. Extract from the (definite) first set of Considerations

Introduction, Chapter 1a

Par. 31: From ancient times actual practice based the valuation of assets on their cost upon acquisition. As times proceeded, the markedly changing conditions deprived cost of its capacity to provide a reliable point of departure for arriving at a true and fair view of the composition of the net equity of an enterprise's net equity. This development necessitates the giving of additional information - either in the balance-sheet or in the notes thereto - about the current value of the components of the net equity. Current value can be defined as "the value which, dependent on prevailing circumstances, is based on either replacement value, direct realizable value, or indirect realizable value". (Insertion W.v.B.: The latter two concepts of value are explained in the reproduced extract from the paper "Bases of Accounting, other than historical costs"; Tenth International Congress of Accountants, Sydney 1972.)

Par. 36: Nowadays, the following methods for ascertaining an enterprise's income are being used in the Netherlands:

- a. sales less cost of sales, the latter being cost upon acquisition of the goods sold;
- b. sales less cost of sales, the latter being the current cost involved in actual or assumed acquisition of similar goods;
- c. a combination of a. and b., e.g. calculation of depreciation charges based on replacement values whereas the cost of raw and other materials used is based on (historic) cost.

Stocks, Chapter II, b,1

Par. 15: The following basic methods for valuation of stocks can be distinguished:

- cost or market value, whichever lower;
- the lifo-method either with or without a provision for deficient stocks or market value, whichever lower;
- the base-stock method or market value, whichever lower;
- replacement value or market value, whichever lower;
- net realizable value.

Par. 25: Application of the Lifo-method or the base-stock method aims at ascertaining the enterprise's income on the basis of the costs involved in replacing the goods as and when they are sold. Under certain conditions these methods may result in stocks being stated in the balance sheet at a value that is considerably lower than their (full) current value, a situation similar to the one that occurs when the valuation of stocks is based on direct costing. If such differences are material, the Notes will have to provide additional information about this difference. A coming "Consideration" will deal with the aspect of materiality.

B. Extract from the (Exposure Draft) of the second set of Considerations

Fixed Assets, Chapter II, a,1

Par. 24: As time proceeds, a valuation for balance sheet purposes of fixed assets, based on their cost upon acquisition, may become inadequate for arriving at a true and fair view of the enterprise's net equity, despite the fact that application of historic cost convention agrees with the requirement of section 5,1 of the Act, dealing with the acceptability of bases of valuation. If, however, the outcome of such application contravenes with the general standards, laid down in sections 2 and 3 of the Act, supplementary information must be given.

Par. 25: As regards the net equity, such supplementary information can be provided either by stating the assets in the balance sheet at their current value (in favour of the net equity), or by providing this information in the Notes.

Full account should be taken of all facts and circumstances relevant to this current value, e.g. differences in technological achievements, the complementary costs inherent in the use of possible replacing fixed assets, etc. In the opinion of the Committees, it is very seldom, if at all, that information given in the Notes about estimated values for fire insurance purposes serves this purpose because such values (i) relate to fixed assets in new condition, and, generally, (ii) are net of the value of the land and foundation. The Committees feel that, under certain conditions, such additional information as an indication of the current value, may even be misleading.

Par. 26: If depreciation calculated on the basis of cost and on current values, respectively, differ materially, information about this difference must be given either by adjusting accordingly the depreciation amount charged to income, or by stating the additional charge involved in the Notes.

C. Extract from the (Exposure Draft) of the third set of Considerations

Chapter IV, a,1: Acceptable bases for the determination of income of enterprises

Prefatory Notes

Par. 1: This chapter enters into more details with regard to the methods of ascertaining income (profit and loss), referred to in Chapter I, a, par.36, of the Introduction to the Considerations.

Par. 2: The methods referred to in the Introduction vary greatly as to both their business-economic foundation and the amounts of the enterprise's net income resulting from their application. Up till now, the outcome of theoretical analyses and practical applications has not given rise to such a consensus of opinion that one particular method has reached the stage of being generally accepted! Business-economic analyses have made it clear that the concept of profit depends to a large extent on the "continuity object" underlying the analyses (e.g. maintenance of the productive capacity of the enterprise, or of the purchasing power of either its net equity or its flow of income; insertion W.v.B.).

Next to these "continuity objects" other purposes, too, such as the objectives underlying the enterprise and its industrial and commercial activities, may have a significant bearing on the concept of income. Besides, it is only natural that, given the various information requirements there is not one method of income determination that adequately meets all needs.

Par. 3: Since there is not one method of income determination that can be qualified as being the only acceptable one with the exclusion of all other methods, it is for the management of the enterprise to select one of the possible methods. In making this selection, the management is expected to give due recognition to the objectives of the enterprise, as well as to the fact that the selected method will have to enable "the mind of the beholder" - section 2 of the Act - to arrive at a sound judgement on the outcome of the management's stewardship.

Par. 4: Having regard to the sometimes diverging information requirements of interested parties, it is not only the amount of net income achieved by the enterprise during the period under report - whichever method of determination may have been applied - but also the component parts of that amount that must be adequately disclosed because sections 2 and 3 of the Act require an analysis of net income into its significant elements.

Par. 5: The Committees hold the view that, either in the profit and loss account or in the Notes to the annual accounts, information should be given about operating income (other than interest) determined on the bases of current values as well as historic cost, the latter determination in accordance with what is laid down in paragraphs 22 to 30 inclusive of the third set of Considerations. (Insertion W.v.B.: these paragraphs, which deal with historic cost, lifo, lower net realizable value, etc., are not relevant to the present subject-matter.)

Thus, users of financial statements will be informed about the extent to which operating income has been affected by the movements in the prices of stocks and fixed assets indispensable for maintaining the enterprise's normal course of affairs. (For the concept of "indispensable assets" the reader is referred to the reproduced extract of "Bases of valuation other than historical cost".)

Par. 6: The Committees are aware of the fact that in economic and social life there is an increasing need for a determination of income and net equity, expressed in monetary units of a stable purchasing power. It is their intention to devote a future Consideration to this subject. (This Consideration has not yet reached the phase of Exposure Draft, insertion W.v.B.)

Par. 7: However much the Committees realize that not all enterprises can readily avail of the data needed for the determination of their net income and net equity on the basis of current values, it nevertheless is their firm opinion that in the present social system about net income and net equity on that basis is of such significance that provision of such information should not be omitted. In this connection the Committees would note that, as such, this information is of greater significance than its exactness. ("It is better to be vaguely right than precisely wrong", insertion W.v.B.) In most cases sufficiently reliable data and methods for arriving at acceptable approximations will be available. If, occasionally, it appears that reliable data about current values cannot be traced, this fact will have to be accepted. In such cases the Notes should explain the reasons for this deficiency.

Par. 8: There are enterprises the accounting system of which records all movements in current values. This impedes the provision of information about income and net equity determined on the basis of cost. The Committees state that under these circumstances, too, it is not an exact computation that is of primary importance; a sensible and fair approximation, for which, as a rule, adequate methods will be available, comes up to reasonable requirements.

Replacement Value Accounting (hereinafter "r.v.a.")

Par. 42: When valuing assets and liabilities and determining net income, r.v.a. bases itself on current values. The arithmetical relationship between the balance sheet and the profit and loss account is maintained by recording the changes in current values on a "revaluation account", or, "price-differences account", the balance of which - after making an adjustment for deferred income tax obligations - is a component of the

enterprise's net equity. Pursuant to section 6 of the Act, material movements in the aforementioned accounts shall be stated and explained in the notes to the annual accounts.

Par. 43: Basis of r.v.a. is the replacement value doctrine, the purport of which embraces more than the determination of income for a period alone; its main objective is the safeguarding of the enterprise's continuity. This objective lies at the root of the distinction between normal stocks on the one hand and possible shortages and surpluses of stocks on the other. It is only the movements in the value of normal stocks that are posted to the revaluation account.

Par. 44: Inherent in application of r.v.a. for the determination of income for a period is severance of the ties with historic cost. Upon each relevant change in the current value of stocks, their book value will be adjusted accordingly. Such movements - in so far as relating to normal stocks net of deferred income tax - are credited or charged to the revaluation (or price-differences) account referred to in par. 42. Changes in the value of possible surpluses or shortages are of the nature of an extraordinary item and are recorded as such in the profit and loss account.

Par. 45: R.v.a. is also applied without differentiating between normal stocks, surpluses and shortages. In such cases all changes in the current value of the entire stock are credited or charged to the account referred to in par. 42.

8

SURVEY RESULTS - PART I

1. Earlier Empirical Studies
2. Accounting Policies of Companies included in
the Survey
3. Questionnaire Results
4. Conclusions
5. References

- APPENDIX
- I An extract from the Utrecht Survey
 - II A Summary of Accounting Policies -
Group 1
 - III A Summary of Accounting Policies -
Group 2
 - IV Ratios used by Group 1 Companies

This chapter of the thesis will describe and review the results of my survey. Section One will report the results of previous empirical studies that have been carried out in the Netherlands; Section Two will describe the accounting policies and practices followed by companies included in the survey; Section Three will analyse the replies to my questionnaire. The following chapter will report and review the results of various statistical tests which have been applied to the financial characteristics of the companies included in my survey. The reasons for taking this approach have already been discussed in an earlier chapter.

1. EARLIER EMPIRICAL STUDIES

The first reported survey into the use of replacement values was carried out by de Bruin.¹ The survey covered all (259) industrial and trading companies quoted on the Amsterdam Stock Exchange and focused on the extent to which fixed assets were stated at RV. The results of the survey are shown in the table below:-

TABLE 1

Net fixed assets in million gld	VALUATION METHOD				%
	I	II	III	IV	TOTAL
0 - 10	64.1	17.3	13.5	5.1	100
10 - 25	37.2	23.3	20.9	18.6	100
25 - 75	32.4	18.9	18.9	29.8	100
75	13.0	13.0	21.7	52.2	100
TOTAL	50.6	18.1	16.2	15.0	100

Key to TABLE 1

- I - Valuation of fixed assets and depreciation at historic cost
- II - Valuation of fixed assets at historic cost, but with supplementary depreciation deducted from the historic cost of fixed assets in the balance sheet
- III - Valuation of fixed assets and depreciation in the balance sheet at historic cost and a supplementary depreciation charge in the profit and loss account
- IV - Valuation of fixed assets and depreciation and replacement value

This table shows that 131 or (51%) of the companies stated assets at HC and that RVs were only used by 39 (or 15%) of the companies. Of these 39 companies 52.2% (or 12 out of 23 forming this group) were classified by de Bruin as larger companies. These results show that RVs are not frequently reported by quoted companies in the Netherlands.

A more detailed survey by Klassen² followed. He examined the 1971 accounts of 209 companies: the valuation principles used by these companies are shown in TABLE 2.

TABLE 2

<u>FIXED ASSETS</u>			<u>STOCK³</u>	
	Method	NO OF COYS	%	NO OF COYS
Historical cost	93	45%	-	-
Replacement value	34	16%	10	5%
Balance sheet: historical cost				
Depreciation: replacement value	11	5%	-	-
Various methods	71	34%	194	95%
TOTAL	<u>209</u>	<u>100%</u>	<u>204</u>	<u>205%</u>

These results are similar to the findings of de Bruin. On the basis of this table he found that 37 companies valued their fixed assets and or inventories at RV. Of the 37 companies, Klassen was able to interview the officials of 31 of these companies. The two main issues discussed in these interviews were:

1. Why the company had adopted replacement values and not HC.
2. How the company estimated RV.

1.1 Why the companies had adopted RV

The replies are summarised in TABLE 3 below

TABLE 3

<u>REASON</u>	<u>IMPORTANT</u>		<u>UNIMPORTANT</u>	
	<u>NUMBER OF</u>	<u>%</u>	<u>NUMBER OF</u>	<u>%</u>
	<u>COMPANIES</u>		<u>COMPANIES</u>	
Balance sheet valuation of physical assets	24	77%	7	23%
Accords with product costing method	12	39%	19	61%
Effect on reported profit	19	61%	12	39%

A large majority (22) of the companies did not value the inventories at RV for balance sheet purposes (see TABLE 4) because they had only minor stocks of inventories. Most of these officials thought their method of inventory valuation was consistent with showing assets at their current value, as their stock turnover was sufficiently high. Three companies were not willing to disclose the current value of their inventories because they had large stocks and experienced large price fluctuations. Such fluctuations if incorporated in the

accounts would frustrate the calculation of a meaningful return on capital employed. They also believed that shareholders did not understand the reasons for adjusting such items through the revaluation reserve account. Twelve companies thought it desirable to calculate product costs on a RC basis, as they thought that management should know the profitability of its products on this basis. Most of these companies were of the opinion that the same basis of valuation should be used for both internal and external purposes.

Of the remaining 19 companies, 8 were of the opinion that only if they showed relatively low profits could they retain sufficient cash to finance the desired volume of production. Some companies thought they had an obligation to replace their non-monetary assets and that a false impression would be given to the outside world if profit was not calculated on a RC basis. Six companies were afraid of the effect on reported profits of automatically incorporating the increased depreciation charge as a result of revaluing their fixed assets. As a result, four of them had limited the extent to which the revaluations were incorporated in the accounts.

Although it was not possible to quantify the relative importance of the reasons stated, Klassen thought that the reasons could be divided into 2 categories:

i) those companies which consider the presentation of their physical assets in the balance sheet at their current values to be the most important feature of RVA: it follows that the calculation of profit is derived from the valuation of the assets in the balance sheet;

ii) companies which are primarily concerned with the calculation of profit on a RV basis: as a consequence they value their physical assets at current values.

In both cases, as can be seen from TABLE 4 below, most companies did not value all their physical assets at current prices.

TABLE 4

<u>CATEGORY OF FIXED ASSET</u>	<u>REPLACEMENT VALUE</u>		<u>OTHER VALUATION BASES</u>	
	<u>NUMBER OF COMPANIES</u>	<u>%</u>	<u>NUMBER OF COMPANIES</u>	<u>%</u>
Land	14	45%	17	55%
Buildings	29	94%	2	6%
Machinery	26	84%	5	16%

Klassen also found:-

i) that an important reason for departing from RVs was that the value to the business of those assets was lower than their current RC;

ii) six companies valued certain groups of fixed assets at an approximated NRV, as they did not intend to replace these assets;

iii) seven companies had stopped revaluing their assets as the company, or certain parts of it, were making losses: no attempt was made to value these assets at their EPV;

iv) five companies did not value the assets of one or more of their foreign subsidiaries at current cost in the consolidated accounts because the subsidiaries were independent and used their own accounting standards;

v) seven companies valued their land at HC and eight used a fixed percentage increase per annum as a valuation basis.

Two main reasons were advanced for the position taken as regards the valuation of land. These were

i) land is not important for profit determination as the companies had no intention of selling it;

ii) as there is no obligation to replace the land RV was not relevant.

1.2 How companies estimated RV

Land

The 14 companies that periodically determined the RV of their land used various methods. Most companies referred to the price of land for industrial purposes. Others revalued their land by reference to the revaluation percentage applied to buildings.

Machinery and buildings

Not unexpectedly Klassen found two main problem areas:-

i) which of the various data sources provided the most appropriate current value;

ii) the incorporation of technological change.

Both problems were examined in some detail.

i) Source data for the valuations

TABLE 5 below shows the sources from which the valuations were derived. A number of companies (9) used the reports of independent valuers, who estimate the value of fixed assets for fire insurance purposes once every two and a half years. Eight companies used their own estimates: in

general they applied a percentage write-up for all buildings and machinery. Decisions on the percentages to be applied were, in some cases, based on investigations of the price increases recorded for certain assets. Five companies derived the valuation of their machinery to a large extent from the information of suppliers. Six companies had not revalued their fixed assets (or a substantial part of them) because of either:-

1. losses, or
2. technological improvements: the effect of which was that no adjustment was needed to the book values.

TABLE 5

<u>SOURCE</u>	<u>BUILDINGS</u>		<u>MACHINERY</u>	
	<u>NUMBER OF COMPANIES</u>	<u>%</u>	<u>NUMBER OF COMPANIES</u>	<u>%</u>
Index numbers	6	21%	3	12%
Appraisal for insurance purposes	9	31%	9	35%
Company's estimates	8	27%	4	15%
Information from suppliers	-	-	5	19%
No revaluation	<u>6</u>	<u>21%</u>	<u>5</u>	<u>19%</u>
	<u>29</u>	<u>100%</u>	<u>26</u>	<u>100%</u>

One company, rather significantly, was going to return to historic cost accounting as RVA would result in a large fall in reported earnings and in its opinion, make it more difficult to borrow money on the international capital markets.

The incorporation of technological changes

Klassen found that a number of different methods are used and these are shown in TABLE 6.

TABLE 6

<u>METHOD</u>	<u>NUMBER OF COMPANIES ALL BUILDINGS AND MACHINERY</u>	<u>NUMBER OF COMPANIES PART OF BUILDINGS AND MACHINERY</u>
No deviations from external data	6	3*
Lower percentage of revaluation	8	1*
Individual estimates of required investment costs	4	3**
Estimation by means of cost comparisons	<u>3</u>	<u>1**</u>
	<u>21</u>	<u>4 = 25***</u>

* Mainly buildings

** Mainly machinery

*** Four companies are not included, since they did not revalue their fixed assets over a long period.

The need for adjusting price indices to account for technological changes depends upon the method of calculating these indices. The Dutch Bureau of Statistics does not calculate a separate index of industrial buildings. The nearest equivalent that it publishes is an index of house building costs. Technological changes and productivity improvements are only incorporated in the building costs of houses of a certain type. The price indices for machines are intended to measure the price increase or decrease of groups of identical machines. If old machines are replaced

by newer improved models, the price increase or decrease is calculated by reference to the price of the inputs of the new machine. This means that if a new machine has a larger capacity but has the same price as the old machine, based on input costs, no price rise or fall is recorded. Further Dutch companies were not able to make estimates using the prices of imported machinery and equipment as the available statistics were not detailed enough for most companies' purposes.

Where buildings and machinery are valued by reference to appraisals for insurance purposes, the estimates are based on the assumption that a replica will be rebuilt if the original building (or machinery) is destroyed by fire. No account is taken of technological changes. Since these valuations are only periodic they tend to be relatively high. Another reason is that where fixed assets are partially damaged by fire the overall damage is proportionately higher and the payment by the insurance companies should cover the proportionately higher cost of renewal. However whilst it is obvious that the various indices and valuation are deficient in that very little account is taken of technological change, in practice there was no real problem as most officials who were interviewed were of the opinion that their company's assets experienced only slight technological change.

Non-identical replacement, in the sense of replacement by machines used for the production of new products, or the introduction of new products by merchandising companies was not considered to be replacement. If companies closed old facilities no adjustment was usually made to the revaluation reserve account.

Inventories

The current value was ascertained from recent invoices and or market quotations.

1.3 Klassen's other findings

Frequency with which companies revalued their assets

TABLE 7 shows that approximately half of the interviewed companies revalue their fixed assets once a year: all companies which used index numbers were among this group. The rest do not revalue their assets each year; companies using appraisals only revalue their fixed assets once every two or three years. Companies which do not have a fixed period, revalue their assets only 'if circumstances require it'.

TABLE 7

	<u>FREQUENCY</u>	<u>NUMBER OF COMPANIES</u>	<u>%</u>
ONCE PER:	1 year	13	45%
	2 years	2	7%
	3 years	4	14%
	4 years or more	1	3%
	no fixed period	5	17%
	no revaluation	4	14%
	TOTAL	<u>29</u>	<u>100%</u>

The magnitude of the yearly fixed asset revaluations

The published financial statements of the interviewed firms for the period 1960-1972 were examined. Only 15 companies (out of 29) provided sufficient information to calculate a yearly revaluation percentage. The results are shown in TABLE 8. They indicate that the average percentage

yearly revaluation during the period varied between 0% and 8%.

TABLE 8

AVERAGE REVALUATION PER YEAR AS A PERCENTAGE OF BOOK VALUE

(1968-1972)

<u>PERCENTAGE</u>	<u>NUMBER OF COMPANIES</u>
< 2%	5
2 - 4%	4
4 - 6%	5
6 - 8%	1
	<hr/>
TOTAL	15
	<hr/>

Obviously these revaluations imply a higher charge for depreciation as compared to depreciation based on historic cost.

Depreciation

The magnitude of the difference between the two bases is shown below in TABLE 9 and the effect on profit after taxation in TABLE 10.

TABLE 9

<u>PERCENTAGE OF DIFFERENCE</u>	<u>NUMBER OF COMPANIES</u>
< 5%	1
5 - 10%	4
10 - 15%	1
15 - 20%	4
20 - 26%	4
	<hr/>
	14
	<hr/>

TABLE 10

<u>DIFFERENCE IN PROFIT AFTER TAXES AS A PERCENTAGE OF CRVA PROFIT</u>	<u>NUMBER OF COMPANIES</u>	<u>PERCENTAGE OF COMPANIES</u>
< 5%	2	16.7
5 - 10%	4	33.3
10 - 15%	1	8.3
15 - 20%	1	8.3
20 - 25%	4	33.3
<u>TOTAL</u>	<u>12</u>	<u>99.9</u>

It is clear from TABLE 10 that of the 12 companies Klassen examined the effect on 6 of the companies' profits after tax was <10%. However, four of the companies' after tax profits were affected by more than 20%. As facts in themselves this information is useful. However, it is unfortunate that he did not relate these figures to shareholders' funds to see whether the rankings differed depending on whether HC or RC return on equity was being considered. This topic will be considered in much more detail later in the chapter.

The calculation of Profit

Of the companies who were interviewed all but one based their depreciation charge on the new RV. It was found that straight line depreciation was used. Some companies continued to depreciate assets even though their book value was zero: the reason being that they had underestimated their useful lives. In such cases the extra depreciation was credited to a revaluation reserve or an equalisation account, from which amounts were deducted if the useful life of some of the assets had been overestimated.

Only one company took account of back-log depreciation. The other 28 companies thought that such an adjustment was unnecessary. Some companies stated that profits would be too low if back-log depreciation was adopted; others contended that because of the diversity in useful lives of their assets back-log depreciation was not needed.

Companies, who presented cost of sales at RV, based the necessary adjustments on replacement values during the year. Only one company used the concept of normal stock to calculate the cost of sales and to revalue inventories. This was done to identify speculative positions on inventories. The other companies said that they did not speculate in inventories. The accounting policies adopted by ten of the companies were such that a form of current cost of sales was charged in the profit and loss account. They did this by either using base-stock methods or by calculating the increase in inventory costs over the period and separately charging it against profits.

No company took their financial structure into account when calculating profits and so no part of the revaluation reserve was considered to be part of profit.

Klassen's conclusions

i) Companies included in his survey did not use a theoretical standard of capital maintenance to calculate their profits, but tried to calculate the current cost of the physical assets sacrificed during the period. This calculation was complicated because of the absence of reliable data. As a result the calculated replacement values were approximations. No attempt was made to calculate the present values where this was appropriate;

instead companies stopped writing the assets up or valued them at NRV. He concluded that there were substantial differences between Limperg's theory and its practical application.

ii) The motivation for using some form of RV accounting was to show lower profits. (TABLE 10 shows that this is not always significant). Most companies considered that profits were the most important source of finance and relied heavily on internal financing. As a result they thought it dangerous to show high profits as they considered that it induced high wage and dividend claims. In contrast to this view some companies wanted to expand their financial resources by issuing new stock and loan capital; they therefore feared that low profits might endanger their position in the capital markets.

In addition to points (i) and (ii) above, the main points which emerge from his survey are:-

1. Only a small percentage of companies use a modified form of replacement value accounting or charge RV depreciation in their profit and loss account.
2. Of the companies classified as those who applied RVA very few valued all their fixed assets at RV and more than half the companies valued land on a different basis.
3. The various indices and appraisals used to approximate RVs were found to be deficient.
4. The effect on reported profits of twelve companies examined varied between less than 5% to 25%.

The last study which will have relevance for this chapter was carried out by a team of researchers at the University of Utrecht.⁴ These researchers investigated the 1972-1973 annual accounts of fifty of Holland's largest quoted companies and addressed themselves to two questions:-

1. Whether these companies complied with the Dutch Act on Annual Accounts, and
2. To what extent these accounts already met certain business economic criteria laid down by the researchers.

The researchers concluded:-

- i) that the accounts conformed only marginally with (the very general, multi-interpretable and in terms of business economics, ambiguous) legal requirements;
- ii) that generally they failed to conform with the informational requirements of business economics.

The significance of this study for this chapter is the section in the researchers' report which focusses on valuation methods⁵ other than HC. The valuation policies followed by these companies are shown in APPENDIX I: this table has been reproduced from the Report⁶. The main conclusions, based on this table, are summarised below:⁷

1. Only two companies, Meneba and Philips, used AVMA for:-
 - i) all relevant assets and liabilities in the balance sheet and where applicable, the profit and loss account;
 - ii) in the internal accounts.
2. Two companies, Heineken and Nyverdal Ten Cate,

satisfy the criteria set out in 1.(i) and 1.(ii) but do not clearly define or describe how and why they use AVMA. If Heineken and Nyverdal Ten Cate are considered users of AVMA only four out of the 50 companies are aware of the need for inflation accounting. As these 4 companies belong to different industries the other 46 are in no position to state that inflation accounting could not be used in their industry.

3. Eight companies, KSH, Naarden, Elsevier, Océ, VNU, Wessanen, Gamma, ACF, are beginning to systematically introduce some form of AVMA. However they only use this method for fixed assets, with a statement of their actual value (RC or NRV) in the balance sheet or in the notes. Of these companies one (Océ), with the exception of stock in the balance sheet, made all the necessary adjustments. It is not clear from the accounts of Océ whether the balance sheet value represents actual value (ie RC).

4. The balance sheet of the remaining 38 companies were totally or partially HC based. Of these 38 companies, 17 used a modified form of AVMA in their internal accounts. 21 provided supplementary information compiled on an AVMA basis in their notes.

5. Twelve of the 38 companies partly apply actual value methods (hereinafter AVM) in their profit and loss accounts. Two of those 12, Holec and KNP, use actual AVM for a certain part of their stock in the balance sheet, whilst their fixed assets, are valued at actual value in the notes. One company, Hoogovens, made no mention of the actual value of fixed assets, but valued stock in the balance sheet at actual value. Six of these 12 companies, Gist-Brocades,

Buhrmann, Bols, KBB, Ballast-Nedam and Pont, state an actual value for fixed assets in the notes. Two of these 12 companies, Shell and ACF, state the actual value of stock in the notes. One company, VMF Stork, state that the profit and loss account has been partially compiled on an AVM basis, but without giving any explanation in the notes of how the affected items are valued. Three out of the 38 companies, Akzo, Unilever and Nutricia, state explicitly that they try to compensate for not using AVMA through the profits available for distribution. In the note which follows this statement Nutricia and Akzo state the actual value of their fixed assets.

6. Of the remaining 21 companies which do not use AVM in the balance sheet or in the profit and loss account, 7 - KNSM, Kluwer, Telegraaf, Desso, Bredero, Stein and Pakhoed, do not go further than stating the actual value of the fixed assets in the notes. Five of them, VRG, Ahold, Deli, Internatio & Lindeteres, only do this for part of their fixed assets. Four companies, Van Nelle, Hagemeyer, Hunter, Douglas and Ogem, only give a slight indication of their fixed assets' actual value. Four of the 21 companies, KLM, NSU, Van Ommeren and Bos Kalis consider AVMA useless, as they do not mention anything about actual values in their Annual Report.

7. Only six companies Akzo, VNU, Wessanen, Nyverdal Ten Cate, Bos Kalis and Pakhoed made statements about the effects of technology on the value of their assets.

It is clear from the Utrecht survey that:-

i) their findings are very similar to those of Klassen's as regards the extent and use of AVMA;

ii) most of the companies had made some mention of actual values in either the notes, profit and loss account or balance sheet;

iii) many of the actual value adjustments were of a partial nature and there was no systematic trend of adjustments amongst companies the researchers examined.

2. ACCOUNTING POLICIES OF COMPANIES INCLUDED IN MY SURVEY

Klassen's survey and the report of the Utrecht researchers was not brought to this writer's attention until his research was at an advanced stage. However, as we shall see, my research largely complements, rather than duplicates their earlier surveys. It was clear from de Bruin's survey and from contacts in Holland that most companies only published historic cost data. However, NIVRA⁸ kindly sent me a list of companies who published some form of current cost information. This information was based on a survey⁹ carried out by the Dutch Institute on the accounts of 129 companies for the 1970-1971 accounting period. Twenty-five companies were identified as companies using some form of RVA. I decided to base my survey on the 1975 accounts. The companies were then divided into two groups. The criteria for deciding which group a company was assigned to was whether the company valued part or all of their fixed assets at RC or some approximation to current value. Thirteen companies satisfied this criteria. The other 12 were identified as companies who made some form of ad-hoc adjustment on profit and or reserves to reflect increased replacement costs. The 13

companies will be referred to as Group 1 companies and the other 12 as Group 2 companies. The companies comprising these two groups are listed below.

1. <u>GROUP 1</u>	<u>GROUP 2</u>
1. Philips	Gist-Brocades
2. Heineken	Buhrmann-Tetterode
3. ACF	Ballast Medam
4. Wassanen	Holec
5. Meneba	VMF Stork
6. Nijverdal Ten Cate	Unilever
7. Akzo	Bols
8. KSH	HBG
9. Océ	KBB
10. Elsevier	Nutricia
11. Naarden	KNPM
12. Gamma	NSU
13. VNU	

A questionnaire ¹⁰ in Dutch, was sent to each of these companies. In order to put the replies to the questionnaire in context, it is necessary to describe the accounting policies followed by these companies. These are summarised in APPENDICES II AND III of this chapter. The main features of these appendices are:-

1. Only 3 companies, Philips, Heineken and ACF based their charges for cost of sales and depreciation exclusively on replacement values.

2. Two others, Meneba and Wessanen, based their charge for cost of sales at RV and most of their depreciation provision;

3. Nijverdal Ten Cate based their depreciation charge on the balance sheet value of their fixed assets and in the cost of sales charge took into account the price increase which had occurred to items included in either work-in-progress or finished products: other stocks on hand were valued at HC;

4. Akzo in the notes to the accounts provided a detailed RV profit and loss account and balance sheet;

5. Six companies, KSH, Océ, Elsevier, Naarden, Gamma and VNU charged cost of sales at HC, but charged mainly RV depreciation;

6. Taxation: in 5 companies' accounts, Nijverdal Ten Cate, KSH, Elsevier, Naarden and Gamma it was not clear whether the taxation charge was based on the replacement profit or the HC profit;

7. Six companies, Philips, Heineken, ACF, Wessanen, Meneba and Océ state in the notes to their accounts that they base their taxation provision on reported profits and not on taxable profits; the difference they adjust through the deferred tax account;

8. Only 4 companies, Philips, Heineken, ACF and Océ state all their fixed assets at RV;

9. The other 8 companies valued most of their fixed assets at either RV or at an appraisal value: the remaining fixed assets of these companies were valued at HC;

10. Only one of the companies, KSH, credited the full amount of the increase in the value of the fixed assets to the revaluation surplus without making a provision for deferred tax;

11. With the exception of Elsevier and VNU, inventories were mainly valued at lower of cost or market value;

12. The inventories of Elsevier and VNU were valued on a special basis, this reflects industry factors as both companies were publishing houses;

13. Eight companies, ACF, Wessanen, KSH, Elsevier, Naarden, Gamma and VNU made no mention of how they treated foreign currency differences attributable to fixed assets;

14. Philips, Heineken, Meneba and Océ adjusted such differences through their revaluation surplus account: Philips and Heineken also stated that if the surplus was insufficient the unabsorbed balance would be charged to the profit and loss account;

15. Akzo charged these differences directly to equity;

16. Two companies, Philips and Wessanen, mentioned in the notes that account was taken of technical changes.

17. Two companies, Gamma and VNU also provided information about the depreciation rates they used.

These findings are similar to those of the Utrecht researchers and as regards the valuation of fixed assets, similar to those of Klassen. This is to be expected as the Utrecht researchers examined the same companies, albeit for a different accounting period. It is not possible to extract from Klassen's book which fourteen companies he examined: however, it is likely that he examined most of the companies in my sample, as his sample was drawn from the same relatively small population. Whilst it is difficult to compare my survey with the Utrecht survey of the same companies, it is noticeable that these companies are gradually increasing the

use made of RVA (or current values) in their published accounts. For instance there is only a brief mention in the Utrecht report about the treatment of foreign currency differences attributable to fixed assets; as was noted above a note appeared in five companies accounts on this matter. Another example of additional disclosure is in the case of Wessanen and ACF. Both companies now publish current cost accounts whereas the Utrecht survey was only able to note that they were beginning to introduce AVMA. Having reviewed the accounting policies of the Group 1 companies it is now appropriate to review those of the second group of companies.

The survey findings relating to Group 2 companies will be much shorter as they make fewer current value adjustments to their accounts. It was found that:-

1. Eleven companies provided additional replacement value depreciation, either in the profit and loss account, or as a charge against after tax profits (ie in the profit and loss appropriation account);

2. One company, NSU, made no extra provision for depreciation, but in a separate statement calculated the effect of replacement value depreciation on its historic cost profit and provided information about shareholders' funds and fixed assets on a current value basis;

3. It was not clear from two companies' accounts, Ballast-Nedam and KBB, the basis on which the tax provision has been calculated;

4. Three companies, Gist-Brocades, Buhrmann-Tetterode and KNPM, took the additional depreciation in account in calculating the tax provision; as with the Group 1 companies, the

additional tax payable as a result of the extra depreciation not being allowed for tax purposes is adjusted through the deferred tax account;

5. With the exception of Nutricia and Unilever the extra depreciation is taken to a reserve account and forms part of shareholders' funds;

6. In the case of 5 companies, Gist-Brocades, Buhrmann-Tetterode, VMF Stork, KBB and KNPM other adjustments are passed through these accounts: the type of adjustments vary from company to company, but usually relate to a miscellaneous revaluation or devaluation of an asset (often a subsidiary) owned by the company effecting the adjustment.

As the number of adjustments made by the Group 2 companies is so small it is not proposed to compare my findings with those of the Utrecht researchers and little could be achieved by such a comparison. Having discussed the accounting policies of these two groups of companies it is now appropriate to consider the replies to my questionnaire.

3. QUESTIONNAIRE RESULTS

Of the 24 questionnaire that were mailed, 13 completed replies were received. Another 2 were secured by interviewing an official of a company that was sent a questionnaire and by interviewing an official of another company that was not sent a questionnaire because a prior meeting had been arranged. Nine completed replies were received or obtained from Group 1 companies and six from Group 2 companies. Of the Group 1 companies, one, KSH said they were now in liquidation

and were not able to answer the questionnaire. No replies were received from Nijverdal Ten Cate, Océ and ACF. In Group 2, KBB said that the internal accounts were not RC based and so it was inappropriate to complete the questionnaire. A reply in similar vein was received from Bols. This left 5 effective replies.

The answers ¹¹ to the questionnaire will be analysed by comparing the replies of the Group 1 companies with those of the Group 2 companies.

TABLE 11

<u>QUESTION 1</u>	<u>GROUP 1</u>		<u>GROUP 2</u>	
	<u>NO</u>	<u>YES</u>	<u>NO</u>	<u>YES</u>
Why was RC introduced?				
a. Dividends	9	-	5	-
b. Wage negotiations	9	-	5	-
c. Price controls	8	1	3	2
d. Other reasons	-	9	-	5

The other reasons stated by these companies are summarised below.

Group 1 Companies

1. A better understanding of capital and the earning capacity of the company.
2. To give a true and fair view.
3. It gives a more representative picture of capital. Sufficient funds will be reserved for replacement of assets consumed.
4. To ensure the continuity of the business.
5. It enables a better judgement to be formed in

relation to the continuity of the company.

6. Only a balance sheet based on actual prices reflects a true and fair view of the shareholders' equity and net income.
7. HC does not present a true and fair view of the company either for the evaluation of dividends and wages or for the calculation of revenue and cost; RVA is closer to reality.
8. The only correct system of valuation for both the annual accounts and the determination of the cost price of our products.

All 8 companies appear to have introduced RVA because they think it shows a more representative picture of the company's affairs. Two of the companies emphasised the company's continuity whilst another pointed out its appropriateness for evaluating dividends and wages.

Group 2 Companies

1. The profit and loss account shows a true and fair view.
2. It eliminates the fixed asset price increase and better represents profit.
3. Better insight into the real profits and profitability of the company's various activities.
4. Valid determination of profits.
5. Maintains net assets.

The trend of answers are similar to those given by the Group 1 companies. Four emphasise the more realistic profit figure whilst a fifth emphasises the maintenance of net assets aspect.

The second question asked when RCA was first introduced? The reason for asking this question was to ascertain how long these companies had been using the system. If companies had been using the system for some time they must have fairly settled views about its strengths and weaknesses. TABLE 12 has been compiled on the basis of how long RCA has been used by these companies.

TABLE 12

	<u>5 YEARS</u>	<u>5 YEARS & 15 YEARS</u>	<u>15 YEARS</u>
GROUP 1	0	4	4
GROUP 2	1	2	2

NB Years calculated by reference to when the questionnaire was mailed.

It is self evident from this table that with one exception only, most of the companies have been using RCA, or some form of RCA, for a number of years. Even the exception had been using it for four years.

Question Three - Asked if RCA was used to evaluate the internal performance of the group as a whole: if the answer was yes, they were requested to specify the ratios they used. With one exception all the companies used RCA to evaluate combined performance. The exception was in the Group 2 companies TABLE 13 summarises the replies.

It is noticeable that companies in Group 1 make greater use of RC based performance measures than companies in Group 2.

This was especially the case as regards the return on equity, profit/sales and the use of other ratios. Companies were also asked to specify which other ratios they used. Most of them referred me to their accounts. All of them published such ratios as dividends and earnings per share and also a ratio not often published in the accounts of English companies, cash flow per share (cash flow = net profit + depreciation). In addition most companies highlighted the relationship between net investment and depreciation: in most cases this information covered a five year period. Apart from these ratios there was no other discernable trend in the use made of particular ratios. It is clear from APPENDIX IV that most companies used a variety of ratios, which probably reflects industry factors.

TABLE 13

	<u>GROUP 1</u>		<u>GROUP 2</u>	
	<u>YES</u>	<u>NO</u>	<u>YES</u>	<u>NO</u>
a. Return on Capital Employed	6	3	3	3
b. Return on Equity	8	1	1	5
c. Profit/Sales	8	1	2	4
d. Debt/Capital Employed	5	4	1	5
e. Other ratios	9	-	1	5

Although companies were asked to define the ratios they used, most companies referred to their annual reports. It was not clear from 7 of the reports what definition of capital employed was being used. Sources in the Netherlands indicated that most companies would apply the definition used by Philips and Heineken, that is, fixed assets plus current assets and not as in the UK, fixed assets plus net current assets.

Companies were then asked if RCA was used to appraise each individual company within the group; companies replying in the affirmative were asked to specify the ratios they used. The answers are summarised in TABLE 14 and TABLE 15

TABLE 14

<u>GROUP 1</u>		<u>GROUP 2</u>	
<u>YES</u>	<u>NO</u>	<u>YES</u>	<u>NO</u>
8	1	3	3

These answers are similar to the replies to the first part of Question 3. One company in Group 1 stated that RCA was used but was of no consequence as evaluation was based on a combination of cash flows and pay-back period. A Group 2 company stated that it evaluated subsidiaries on a cash-flow basis and set a target of 15% of capital invested.

TABLE 15

<u>RATIO</u>	<u>GROUP 1</u>		<u>GROUP 2</u>	
	<u>YES</u>	<u>NO</u>	<u>YES</u>	<u>NO</u>
a. Return on Capital Employed	8	0	3	3
b. Return on Equity	3	5	2	4
c. Profit/Sales	8	0	2	4
d. Debt/Debt + Equity	3	5	0	6
e. Any other ratio	5	3	1	5

This table shows that the Group 1 companies made more use of ratio analysis than the Group 2 companies. The extent of this use was less than that indicated by TABLE 13 for both groups and shows that companies made greater use of ratio analysis in appraising group performance than in evaluating the performance of subsidiaries within a group. However, as with TABLE 13, TABLE 15 clearly shows that companies do actually use RC ratios.

Four replies to part (e) of this question referred to the companies' answer to the same part of the previous question. It must be assumed that the other ratios used to evaluate group performance were also used to evaluate the performance of subsidiaries within the group. The fifth company stated that it also used Asset Turnover (sales divided by capital employed). The only company in Group 1 which stated that it did not use RCA to evaluate the performance of its subsidiaries said that for companies in high inflation countries (eg Latin America) they used key factors and ratios derived from historical figures adjusted for legally admitted inflation corrections.

Only one company in Group 2 used any other ratios. Special factors affected the performance measure it could use. This was because the production cycle of the company's operations was often in excess of one year and so financial ratios were inappropriate. However, performance was carefully monitored by a number of production ratios which had been developed internally and with the help of McKinsey's. Where appropriate within the group, the production ratios were supplemented by financial measures of performance.

The analysis to date has focused on three questions:-

1. Why was RCA (or as some Dutch companies refer to it - Current Value Accounting) introduced?
2. Is RCA used to evaluate group performance?
3. Is RCA used to evaluate the performance of companies within the group?

Questions 2. and 3. highlight the use of RCA information in ex-post evaluations; the next question focuses on the use of RCA information in ex-ante decision making.

Question Five asked whether RC was incorporated in:-

- a. budgets
- b. standard costs and variance analysis
- c. prices

The replies are summarised in TABLE 16 below

TABLE 16

<u>DECISION</u>	<u>GROUP 1</u>		<u>GROUP 2</u>	
	<u>YES</u>	<u>NO</u>	<u>YES</u>	<u>NO</u>
a. Budgets	8	1	4	2
b. Standard costs and Variance analysis	8	1	5	1
c. Prices	7	2	5	1

This table suggests that greater use (especially by companies in group 2) was made of RC data in ex-ante decision making than in reviewing ex-post performance. Only one company, a Group 2 company, gave a reason for not using replacement costs in its budgets or standard costs. The management of the company were insistent that the accounting information system within the company was cash flow based and so no account was taken of depreciation: it was not appropriate to take account of increases in the cost of goods sold as the company was a shipping line. In relation to standard costs, the official who was interviewed thought the question inappropriate as the company supplied services such as transporting cargo and many of these services were not susceptible to standardization. Control was effected by a combination of fierce competition (shipping rates have declined dramatically over the last few years) and a target rate of return set by management on the capital it had invested in the particular subsidiary or division.

Only three companies did not incorporate replacement costs in their prices. All three companies said that they operated in fiercely competitive markets and that in the short-run they had to accept the prevailing market price. In times of recession this was often less than a replacement cost price; the converse was true in periods of economic prosperity.

In recent years, as the pace of inflation has quickened, many management accountants have become dissatisfied with the standard costing and variance analysis as regards the treatment of price variances. They have argued that when prices are increasing rapidly the standard prices are very quickly out-of-date but it is often a cumbersome and expensive exercise to revise price standards. It would therefore be more convenient and less expensive if a simple technique could be devised for identifying the underlying causality of a given adverse price variance. This would enable the inflationary element to be isolated in the price variance assessment of the buyers' performance. This thinking was behind the next question: this asked how price variances attributable to inflationary price increases were accounted for. It appears from the answers that this question was misunderstood by most companies and given the translation problems that arose in compiling the question it was probably an overambitious question. However some insight was obtained into how this problem was tackled during the course of one interview with a senior company official of a very large manufacturing company and several telephone conversations with officials of companies who had been sent the questionnaire.

One of the Group 2 companies stated that the difference

between budget and actual prices was analysed but gave no further detail despite space in the questionnaire. Another Group 2 company stated that important raw materials were regularly revalued and unimportant raw materials were revalued once a year: differences that arose from the revaluations were taken to a price difference account and analysed. The official¹² of the company who was interviewed said that price variances were kept to a minimum by monitoring prices very keenly. Indeed, several semi-autonomous departments within the company monitored prices. He felt that any variance attributable to buying would be negligible and that the internal control system of the company ensured that the inflationary price variance would be minimal.

A Group 1 company stated that the prices it paid for its purchases were highly dependent on market conditions and that it would be inappropriate to use highly sophisticated methods to analyse the price variances. This statement is undoubtedly true but it would not rule out ad-hoc methods for analysing the differences. No more details were provided by this company but it seems difficult to believe that such methods were not used.

Another Group 1 company said that there was no uniform system for analysing these differences and that it varied from company to company.

As stated above the writer followed this question up by telephoning the officials of several companies who were sent the questionnaire. These companies were in Group 1 and produced manufacturing goods. One company official stated that the price of stocks was very closely monitored by the internal

reporting system. If at the end of the budget period (which was five weeks) there were large price variances these were investigated in some detail. What constituted a large variance depended on the circumstances affecting the company at that particular time. A similar system was in operation at the other company that was contacted. The officials of both companies thought that most companies would use similar methods to analyse their price variances. These replies show that no special method is used to isolate the various underlying causes; instead control is effected by closely monitoring raw material prices. In the absence of inflation the need for such tight control would not be as crucial. From these replies it is difficult to avoid the conclusion that these ad-hoc methods are perceived by management to be effective. Whether or not they are is beyond the scope of this research.

Having analysed the use to which the RC data is put, the next set of questions will examine the underlying basis on which this data is compiled. Some of these questions will duplicate, at least in places, my survey of accounting policies. This is an unavoidable necessity; duplication will be kept to a minimum.

The first question concerned the basis on which current values were calculated for stock, land, buildings and plant and machinery. In the case of stock only 13 replies were received because 2 companies failed to answer the question: 8 were from Group 1 companies and 5 from Group 2. With the exception of one company, current value was equated to market value. Judging from the notes to the accounts of these companies market value must be taken to mean net realisable value. The exception arrived at current value by using internally produced indices,

where an appropriate index was not published by the Government Statistics Department. TABLE 17 summarises the methods used for land and buildings and plant and machinery.

TABLE 17

	GROUP 1			GROUP 2		
	INDEX	MARKET VALUE	OTHER	INDEX	MARKET VALUE	OTHER
Land	3	3	3	4	-	1
Buildings	4	2	3	4	-	1
Plant and machinery	4	2	2	4	-	-

It should be pointed out that one Group 1 company and one Group 2 company failed to supply the relevant information about the basis on which plant and machinery was valued. In addition one company in Group 1 used both indices and market values for buildings and plant and machinery; in compiling the table it has been assumed that only market values are used.

As the number of adjustments companies in Group 2 make are fewer and less comprehensive, it is not surprising that one method (indices) predominates and is one which is very cheap and easy to operate. It follows that companies in Group 1 are likely to use several methods: the method depending on what economic reality the company is trying to represent. However, whilst other bases are used it is clear from this table that companies in Group 1 use indices more than any other method. No doubt for the same reasons as companies in Group 2.

The next question asked those companies, who had marked the 'other methods' column as an answer to the previous question, to specify those methods. The one Group Two company to whom this question was applicable stated that for insurance

purposes the fixed assets had to be valued once every two years; 80% of this value is then incorporated in the books of accounts. We saw from Klassen's survey that insurance values typically overstate an asset's value and by taking 80% the company is probably making a fairly accurate appraisal of its market value. The replies of companies in Group 1 are set out below.

1. A company who used indices stated that sometimes there were exceptions, these were not specified but as much has been written about this particular company it seems (from these sources) that NRV is used when RV is greater than EPV.
2. Plant and machinery: the valuation is based on an index derived from actual market value.
3. RV is based on an appraisal of the most efficient technical and economic configuration of production.
4. The value of land and buildings is based on rental values.
5. Periodic valuations supplemented by indices in the interim period.
6. A uniform percentage is applied after correcting for technological obsolescence. Once every five years the position is reappraised by reference to the insurance valuation reports.

These replies indicate that the other methods are supplemented by the use of indices. This reinforces the findings based on TABLE 16 and it follows that the accuracy of the various adjustments is extremely sensitive to the accuracy or otherwise of the indices used. Klassen's survey showed that some of the published indices were deficient in a number

of important respects and no account was taken of changes in productivity. It may be that internally compiled statistics might be more accurate as account can be taken of the deficiencies revealed by Klassen, such as technological obsolescence and productivity changes. The converse might also be true as management may wish to influence its results by tampering with the indices. On the basis that externally based indices were more objective and less accurate and that internally based indices might be more accurate, but more open to abuse, companies were asked which category they applied. The results are summarised in TABLE 18.

TABLE 18

	<u>GROUP 1</u>	<u>GROUP 2</u>
Internal	1	-
External	4	3
Both	3	2

This table shows that only one company relied exclusively on internal information. No systematic trend could be detected from the answers, but the compilation of internal indices appeared to be necessitated by the absence of suitable external indices. This was certainly true in the case of two very large multinational companies. Most companies said that they applied the indices published by CEA (The Dutch Government Statistical Office) but three companies made reference to other sources. One company in Group 1 said that it also applied indices published by semi-governmental organisations: another company in the same group said that it used suppliers' price lists. A Group 2 company said that insurance appraisals were the basis of their valuations.

Companies were then asked if market values (ie for stock and where applicable fixed assets) were compiled on the basis of internal estimates or by independent valuers.

TABLE 19

	<u>GROUP 1</u>	<u>GROUP 2</u>
Internal	1	1
External	3	2
Both	4	1

One company in Group 1 stated that in the main internal information was used to value stock and external appraisals were used to value fixed assets. Whilst the other companies in the 'both' category did not specify the use to which each category of information was put, it seems not unreasonable to suggest that this policy was followed by the other companies. One company in Group 2 used mainly external information and so was classified as external. As with the previous question the type of information used by companies probably reflects data availability, rather than any deliberate policy. The next three questions will focus on the criticisms of RCA.

In several of the earlier chapters it was stated that one of the main criticisms of RCA was that no account was taken of changes in technology. The practical significance of this criticism loses much of its force if companies publishing RC information operate in industries where the change in technology is very slow or even static. The accounts of companies included in this survey were examined to get some idea of how they were being affected by technology. The overall impression which was confirmed by one company official, was that whilst individual segments might be affected by rapid change, this

this was far from typical of Dutch industry, indeed, the official who held a responsible position in a large Dutch company, thought that the change in technology in Dutch industry in general was very slow and in some cases static. In practical terms changes in technology are not a problem for Dutch companies who publish some form of RC information.

As some sectors of each company included in the survey would be affected by technology, companies were asked how technological changes were treated in their accounts and with particular reference to the RC of the machinery subject to the change in technology and the depreciation policy of existing machinery. Eight effective replies were received from Group 1 companies and two from Group 2 companies. The lack of response from the Group 2 companies is not surprising: these companies only publish RC information in the profit and loss account and so the problem is not as acute as for the Group 1 companies. The various replies are set out below.

Group 1 Companies

1. The value of the affected asset takes full account of any change in technology.
2. Decreases in value as a result of technological changes are taken into account; on average the estimated decrease was 1% for buildings and 2% for machinery and equipment.
3. The external information used to value plant and machinery takes into account technical obsolescence.
4. Changes in the bases of valuation are explicitly stated in the annual report.
5. The machines would not be revalued. (It is not clear from this statement on what basis these assets

would be stated in the balance sheet).

6. Account is taken of such changes and explained in the published accounts.
7. Changes in techniques are taken into account and explained in the accounts.
8. Changes in techniques will be taken into account in determining the RV of the equipment affected.

Group 2 Companies

1. Special consideration is given to the affected assets; account is then taken of this in the depreciation provision.
2. No account is taken of changes in technology. Depreciation is based on purchase price and the estimated economic life of the assets.

Most of these statements are very general and it seems that companies recognise technological change only to the extent that it is incorporated in the data which is used to value the relevant assets. That is, to the extent that the indices and market values incorporate such changes so will the balance sheets and profit and loss accounts of these companies. As Klassen's survey showed the published indices fail to take into account the full effect of changes in technology. It must be concluded that whilst Dutch companies take such changes into account, the reliability and accuracy of the estimates is greater when market values and appraisals are used than when indices are applied. Philips is probably an exception to this. The only other points to emerge from the above replies were that only one company stated the precise effect of changes in technology and one company ignored

technology changes: the latter company unfortunately did not say whether the supplementary depreciation provision took account of such changes. It remains a matter of speculation whether they did.

Another criticism made of RCA in earlier chapters was that it took no account of changes in product-mix. Companies were asked whether the balance sheet values of fixed assets were adjusted to reflect changes in their product-mix. Eight companies said no adjustments were made. Five replies were from Group 1 and one from Group 2: the latter said that such adjustments were not significant. The five replies from Group 1 are summarised below.

1. Fixed assets are related to market segments.

Developments in market segments which affect the value of the related fixed assets are taken into account. The effect depends on the nature of the asset ie whether it is single purpose or multi-purpose. (No further information was supplied as regards the nature of the adjustment: presumably it is effected through the revaluation account).

2. For the last ten years this question has not been relevant. Prior to this its influence had affected replacement values.

3. Account is taken of such changes and adjustments are effected through the revaluation reserve account.

4. No adjustment was made until the affected assets ceased to be used in production.

5. The RV of the fixed assets took full account of changes in product-mix as the RV was calculated on the basis of the most efficient production configuration. No

information was supplied about the mechanics of this adjustment and any other consequential adjustment necessitated by this calculation. As with the first reply, it must be assumed that such adjustments are effected through the revaluation account.

These replies show that some account is taken of changes in product-mix, but with the exception of the fifth reply and possibly the first, the adjustments effected seem to be ad-hoc and lack a coherent theoretical basis. This and the absence of any adjustments by the other companies, highlight the need for further research in this area.

Another criticism which has been made of RCA is that no adjustment is made in the profit and loss account to reflect the debt financed element of the holding gains. As this suggested adjustment has given rise to fierce controversy in the United Kingdom and elsewhere, I thought it appropriate to ask whether the revaluation reserves were ever regarded as distributable.

With one exception, all the other companies thought that such reserves were not distributable. The reasons are set out below.

Group 1 Companies

1. A distribution would diminish shareholders' equity
2. A distribution would raise the problem of how to finance the replacement of equipment.
3. A revaluation reserve is necessary to finance the investment needed to maintain profitability.
4. A distribution would be appropriate if the business intended to discontinue all or part of its activities, otherwise would endanger its continuity.

5. The revaluation reserves are needed to finance replacement investment.
6. This reserve is necessary to finance the increased cost of financing replacement investment.
7. The replacement reserve is built up to safeguard the continuous replacement of fixed assets.
8. The replacement reserve is necessary to enable replacement to be financed.

The same reasons were advanced by companies in Group 2. The exception thought realised fixed asset gains were distributable but made no statement about unrealised profits. The above replies show that companies perceived the revaluation reserves as a non-distributable fund for financing new investment as an alternative to raising the extra finance through a rights issue or by issuing long-term debt. This point was raised with a number of company officials, academics and trade union leaders. All said that in recent years there had been very few rights issues. They said that many companies feared that if they had a rights issue, or floated some long-term debt insufficient funds would be raised. Unfortunately pension funds in Holland, unlike those in the United Kingdom, are only able to invest a very small proportion of their funds in equities and long-term debt. Like the banks in the UK, they lend only on a short-term basis and so it is not possible for companies to finance their long-term capital requirements by borrowing from the banks. It is therefore necessary for companies to retain as much profit as possible in order to finance both replacement investment and expansion. RCA not only reduces reported profits but it highlights to shareholders and trade unions the amount of profit available for distribution,

after taking into account the amount of funds needed to replace the assets consumed during the period. Company officials and others I have talked to perceive that RCA enables them to pay lower dividends than if profits were based on HC principles. They also perceived that the wage demands made by the trade unions were lower. I have spoken to the trade union representatives on the Tripartite Study Group and both expressed the view that RCA gives a better view of the amount of money available for wage demands, expansion and the growth of employment opportunities within the firm. It may be that RCA enables the trade unions to negotiate more beneficial long-term agreements for their members as they are better informed about the company' position. I also raised the question about whether the debt financed part of the holding gain should be treated as part of reported profit. Mr. Neba, one of the trade union members on the Committee referred to above, said that he was aware of the argument, but was against it on the grounds that it might lead to increased wage demands and less money available for expansion.

To get some idea of how important the unions are in these companies they were asked to estimate the degree of unionisation within their company. The replies are summarised in Table 20.

TABLE 20

NUMBER OF COMPANIES	DEGREE OF UNIONISATION (%)
5	30 - 35
1	35 - 40
2	40 - 45
2	45 - 50

This table shows that a significant proportion of the labour force in these companies is unionised. This put the view expressed by management that RCA is likely to lead to lower wage demands into context. If trade union leaders are not given an accurate statement of the company's state of affairs, for instance, by being given the HC accounts, it could lead to wage settlements which had the effect of eroding the company's capital base and to redundancies. This state of affairs would be unacceptable to both parties. Management, because it would not have sufficient funds to finance replacement investment and expansion and the unions because of the employment implications. This explains why RCA is accepted by the trade unions.

However it should be pointed out that the above views are based on discussions I have had with the two trade union members on the Tripartite Study Group. These two people are obviously very important representatives of the trade union movement and undoubtedly represent the unions' position in discussions within the Tripartite Study Group. It is not known whether these views are representative of the union officials involved in negotiations with management. However, doubts arose as a result of an interview with a very senior official of the largest Dutch Shipping Line. He said that there were a number of actual value systems. As stated earlier this term is given to accounting systems based on current values and replacement values in particular. He said that in practice these systems were difficult to use and were mistrusted by the trade unions. HCA was the wrong system but was acceptable to the trade unions because it was simple to understand. This point was discussed with van Bruinessen prior to the

meeting with the official referred to above. He basically agreed with the official's comments and suggested that the reason was because the unions had consulted their colleagues in West Germany, who rejected any system of accounting which departed from HC. From these discussions it appears that the views within the trade unions differ and depend on the level at which discussions take place.

The penultimate and pre-penultimate questions in the interview schedule asked the companies which exchanges they were quoted on and whether it had affected their financial reporting. All the companies were quoted on the Amsterdam Exchange and 5 were quoted on other exchanges. The purpose of these two questions was to ascertain which exchanges these companies were quoted on, in order to form an opinion of the extent to which financial reports of these companies had been influenced by the disclosure requirements of the exchanges on which they were quoted. As most of the companies were quoted only on the Amsterdam Exchange, which has no special disclosure requirements, it seems not unreasonable to suggest that most companies' financial reports were unaffected by their stock exchange quotation. This could have been an important influence as exchanges often have particular disclosure requirements. For instance, companies quoted on the London Exchange have to publish accounts which are in accordance with the Companies Acts. The replies by the companies were divided equally between yes and no. Of the yes replies, 3 were significant. One company said it was difficult to isolate the effect and another replied in similar terms but said that it was the reason why the results on a historic cost basis were published. It could be that the company felt its shares were being marked down because its

performance, based on RC data, was inferior to other companies who published only HC information. The third company said that the wishes of the outside world had been taken into account. It could be that this was the reason why the company published the depreciation provision on both bases and made no adjustment to the cost of sales. Obviously no definite conclusions can be drawn from this reply. However, it is not inconsistent with the view expressed in relation to the second company's share price. Obviously far more research is needed in this area before any definite conclusions can be reached. Consideration of the two questions referred to above completes the analysis of the replies to the questionnaire.

4. CONCLUSIONS

The main conclusions which can be drawn from this survey are set out below.

1. RC data is used by these companies:-
 - i) to evaluate group performance and the performance of individual subsidiaries within the group;
 - ii) in budgets, standard costs and with exceptions, prices.
2. Most companies calculated the RC of their fixed assets by applying indices published by the Dutch Bureau of Statistics. An earlier survey highlighted the weaknesses of these indices and the accuracy of the resulting figures must, at the least, be open to question.
3. The current value of stock was calculated by using market values based on internal estimates.
4. Most companies said they took technological changes

into account in estimating the replacement value and depreciation of their fixed assets. For reasons stated above, whilst the accuracy of resulting figures might be open to question, in practice this was of little consequence as most companies were in industries where there was little change in the underlying technology.

5. Most companies took no account of changes in product-mix in the valuation of their fixed assets and depreciation provisions.
6. Revaluation reserves were not regarded as distributable. Companies stated that if a distribution was made of these reserves they would be unable to fully fund replacement investment.
7. A significant proportion of the employees of these companies were unionised. It was not clear from the replies and interviews whether the unions accepted and based their negotiations on the RC figures.
8. All the companies were quoted on the Amsterdam Exchange. Whilst half the companies stated that this had affected their financial reports it was not possible to generalise about the precise effect as the replies were not sufficiently detailed.

The next chapter will report and review the results of the various statistical tests which have been applied to the financial characteristics of these companies.

R E F E R E N C E S

1. DE BRUIN A N Applied methods of evaluating fixed assets
MAANDBLAD VOOR ACCOUNTANCY EN BEDRIJFSHUISSHOUDKUNDE
(January 1970) p 15
2. KLASSEN J De Verbangingswaarde, Theorie en Toepassing
in de Jaarrekening 1975
ALPHEN AAN DE RIJN, SAMSON UITGEVERIJ
My research was at an advanced stage before the results
of this research were published. The book incorporat-
ing these results is only available in the Dutch language.
3. In five cases no inventories were recorded.
4. ECONOMISCH INSTITUUT DER RIJKSUNIVERTEIT UTRECHT
Vijftig Jaarverslagen-Gewogen en te licht bevonden?
(1975) LEIDEN H E STENFERT KROESE
5. The Dutch refer to Limperg's system as Actual Value
Method Accounting.
That is, assets are shown at RV unless:
$$\begin{array}{l} RV > NRV > EPV \quad \text{or} \\ RV > EPV > NRV \end{array}$$

In both cases the asset would be shown at its NRV. If
Klassen's interpretation of Limperg's theory was
followed the asset would be stated at EPV in the
second case. As we have seen from his survey Dutch
companies do not incorporate EPVs in their accounts
and would resort to NRV in this situation.
6. I am responsible for any translation errors.
7. These modified conclusions which follow have been taken
directly from the Report and translated into English.
I am responsible for any errors that might have
occurred in the translation.
8. NIVRA stands for the Netherlands Institut van Register-
accountants
9. WERKGROEP BESTUDERING JAARVERSLAGEN, ONDERZOEK
JAARVERSTAGEN (1971)
(June 1974) AMSTERDAM NIVRA
A survey based on the 1973-1974 accounting period has
been published subsequently but the results were not
available until some time after my research had started.
I am assured by the Secretariat at the Dutch Institute
that the later survey results were very similar and
differed in only minor respects from the earlier survey.
10. This is reproduced in an Appendix at the end of the thesis
11. The answers have been translated as literally as possible
12. The person who was interviewed is a prominent industrial
member of the Dutch institute.

APPENDIX I

TABEL II Verdergende bedrijfseconomische wensen

(een * verwijst naar de Aansluitingen)

ONDERNEMINGEN

(EXTRACT)

Nr.	Essentie vraag	Nr.	Onderzoeksvragen																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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TABLE II

1. Valuation methods

A AWM Actual Value Methods

- a the balance sheet items as well as the P & L: all relevant items are adjusted on a AWM method (for example: replacement value method)
- b is the replacement value method used and is the Revaluation Reserves Account adjusted for tax
- c is it clear from the notes how the replacement value is derived (are index figures used, which ones) Detailed information.
- d1 supplementary information on annual data on historic cost price - profit
- d2 - depreciation

Combinations (B, C and D)

B Actual Value Method (AWM) only for fixed assets (Partial application of A)

- a balance sheet items and P & L on Actual Value Method
 - b tax adjustment in Revaluation Reserves Account
 - c detailed information
 - d supplementary information on annual data on historic cost price - profit
- Historic cost price but with some usage of Actual Value Method (C and D)

C Actual Value Method items are incorporated in the Accounts

- a balance sheet totally or partially on a historic cost price basis
- a1 total P & L account on Actual Value Method (balance sheet on historic cost price but P & L on Actual Value Method) includes LIFO and Iron Stock methods.
- a2 P & L partially AVM (same as 1Ca1 but only some items are calculated according to the AVM method)
- b balance sheet item: STOCK on AVM
- c an adjustment for inflation but only after calculation of profits following HC rules ie AKZO 1973

D In the notes (as far as adjustments of the balance sheet are concerned)

a fixed assets (replacement value or insurance value)

b stock (same replacement value, or insurance value)

2. A good actual value method is difficult to establish; correction on index basis alone is not sufficient: other problem areas are: technological change, change of market needs and the influence of those on the 'value' of the assets.
The notes should therefore indicate whether the company took these considerations into account.

3. Comparable figures

a a comparison for a period of several years (ratio analysis) at least 5 years

b if a change in valuation method is incorporated are the figures in the ratio analysis adjusted or not

b1 the valuation is incorporated in the previous year's figures

b2 same in case of re-scheduling Annual Accounts

c1 are changes due to consolidation incorporated? Did the accounts indicate how much change was incorporated due to the consolidation

c2 also applicable for past data (1973 eg 1972-1973)

4. Annual Account and profit distribution

a balance sheet after profit distribution

b P & L without profit distribution scheme

5. Means of Production

a buildings of land separate

b initial outlay and accumulated depreciation (how well defined is the depreciation method)

6. R & D expenditure as a percentage of turnover

7. Reservation

- a split for long and short term needs
- b1 how much in reserves for stock and bad debts

8. Schedule for repayment of long or short term debt

	PHILIPS	HEINEKEN	ACF	WESSANEN	MENEBA	NIJVERDAL- TEN CATE	AKZO	KSH	OCÉ	ELSEVIER	NAARDEN	GAMMA	VNU
Balance Sheet													
Property	RV	RV	RV										
Plant & Equipment	✓	✓	✓	Current Cost		Approximately HC				HC			
Land				HC	RV	Valuation							
Buildings				Current Cost	RV	✓				RV			
Assets not used in production				HC	RV	Valuation				HC			
OFA				HC	Cost	Cost				F+F RV			
Inventories of Work in Progress	Lower of RV & NRV	Lower of RV & NRV	Stocks - current purchase prices WIP - direct costs.	Stocks, mainly the lower of cost & m/v FP - as above	Lower of cost & m/v	Mainly lower of cost & m/v Some special provisions made.							
Revaluation Surplus	Differences added net of tax.	Differences added net of tax.	Differences added net of tax.	Differences added net of tax.	Differences added net of tax.	Differences added net of tax.	RM - last known purchase price FP - lower of cost & m/v No account is taken of taxation	RM - Purchase price less any necessary provisions the same policy Differences added net of tax	Special basis but basically cost based Differences added net of tax	Lower of cost or m/v Differences added net of tax	Lower of RC & NRV Differences added net of tax	Special basis for books but basically cost based RM - lower of cost or m/v Differences added net of tax.	
Profit & Loss A/c													
Cost of Sales	RV	RV	RV	Current Cost	RV	FP & WIP - price increase revalued stocks on hand - cost	Change of Policy - non HC but effect stated in notes	Assumption HC		HC	HC	HC	HC
Depreciation	RV	RV	RV	Mainly Current Cost.	RV	Based on balance sheet appraisal value.	Mainly RV	RV		Mainly RV	Mainly RV	Mainly RV	Mainly RV
Taxation	RV	RV	RV	HC	RV	Assumption RV	Assumption RV	RV		Assumption RV	Assumption HC	Assumption HC	HC
Foreign Currency Revaluation Differences attributable to EA	Surplus of that country or deficit if insufficient.	Settled off against revaluations or Pol. if insufficient.	No statement	No statement	Differences on consolidation charged to RR.	No statement	Charged directly to Equity	No statement	Capital Profits/ losses credited/ debited to the Revaluation A/c	No statement	No statement	No statement	No statement
Other Features	<p>Technological changes are taken into account</p> <p>Account is taken of technological changes in determining current cost</p> <p>RR takes into account investments in non-consolidated companies.</p> <p>Accounting policies not detailed enough</p> <p>Supplementary statement based exclusively on current liquidation cost principles</p> <p>This company RVs based on indices</p> <p>Taxation - statement unclear. Tax provision is closer to a RC provision.</p> <p>Taxation provision is well in excess of a provision based on RC</p> <p>Straight line deprec. charged; plant over 10 yrs; buildings 20-30 years.</p> <p>Straight line deprec. various rates stated.</p>												

Key OFA = Other Fixed Assets; M/V = market value; FP = Finished Products; RR = Replacement Reserve; RM = Raw Materials; F+F = Furniture & Fittings

APPENDIX III ACCOUNTING POLICIES FOLLOWED BY GROUP 2 COMPANIES

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	GIST-BROCADES	BUHRMANN-TETTEROE	BALLAST-NEOAM	HOLEC	VMF-STORK	UNILEVER	BOLS	HBG	NUTRICA	KBB	KNPM	NSU
<u>Profit & Loss A/c</u> <u>Additional RV</u> <u>Depreciation</u> <u>provided</u>	YES	YES	YES	YES	YES	YES	YES	YES	A replacement reserve, is identified in reserves This reserve is made up of amounts brought forward together with additional amounts provided from the current year's profits.	YES	YES	NO
<u>Tax Provision</u>	Additional depreciation taken into account	Additional depreciation taken into account.	Assumption - additional depreciation taken into account	No account taken of additional depreciation	Based on HC	Based on HC	Additional depreciation taken into account.	Based on HC	Based on HC	Assumption - based on HC	RC	HC
<u>Other Points</u>				Depreciation charged against profits after tax.	Freely disposable stocks re-valued & an extra charge made in the P&L A/c	Taken into account in the retained profit account		Taken into account in the retained profit account.			Profit & Loss based on RC principles. There is a statement at the end of the year which shows profit on a HC basis.	A separate statement records the effect of inflation on the reported HC profits. This statement precedes the HC accounts.
<u>Balance Sheet</u> <u>Depreciation</u> <u>Reserves</u>	also include some revaluations & devaluations	included in other reserves; the same various other adjustments passed through this account.	credited to account as retained profits.	Separate reserve account in the balance sheet.	gross amount credited; other adjustments also effected through this account.	Retained profits include the fixed asset replacement reserve.	Separate reserve account in the balance sheet.	Separate reserve account.	Separate reserve account.	the additional provision is taken to an account which contains other provisions.	a separate account maintained net of tax, is kept for additional charges in the P&L A/c.	

APPENDIX IV

RATIOS USED BY GROUP 1 COMPANIES

RATIO	1	2	3	4	5	6	7	8	9*
Earnings per share	✓		✓					✓	✓
Tax/Profit	✓								
Retained profit/Net profit	✓								
Dividend per share	✓		✓		✓	✓		✓	✓
Book value/Realised value	✓								
Acquisitions/Depreciation	✓	✓		✓	✓	✓			✓
Stocks/Sales	✓								
Average credit period	✓								
Current assets/Short-term liabilities and provisions	✓	✓				✓			✓
Group funds/Fixed assets		✓						✓	
Price/Earnings				✓				✓	✓
Cash flow/Shares					✓				
Payroll costs/Employees						✓			
Added value/Employees						✓			
Group equity/Liabilities							✓		✓
Interest cover								✓	

* No information supplied, the ratios were extracted from the accounts

In the literature there has been considerable speculation about the effect RCA would have on the published accounts. These usually relate to the effect RCA would have on the following:

- Reported earnings after tax
- Return on shareholders' funds
- Return on capital employed
- Gearing
- Interest and Dividend cover.

There has also been discussion in the literature¹ that RCA more closely approximates a company's economic value than HC. To date only a handful of empirical studies have attempted to resolve these questions. This chapter will focus on the empirical aspects of some of them. As stated in the previous chapter, my analysis is based on the companies included in Groups 1 and 2. Sections 1, 2 and 3 will focus on the effect of RCA on the financial characteristics of these companies. Section 1 will examine the effect of RCA, or some form of RCA, on the reported profits after tax of companies included in Groups 1 and 2 of the survey. Section 2 will examine whether RCA has any effect on the rankings of the various financial ratios which it is thought investors and others use in their investment decisions. Section 3 will test whether the financial ratios of companies included in Group 1 are significantly different from those in Group 2. Section 4 will examine the relationship between RCA and the economic value by using each company's share price as a proxy for economic value. The test will take the form of comparing each company's reported figures for shareholders' funds with its share price on three different dates. Section 5 will review the findings of other statistical

surveys and compare these to my own. Section 6 will briefly review the main findings of this chapter.

1. THE EFFECT OF RCA ON REPORTED PROFITS AFTER TAX

The first part of this section will review the previous empirical studies in this area. This will give my results a frame of reference. As we shall see most of the reported evidence is patchy, unsystematic and reports only the effects of general price level changes. Whilst most of these studies are not strictly comparable they are reported because of the absence of anything else with which to compare my results. The first reported study was by Jones.² He adjusted the accounts of nine US steel companies for the period 1941-47 with the aid of a general price index. Two important differences between the reported data and the adjusted data are reported below.

REPORTED DATA

Dividends covered by a substantial margin each year

Income retained to provide additional capital \$543 m.

ADJUSTED DATA

Dividends not earned in any year since 1941

Dividends, interest and income taxes paid out of capital \$409 m.

In another study³ based on applying a general price index to four companies over the period 1940-1951, he found that:-

- i) the results of one company were typical of the others;
- ii) the increase in gross income over the period was 55% not 187%;
- iii) the return on equity was 4.9% and not over 8%;
- iv) depreciation was 22% higher and that dividends exceeded net income.

Applying similar techniques to a US department store,

Corbin ⁴ found a substantial difference between reported pre-tax earnings and price level adjusted pre-tax earnings. As can be seen from TABLE 1 this error fluctuated considerably from year to year, suggesting that an estimate of it by non-computational means would be hazardous.

TABLE 1

PERCENTAGE EXCESS OF REPORTED EARNINGS OVER PRICE LEVEL

ADJUSTED EARNINGS

<u>1946</u>	<u>1947</u>	<u>1948</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>	<u>1952</u>	<u>1953</u>
0	16	41	7	(14)	28	58	12

In another case study Bell ⁵ examined the effect on the depreciation provision of using current cost data. He showed that during the years 1948, 1949 and 1950 the profits of Armstrong Cork were overstated by 19% in respect of the depreciation provision and the HC depreciation charges accounted for only 50% of current cost depreciation.

In a similar study, but of a farm equipment company, Gordon reported the following results:- ⁶

<u>UNITS \$000</u>	<u>1947</u>	<u>1948</u>
HC operating profits	16.4	27.1
Current cost operating profits	2.0	17.8

This decline was more than offset by the holding gains for both periods: these amounted to \$23800 and \$15900 respectively.

In a study of the accounts of 7 British Steel companies, Baxter ⁷ estimated the effects of applying index adjustments for price changes. This study was similar to the earlier study undertaken by Jones. Whereas Jones examined the effects of only a general index adjustment, Baxter also investigated

the effects of adjusting for specific price changes. He used an index of consumers' expenditure to measure general price level movements and two specialised indices to measure specific price changes. An index of raw material prices prepared by the British Iron and Steel Federation was used to revalue inventories and an index of replacement costs 'industrial assets - steelworks', prepared by the Economists Intelligence Unit was used to revalue fixed assets.

TABLE 2 shows profit on three bases, HC, CPP and RC. The corrected profit calculations do not include the holding gains. This table shows that the difference between the CPP and HC profit fluctuated less than the difference between the HC and RC profit. This implies that the RC profit was considerably smaller than the CPP profit.

These studies were all carried out before 1960 and for nearly a decade no further empirical studies were published. Since then, as inflation has increased so has the number of empirical studies. In the context of this section, the two US studies which will be reviewed below are those by Rosenfield⁸ and the much more systematic study by Davidson, Stickney and Weil.⁹ In the UK the studies have not been as comprehensive as the latter and have been more like Rosenfield's. It is proposed to review these studies in the following order: Rosenfield's first because it was published prior to all the UK studies, the UK studies and then the study by Davidson, Stickney and Weil. This will facilitate the presentation of my results.

Rosenfield's results were based on a field test, sponsored by the Accounting Principles Board, on the financial accounts of 18 companies, these accounts were adjusted by a general price

TABLE 2

ANNUAL PROFITS OF SEVEN BRITISH STEEL COMPANIES

	(1) ACCOUNTING PROFIT (AS REPORTED) £000	(2) CORRECTED PROFIT (GENERAL INDEX) £000	(3) 1-2 %	(4) CORRECTED PROFIT (SPECIFIC INDEX) £000	(5) 1-4 %
1949	19936	17247	13.5	11857	40.5
1950	23183	19569	15.6	20127	13.2
1951	24761	19602	20.8	11699	52.8
1952	34133	28862	16.2	14810	56.6
1953	33960	29846	12.1	32102	5.5
1954	43413	38326	11.7	42094	3.0
1955	56223	50071	10.9	38275	31.9
1956	53948	46066	14.6	33416	38.1
1957	67573	59286	12.3	53253	21.2
Average			14.2		29.2

SOURCE: Adapted from BAXTER W T Inflation and the accounts of steel companies
Accountancy 6(1959) Table 4A

index. The results are summarised below.

GENERAL PRICE-LEVEL ACCOUNTING FIELD TEST

HIGHLIGHTS OF RESULTS

Company	Net income difference* (Column 1)	General price-level gains and (losses) % of restated net income		Effective federal income tax rate		Cash dividends (% of net income)		Rate of return on owners' equity	
		(Column 2)	(Column 3)	Historical (Column 4)	Restated (Column 5)	Historical (Column 6)	Restated (Column 7)	Historical (Column 8)	
A	4%	4%	39%	38%	61%	58%	14.2%	16.7%	
B - 1st year	0%	19%	44%	43%	52%	50%	(not available)		
2nd year	0%	22%	44%	44%	49%	48%	12.0%	13.0%	
C - 1st year	5%	3%	49%	47%	36%	33%	(not available)		
2nd year	14%	5%	50%	47%	50%	44%	13.2%	15.8%	
D - 1st year	233%	(271%)	75%	47%	(no dividends)		(not available)		
2nd year	434%	(542%)	82%	46%			.7%	3.7%	
E - 1st year	(30%)	50%	31%	36%	54%	74%	9.3%	10.2%	
2nd year	(25%)	52%	25%	30%	52%	69%	8.1%	9.7%	
F	10%	3%	(not available)		49%	44%	(not available)		
G	8%	(1%)	12%	11%	66%	61%	12.5%	15.9%	
H - 1st year	20%	(5%)	39%	34%	90%	72%	7.5%	10.3%	
2nd year	18%	(3%)	41%	37%	86%	72%	7.9%	10.5%	
I - 1st year	11%	8%	50%	46%	63%	54%	(not available)		
2nd year	15%	22%	50%	45%	53%	50%	15.1%	18.1%	
J - 1st year	15%	5%	50%	45%	37%	32%	11.4%	13.9%	
2nd year	29%	8%	56%	49%	65%	50%	6.4%	8.8%	
K	12%	7%	41%	33%	49%	43%	12.6%	16.1%	
L	13%	9%	36%	34%	92%	80%	(not available)		
M - 1st year	(10%)	13%	35%	38%	21%	22%	(not available)		
2nd year	(9%)	22%	30%	31%	29%	32%	14.0%	15.0%	
N - 1st year	4%	(7%)	50%	48%	(not available)		(not available)		
2nd year	12%	(7%)	48%	45%	available)		available)		
O	28%	(11%)	57%	50%	78%	60%	(not available)		
P - 1st year	(26%)	49%	31%	36%	48%	52%	(not available)		
2nd year	(31%)	59%	21%	27%	56%	79%	4.9%	5.8%	
Q	(12%)	36%	37%	39%	24%	27%	(not available)		
R - 1st year	21%	20%	52%	45%	37%	29%	(not available)		
2nd year	15%	6%	50%	45%	46%	39%	13.0%	15.6%	

Rosenfield¹¹ concluded from these results that:

'In spite of the modest rate of inflation in the United States in recent years, differences between financial statement amounts before and after restatement were significant for many of the companies. The differences varied

widely from company to company. Net income was a larger amount after restatement than before restatement for some companies and a smaller amount for others.'

Stickney and Green ¹² discovered 'a high degree of association between the two measures of rate of return' reported in the field test, that is, that the ranking ¹³ of enterprises using rates of return was essentially the same before and after restatement to units of general purchasing power. They inferred from this that 'comprehensive restatement may not be necessary ...' But ranking using earnings per share changed dramatically and agreement with Stickney and Green would require ignoring this fact.

Turning to the UK studies, Myddleton ¹⁴ also found a substantial difference between the HC profits and general price index adjusted profits of a public utility - the UK Gas Industry. He found that whereas reported profits aggregated £27 millions over the period 1949-1969, the adjusted accounts revealed losses totalling £377 million. A later study ¹⁵ of all nationalised industries in the UK for the period 1948-1970 disclosed differences of a similar magnitude, as did a study by Pearcy ¹⁶ of the accounts of twelve companies over the period 1959-1968.

Other studies, for instance, Cutler and Westwick ¹⁷ have shown that the impact of inflation adjustments can vary considerably from company to company. TABLE 3 below shows the impact of the adjustments in twenty extreme cases in the study made by Cutler and Westwick.

Studies of the feasibility of accounting for inflation have suggested that the cost of implementing general price level adjustments is not substantial, especially after the first year.

TABLE 3

ADJUSTING ACCOUNTING PROFIT FOR PRICE LEVEL CHANGES

	ACCOUNTING PROFIT PER SHARE (AS REPORTED)	ACCOUNTING PROFIT PER SHARE (ADJUSTED FOR PRICE LEVEL CHANGES)	PERCENTAGE CHANGE IN REPORTED ACCOUNTING PROFIT
Land Securities	5.2	26.6	+414
Metropolitan Estates	7.9	23.4	+195
Commercial Union	12.6	32.5	+158
Sun Alliance	38.1	78.8	+107
Royal	25.6	50.4	+97
St. Martin's Property	3.3	5.7	+73
Guardian Royal	14.2	23.2	+63
Grand Metropolitan	11.0	17.7	+61
General Accident	13.1	21.0	+60
Trust House Forte	10.9	16.8	+54
Tube Investments	25.7	2.6	-90
Johnson Matthey	16.7	0.6	-96
G E C	7.9	0.2	-97
Ocean	7.0	-0.7	-110
Bowater	5.8	-1.0	-117
Babcock & Wilcox	5.1	-0.9	-118
British Leyland	2.9	-1.2	-141
Vickers	6.0	-3.7	-162
P & O	5.1	-4.7	-192
International Computers	3.3	-13.8	-521

SOURCE: CUTLER R S & WESTWICK C A The impact of inflation accounting on the
Stock Market Accountancy 3(1973) Tables 1 and 5 pp 18 - 21

However, in an exercise in the practical application of six methods of accounting for price changes, Hope ¹⁹ identified some difficulties in securing the necessary information. It is not surprising that there are some difficulties in finding appropriate replacement cost data, but Hope ²⁰ also encountered difficulties in obtaining the information on which specific index adjustments could be based in the case of two small public companies. Nevertheless such difficulties do not seem to be decisive.

The last study which will be considered in this section is that by Davidson, Stickney and Weil (DSW). ²¹ They applied general price index adjustments:-

30 companies in the Dow-Jones Index

44 other large companies

12 steel companies

12 pharmaceuticals

6 auto and truck manufacturers

24 public utilities

The results of this study are summarised in TABLE 4 and TABLE 5.

They ²² concluded from their results that:

1. The effects of general price level adjustments differ substantially amongst firms (See TABLE 5)
2. The price level adjusted income before recognising the gain (or loss) on net monetary items is less than conventional net income for nearly all firms and is substantially less for many (see TABLE 4)
3. The price level adjusted net income, after recognising gain or loss on net monetary items, is surprisingly high in relation to HC net income (See TABLE 4)

TABLE 4BASED ON THE MEDIAN

		ADJUSTED INCOME BEFORE GAIN ON MONETARY ITEMS/ REPORTED NET INCOME	ADJUSTED INCOME INCLUDING GAIN ON MONETARY ITEMS/ REPORTED NET INCOME
30	Dow Jones Industrials	63.5	87.0
44	Other	72.0	93.0
12	Steel Companies	71.5	97.5
12	Pharmaceutical Companies	79.0	77.0
6	Auto/Truck Companies	71.0	33.5
24	Public Utilities	65.5	225.5

TABLE 5BASED ON INTERQUARTILE RANGES

30	Dow Jones Industrials	83.0 - 5.0	104.5 - 63.0
44	Other	84.0 - 45.0	116.0 - 81.5
12	Steel Companies	74.0 - 67.0	110.0 - 94.0
12	Pharmaceutical Companies	84.0 - 64.0	83.0 - 61.0
6	Auto/Truck Companies	N/A	N/A
24	Public Utilities	69.0 - 60.0	236.0 - 197.0

This survey of the various empirical studies shows that:-

- i) most surveys have only applied general index adjustments;
- ii) the conclusions of the DSW survey are representative of other general price level adjusted surveys;
- iii) very little work has been done on the effect of RCA on reported profits;
- iv) individual studies of the effect of RCA, or some form of RCA, report substantial differences in the profit figures but take no account of holding gains, which could be substantial;
- v) it is likely that in recent years many companies have been paying dividends out of capital.

MY RESULTS

The effect of RCA, or some form of RCA, on the reported profits after tax of the companies in my survey was calculated on two bases: these are set out below.

1.
$$\frac{\text{HC Profit after HC tax} - \text{RC profit after RC tax}}{\text{HC profit after HC tax}}$$
2.
$$\frac{\text{HC profit after HC tax} - \text{RC profit after HC tax}}{\text{HC profit after HC tax}}$$

The results of these calculations are shown below in TABLES 6 and 7.

As taxation based on RC profits will result in lower tax charges than if based on HC profits, the percentage change in the reported earnings of each company will be greater if HC profits are the basis for taxation, rather than RC profits. The converse will be true if a company is reporting losses. In terms of the effect on reported profits these results are

TABLE 6

GROUP 1

PERCENTAGE CHANGE IN HC PROFITS AFTER TAX	$\frac{\text{HC PROFIT AFTER HC TAX} - \text{RC PROFIT AFTER RC TAX}}{\text{HC PROFIT AFTER HC TAX}}$ NUMBER OF COMPANIES	$\frac{\text{HC PROFIT AFTER HC TAX} - \text{HC PROFIT AFTER HC TAX}}{\text{HC PROFIT AFTER HC TAX}}$ NUMBER OF COMPANIES
> 100	2	3
75 - 100	1	-
50 - 75	-	3
40 - 50	1	-
30 - 40	1	-
20 - 30	2	2
10 - 20	2	1
< 10	4	4
	<hr/> 13 <hr/>	<hr/> 13 <hr/>

TABLE 7

GROUP 2

PERCENTAGE CHANGE IN HC PROFITS AFTER TAX	$\frac{\text{HC PROFIT AFTER HC TAX} - \text{RC PROFIT AFTER RC TAX}}{\text{HC PROFIT AFTER HC TAX}}$ NUMBER OF COMPANIES	$\frac{\text{HC PROFIT AFTER HC TAX} - \text{HC PROFIT AFTER HC TAX}}{\text{HC PROFIT AFTER HC TAX}}$ NUMBER OF COMPANIES
> 100	2	3
75 - 100	1	-
50 - 75	-	1
40 - 50	-	2
30 - 40	-	3
20 - 30	3	2
10 - 20	5	1
< 10	1	-
	<hr/> 12 <hr/>	<hr/> 12 <hr/>

similar to those of DSW. That is, the effect of RCA, or some from of RCA adjustment, differs substantially amongst firms in both groups. Whilst each group is only made up of a small number of companies the distribution of the percentage change in reported after tax earnings is very similar.

In the DSW study the mean and interquartile deviation were calculated for adjusted reported earnings as a percentage of reported earnings. The median, rather than the mean, was calculated by DSW because of the latter's sensitivity to extreme values. For the same reason it was decided to calculate, for each company in both groups, the median and interquartile deviation of RC profit after tax (using both definitions) as a percentage of HC profit after HC tax. The results are summarised in TABLE 8

TABLE 8

	<u>GROUP 1</u>	
	DEFINITION 1	DEFINITION 2
Median	97.0	94.4
Interquartile deviation	163.1 - 85.8	229.0 - 73.5
	<u>GROUP 2</u>	
	DEFINITION 1	DEFINITION 2
Median	78.8	57.5
Interquartile deviation	88.0 - 71.8	76.9 - 45.9

DEFINITION 1 - RC profit after RC tax/HC profit after HC tax

DEFINITION 2 - RC profit after HC tax/HC profit after HC tax

It is apparent from this table that:

- i) the median adjusted RC profit after tax figure as a percentage of HC profit after HC tax of companies in

Group 1 is substantially higher than companies in Group 2;

- ii) the difference, 23% using definition 1 and 64% based on the second definition, is probably more marked because over half the companies in Group 1 have made cost of sales adjustments;
- iii) the interquartile deviation of the adjusted figures as a percentage of the HC figures of companies in Group 1 is substantially greater than that for companies in Group 2;
- iv) it must not be concluded that six companies in Group 1 report higher profits on a RC rather than a HC basis; these figures are distorted by losses: a loss on a RC basis will be greater than on a HC basis but the effect of the two negatives will be cancelled out if any ratio is calculated between the two numbers: in fact only one company showed higher RC profits than HC profits but 4 fell into the loss category: in the DSW study only a few companies reported losses and so this problem did not really arise.
- v) taxation has not distorted these trends: the median and interquartile deviation were calculated for pre-tax RC profits as a percentage of pre-tax HC profits with similar results.

How do these results compare with those of DSW?

1. Companies in Group 1 had a higher median than those in the DSW study if the monetary gain is excluded from the adjusted income figure.

2. DSW argue that public utilities distort the trends of the adjusted figures because they have no equity funding and are mainly financed by loan capital. If public utilities are ignored the median of companies in Group 1 are still higher, with one exception, if monetary items are included.

3. This is not the case for companies included in Group 2. If the first definition of the adjusted figures is compared the median is higher, with one exception, if the monetary gain is excluded, and lower in all but one case if the monetary gain is included. If the comparison is based on the second definition the median in the DSW study, with one exception, is higher in both cases.

4. If the interquartile deviation is compared the deviation is greater, for companies included in Group 1, than for those in the DSW study, even when the monetary gains are taken into account. With two exceptions; one if public utilities are excluded; the deviation (even if monetary items are excluded) of companies included in the DSW study is greater than those included in Group 2 if the comparison is based on the first definition. If monetary gains are excluded, three categories of company in the DSW study have a lower deviation than the Group 2 companies but this trend is exactly reversed if monetary gains are included.

Whilst the two samples are not strictly comparable they are indicative of the effect, to the extent that they are representative of other companies in the populations from which they have been drawn, which general price level accounting in the DSW study, and RCA or some form of RCA in my study, would have on reported profits. The reason for comparing my

results with those of DSW was to facilitate the interpretation of my results. The next section of this chapter will examine whether RCA or some form of RCA has any effect on the rankings of the various ratios investors' are thought to use in their investment appraisals.

2. RCA AND THE EFFECT ON FIVE IMPORTANT FINANCIAL RATIOS

Whilst little is known about the extent and use of ratio analysis by financial analysts and investors in their investment appraisals, it is thought ²² that in evaluating performance the following ratios are amongst the most important:-

1. Return on equity
2. Return on Capital employed
3. Dividend cover
4. Interest cover
5. Gearing

For each company in Group 1 the above ratios were calculated on both a HC and RC basis. As it was not possible to realistically estimate (for reasons stated in the Appendix dealing with the accounting adjustments) capital employed on a RC basis, only the dividend and interest cover could be calculated on both bases for companies in Group 2. Having computed the ratio on both bases for each ratio category (ie return on capital employed etc) a rank, based on relative magnitude, was assigned to each ratio within a particular group. An example will make this point clear. Take for instance, the interest cover. For companies in Group 1 the ratios on both bases are presented in TABLE 9.

TABLE 9

<u>COMPANY</u>	<u>RC</u>	<u>HC</u>
1	1.75	2.2
2	4.27	4.38
3	15.86	17.63
4	2.11	2.62
5	1.56	1.8
6	(1.78)	(1.57)
7	(1.01)	0.12
8	0.28	0.69
9	4.12	4.54
10	5.71	5.84
11	0.37	0.61
12	1.70	2.09
13	4.43	4.48

The rank, on each basis, was assigned by rearranging the figures in order of magnitude.

TABLE 10

<u>COMPANY</u>	<u>RC RANK</u>	<u>COMPANY</u>	<u>HC RANK</u>
3	1	3	1
10	2	10	2
13	3	9	3
2	4	13	4
9	5	2	5
4	6	4	6
1	7	1	7
12	8	12	8
5	9	5	9
11	10	11	10
8	11	8	11
7	12	7	12
6	13	6	13

Each company's rank on both bases was then compared by computing, for each ratio the Spearman Rank Correlation Coefficient. The absolute between the two bases, for each

ratio, was tested by applying the Sign and Wilcoxon Test ²³.

2.1 The Sign Test

The Sign Test is appropriate where, in relation to two related samples, the experimenter wishes to test whether the underlying conditions are different. In my case the two related samples are the two groups of companies and the underlying conditions that I wished to test were whether the rankings were different. The only assumption underlying this test is that the variable under consideration has a continuous distribution. The test does not make any assumptions about the form of the distribution of the differences, nor does it assume that all subjects are drawn from the same population.

For each particular ratio (ie return on equity) the null hypothesis takes the form

H_0 - the median of the differences between the ratios
(on a RC and HC basis) is zero.

The sign test may be either one-tailed or two-tailed. In a one-tailed test, the alternative hypothesis states which sign, plus or minus, will occur more frequently. In a two-tailed test, the alternative hypothesis simply states that the frequencies with which the two signs occur will be significantly different.

It was decided to use a one-tailed test because it was felt that the HC ratios would be greater than the ratios on a RC basis. The alternative hypothesis (H_1) was that the HC ratios would be greater than the RC ratios.

It was decided to test the null hypothesis at the 1% and 5% level. The hypothesis is rejected for all values of x (the number of positive or negative signs which occur less

frequently) which are so extreme that their associated probability of occurrence under H_0 is equal to or less than:

- i) at the 1% level - 0.01
- ii) at the 5% level - 0.05

The power efficiency²⁴ of the Sign Test is about 95% for $N = 6$ but it declines as the size of the sample increases to an eventual (asymptotic) efficiency of 63%.

2.2 The Wilcoxon Matched-Pairs Signed-Ranks Test

The Sign Test utilises information about the direction of the differences between pairs. If the relative magnitude as well as the direction of the differences is considered, a more powerful test can be used. The Wilcoxon Matched-Pairs Signed-Ranks Test gives more weight to a pair which shows a large difference between two ranks than to a pair which shows a small difference.

As with the Sign Test, the null hypothesis for each ratio was

H_0 - the ratio on a RC basis did not differ from that on a HC basis

The alternative hypothesis was

H_1 - the ratios on a HC basis would be greater than on a RC basis.

For the same reasons as were stated above in connection with the sign test,

- i) 1% and 5% significance levels were chosen and
- ii) a one-tailed test was considered appropriate.

The null hypothesis is rejected where the values of T , the rank with the less frequent sign, are so small that the

probability associated with their occurrence under H_0 is equal to or less than

The power efficiency ²⁵ of this test for small samples is nearly 95%.

2.3 The Spearman Rank Correlation Coefficient

This statistic measures the degree of association between two variables that can be ranked, at a minimum, on an ordinal scale. It is calculated by taking for each ratio category, the difference between the rankings for each company and then squaring the differences. The correlation coefficient is calculated by applying the formula

$$r_s = 1 - \frac{\sum_{i=1}^N d_i^2}{N(N^2 - 1)}$$

where d_i = the differences and N = the number of observations.

Testing the significance of r_s

If the subjects whose ranks were used in computing r_s were randomly drawn from some population, the ranks can be used to determine whether the two variables are associated in the population. This enables the null hypothesis, H_0 , that the two are not associated and that they differ from zero only by chance, to be tested. When testing the degree of association the procedures are similar to those followed in the Sign and Wilcoxon Tests. The null hypothesis has already been stated and the alternative hypothesis (H_1) is that the two variables are associated in the population. At the 1% and 5% significance level, the rejection region consists of all values of the measure of association which are so extreme that

the probability associated with their occurrence under H_0 is equal to or less than $\alpha = 0.05$ or 0.01 ; a one-tailed region of rejection is used when the sign of the association is predicted in H_1 . The null hypothesis is only rejected if the value is equal to or less than α . Where N is greater than 4 and less than 30 special tables have been devised for testing the value of r_s . Where r_s is equal to or greater than the value in the table at the level of significance chosen, the observed value is significant at the level indicated.

When N is greater than 10 the significance of r_s under the null hypothesis can also be tested²⁶ by:

$$t = r_s \sqrt{\frac{N - 2}{1 - r_s^2}}$$

Where N is large the value defined by this formula is distributed as student's t with $df = N - 2$. Thus the associated probability under H_0 of any value as extreme as an observed value of r_s may be determined by computing the t associated with that value, and then determining the significance of that t by reference to tables containing values for the Student's t Distribution. In this case, however, the null hypothesis is rejected, at the chosen level of significance, if the calculated value of t is in excess of that shown in the table. It should be pointed out the criteria for accepting or rejecting the null hypothesis is opposite to that for the Sign or Wilcoxon tests.

The efficiency²⁷ of the Spearman rank correlation test when compared with the most powerful parametric correlation, the Pearson r , is about 91%. This means that when r_s is used with a sample to test for the existence of an association in the population, and when the assumptions and requirements

underlying the proper use of the Pearson r are met, ie when the population has a bivariate normal distribution and measurement is in at least an interval scale, then r_s is 91% as efficient as r in rejecting H_0 .

The function of these tests can be summarised as follows:

- i) Sign and Wilcoxon: this tests whether the differences in level, in my case between the adjusted and HC figures, are attributable to scaling or other factors;
- ii) the rank correlation measures the intensity of the relationship between the two sets of figures.

In effect i) and ii) compliment each other. Before examining my results it should be pointed out that there are sample statistics, based on the normal distribution, which perform similar functions to those of the Wilcoxon and Sign Tests. It was decided not to use these tests for the following reasons:-

- i) my sample size was often very small, most samples contained less than 13 observations and some less than 10;
- ii) all the samples were affected by extreme observations;
- iii) all the samples exhibited considerable skewness.²⁸

The results of the various calculations are summarised in TABLE 11.

The analysis of Table 11 will be divided into two sections. The first section will examine the results as they relate to Group 1 and the second section those of Group 2.

Group 1 Companies

1. The Sign and Wilcoxon Tests

Without exception, the null hypothesis, that the median

TABLE 11

<u>GROUP 1 COMPANIES</u>		<u>SIGN TEST</u>	<u>WILCOXON TEST</u>	<u>RANK CORRELATION</u>
		x	T*	r _s
1.	Return on equity (see note 1)	< 0.001	0	0.88
	Critical values	0.01	13	2.72
	t	0.05	-	1.8
				6.09
2.	Return on equity (see note 2)	< 0.001	0	0.88
	Critical values	0.01	13	2.72
	t	0.05	-	1.8
				6.09
3.	Return on equity (see note 3)	< 0.001	0	0.99
	Critical values	0.01	13	2.72
	t	0.05	-	1.8
				23.22
	Return on capital employed	< 0.001	0	0.98
	Critical values	0.01	13	2.72
	t	0.05	-	1.8
				16.25
	Interest cover	< 0.001	0	0.98
	Critical values	0.01	13	2.72
	t	0.05	-	1.8
				16.25
	Dividend cover	< 0.002	0	0.55
	Critical values	0.01	13	3.0
	t	0.05	-	1.9
				1.74

TABLE 11 CONTINUED

<u>GROUP 1 COMPANIES</u>	<u>SIGN TEST</u>	<u>WILCOXON TEST</u>	<u>RANK CORRELATION</u>
	x	T*	r _s
'Gearing'	< 0.001	0	0.94
Critical values	0.01	13	2.76
	0.05	-	1.81
t			8.58
 <u>GROUP 2 COMPANIES</u>			
Dividend cover	0.001	0	0.33
Critical values	0.01	5	2.9
	0.05	-	1.86
t			0.99
Interest cover	< 0.001	0	0.96
Critical values	0.01	10	2.76
	0.05	-	1.81
t			10.73

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- NOTE 1 Return on equity - HC profit after HC tax compared to RC profit after RC tax
 2 Return on equity - HC profit after HC tax compared to RC profit with HC tax
 3 Return on equity - RC profit with HC tax compared to RC profit with RC tax

* Figures not available at the 95% level. The conclusions are not affected as all the values are considerably less than the associated critical value.

of the differences between the two ratios computed on a RC and HC basis was zero, must be rejected at both the 95% and 99% level. A surprising feature of these results is the fact that in no instance was the RC ratio superior to its HC counter-part.

2. Rank Correlation Coefficients

The only ratio not to show a strong association was the dividend cover. This was also confirmed by the relevant t values which indicated that, with the exception of the dividend cover ratio, the null hypothesis of no association must be rejected. In the case of the dividend cover, even though the t value was such that the null hypothesis of no association could not be rejected, the degree of association was quite high and significantly different from zero. The most striking feature of these results are the coefficients for return on equity and capital employed; they indicate a very high degree of association between the rankings of the HC and the RC figures. The smallest of the four coefficients computed for these two ratios was 0.88 and the highest 0.99.

As an indicator of the 'robustness' of these results I varied the assumptions underlying the adjustments in the accounts. For each ratio on the basis of two different assumptions, very similar results to those reported above were obtained.

Group 2 Companies

Although it was only possible to calculate values for two ratios the results are not uninteresting. The null hypothesis underlying the Sign and Wilcoxon tests must be rejected for each ratio at both the 1% and 5% level. The 2 correlation coefficients are similar to their counter-parts in Group 1. The coefficient

for the dividend cover is much smaller but the interest cover correlation is almost perfect.

Having reviewed the statistical content of TABLE 11, the implications of these results will now be discussed. These are summarised below:-

i) the publication of RC or some form of RC information, significantly altered (the interest and dividend covers were exceptions) the absolute level of the financial results thought to be used by investors and analysis in their investment appraisals: this implies that these user groups are unable to estimate the RC figures by applying a scaling factor to the HC figures:

ii) for the companies included in this survey the effect of RCA had little effect on the ranking of the ratios examined: this implies that if the user groups used these ratios in their investment appraisals, the publication of HC rather than RC information, or vice-versa, would have had no effect on their investment decisions;

iii) if this conclusion could be extended to all companies the case for introducing some form of RCA would be greatly weakened;

iv) the findings discussed above in i) and ii) must be interpreted cautiously because of data limitations and some statistical evidence which was at variance with i) above.

3. A COMPARISON OF THE FINANCIAL RATIOS OF COMPANIES
IN GROUP 1 WITH THOSE IN GROUP 2

For reasons mentioned in the accounting appendix it was not possible to make this comparison on both bases. This means that, with the exception of the dividend and interest

cover ratios, the comparison has to be based on the historic cost figures. This increases the data limitations of the survey and must temper any conclusions but such a comparison can be justified on the grounds that it makes the most use of the available data. Undoubtedly this is a strong statistical reason for making this comparison but not the main one. One of the questions this writer wanted to examine was whether the financial characteristics of those companies publishing mainly RC data (Group 1 companies) differed from those companies which published primarily HC data, but made an extra depreciation charge in recognition of increased replacement costs (Group 2 companies). By examining which financial characteristics are different an insight may be given as to why companies in one group have adopted a particular accounting policy or policies. This subject will be discussed in more detail below. It was decided to use the same ratios (but calculated on a different basis) that were used in the previous section and for the reasons outlined in that section. As a result, for each group, the following ratios were calculated

- i) Return on equity
- ii) Return on capital employed
- iii) Gearing
- iv) Interest cover
- v) Dividend cover

As stated above, ratios iv) and v) were also tested on a RC basis.

It was decided to compare the two groups of ratios by testing for differences in the means²⁹ of each ratio. This involved setting up the null hypothesis (H_0) for each ratio that there was no difference between their means. The

The alternative hypothesis (H_1) was that the HC based ratio would be greater than the RC based ratio; this assumption does not seem unreasonable as HC profits are usually greater than RC profits. As the alternative hypothesis predicts which mean is likely to be greater, the test is one-tailed. For small samples, the differences between the means are tested by reference to the Student's t Distribution. This distribution has already been referred to in the previous section, in the paragraph dealing with the significance of the correlation coefficient. The means of each ratio, for each group, were tested by reference to the formulae set out below.

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sigma \sqrt{1/N_1 - 1/N_2}}$$
$$\sigma = \sqrt{\frac{N_1 s_1^2 + N_2 s_2^2}{N_1 + N_2 - 2}}$$

Where \bar{X}_1 = mean of ratio of Group 1

\bar{X}_2 = mean of ratio of Group 2

N_1 = number of observations in Group 1

N_2 = number of observations in Group 2

s_1 = standard deviation of Group 1

s_2 = standard deviation of Group 2

The distribution of t is the Student's t Distribution with $v = N_1 + N_2 - 2$ degrees of freedom. It was decided for the purposes of consistency, to retain the confidence levels used in the previous section ie 95% and 99%. At these levels, where the calculated value of t is greater than that shown in the table for the confidence level selected, the null hypothesis (that there is no difference in the means) cannot be accepted and the alternative hypothesis must be accepted.

The converse is true where the calculated value is less than the value in the tables.

The results are summarised in TABLE 12 which shows that there was no significant difference between the means of each group for four of the ratios: gearing, return on equity, return on capital employed and interest cover. This was also true of the dividend cover on a RC basis but not on a HC basis. This difference could explain why some companies published some form of RCA. The underlying reasoning could be as follows. If these companies published HC data only, those companies with 'high' HC covers might fear that the shareholders would require higher dividends and workers higher wages. Higher payments to these factors of production could prejudice replacement investment and expansion, given the unavailability of alternative funding in the Netherlands. By adopting RCA, or some form of RCA, these companies are able to show similar covers to other companies publishing RC information. This hypothesis could also apply in the opposite situation. A company with 'low' cover might adopt RCA, or some form of RCA, because they are relatively less affected by the increased charges than the other companies who publish some form of RCA. To see whether there was any relationship between the RC information and the cover ratios it was decided to calculate the product-moment and rank correlation coefficient of

Dividend Cover and Extra Replacement Cost Depreciation
Historic Cost Profit

The resulting coefficients were not significantly different from zero and it must be concluded that there was no association between the two variables. By inspection of the data it was not thought appropriate to test the interest cover

TABLE 12

RATIO	BASED ON NOTE:-	t	t ₉₅	t ₉₉	DEGREES OF FREEDOM	ACCEPT - A REJECT - R
'Gearing'	1	1.53	1.73	2.53	20	A
Return on equity	1	1.04	1.71	2.5	23	A
Return on capital employed	1	0.61	1.71	2.5	23	A
Interest cover HC	1	0.02	1.71	2.5	23	A
RC	2	0.65	1.71	2.5	23	A
Dividend cover HC	1	3.58	1.74	2.57	17	R
RC	2	1.3	1.74	2.57	17	A

NOTE 1 The mean HC ratio of Group 1 and the mean HC ratio of Group 2

NOTE 2 The mean RC ratio of Group 1 and the mean RC ratio of Group 2

instead of the dividend cover. As no other evidence could be found for the hypothesis it must be rejected until such time as further evidence is available.

In summary the main conclusions of this section are:-

- i) of the financial characteristics examined, the group means of those characteristics were not significantly different, except in the case of the dividend cover on a HC basis;
- ii) there was no relationship between the dividend cover and the extra RC depreciation charged;
- iii) the above conclusions must be interpreted cautiously, given the statistical limitations imposed by the availability of suitable tests and the data limitations;
- iv) the 'robustness' of the results reported in the previous section is also applicable to these results: as in the previous section the ratios were recomputed on the basis of two different sets of assumptions with similar results.

4. THE RELATIONSHIP BETWEEN RCA AND STOCK MARKET VALUATION

As companies in Group 2 report their fixed assets on mainly a HC basis and it was thought unrealistic to estimate their replacement values, the tests in this section are confined to companies in Group 1. The tests used and the reasons why are described below.

In Section 2, which examined five ratios on two different bases, the Sign and Wilcoxon Tests were used to evaluate whether the differences between the HC and RC figures were

attributable to a scaling factor. For the same reasons these two tests were applied to each company's

- i) stock market valuation on three separate dates, and
- ii) the reported/estimated value of shareholders' funds.

The stock market valuation was compared to shareholders' funds on both bases, and shareholders' funds were compared on both an HC and RC basis. To supplement these tests it was decided to test whether the mean of the differences between these variables differed significantly from zero. This hypothesis was tested by using a paired t test; the reasons for using this test have been explained in reference 29. The degree of association between these variables was measured by calculating the rank correlation coefficient. The null and alternative hypotheses are set out below.

1. Sign Test

The null hypothesis was

H_0 - the median of the difference, for each company, between their shareholders' funds and stock market valuation is zero

H_1 - the median of the difference is not zero.

This hypothesis was tested for both bases (HC and RC) and between shareholders' funds on both HC and RC bases.

A two-tailed test was used because about half the stock market valuation observations were less than the corresponding figure for shareholders' funds and vice-versa. As before the hypotheses were tested at both the 5% and 1% level.

2. The Wilcoxon Test

The null hypothesis was

H_0 - there was no difference, for each company, between

their shareholders' funds and stock market valuation is zero.

The alternative hypothesis was

H_1 - the difference is not zero

For the same reasons as were stated above in connection with the Sign Test, a two-tailed test was used and the significance levels were 1% and 5%.

3. The Rank Correlation Coefficient

The null hypothesis used to test the correlation coefficient was

H_0 - that the shareholders' funds (on both bases and compared to each other) of each company were not associated with their stock market valuation

The alternative hypothesis was

H_1 - that the shareholders' funds (on both bases and compared to each other) of each company are associated with their stock market valuation

In this case a one-tailed test was used as the direction of the alternative hypothesis was predicted. For the same reasons as were discussed above (see 1. and 2) the chosen significance levels were 1% and 5%.

4. The Paired t Test

The null hypothesis was

H_0 - that the mean of the difference, for each company, between their shareholders' funds (on both bases and compared to each other) and stock market valuation is zero.

The alternative hypothesis was

H_1 - the mean of the difference is not zero.

A two-tailed test was used, for the reasons discussed above, but it was only necessary to test the statistic at the 5% level as the results clearly indicated rejection of the null hypothesis.

Each of these hypotheses were tested by reference to the stock market prices on three separate occasions. The first, 31st July 1975, was a random selection: the second was more deliberate, 31st December 1975, this was selected because from this date more and more new information became available to the market, in the form of stockholders' reports and chairman's statements: this adjustment process should have been completed by the third date, 31st March 1976, as most companies would have announced their annual results by this date. As stock-market prices in an efficient market³⁰ react very quickly to new information, the stock market price of each company at this date should reflect the new information in the form of the annual report.

The results of these tests are summarised in TABLE 13. The main features of this table are:

- i) with two exceptions, the Sign Test indicates that the null hypothesis cannot be rejected;
- ii) the more powerful Wilcoxon Test shows similar, but even stronger results: the null hypothesis can only be rejected in one of the two exceptions referred to in i);
- iii) the t test shows that the mean difference between the various combinations is significantly different from zero;
- iv) only one combination, HC and RC shareholders' funds, show a strong correlation;

TABLE 13

DATE		RANK CORRELATION		WILCOXON TEST	SIGN TEST	't' TEST SEE NOTE 1	
31. 7.75	Share price/HC	0.59	T	26			
	Critical values	t_{95}		17	0.05		
		t_{99}	2.20		10	0.01	
		X	3.11			0.13	
		t	2.43				1
Share price/RC	Share price/RC	0.6	T	25			
	Critical values	t_{95}		17	0.05		
		t_{99}	2.20		10	0.01	
		X	3.11			0.13	
		t	2.49				1
31.12.75	Share price/HC	0.62	T	25			
	Critical values	t_{95}		17	0.05		
		t_{99}	2.20		10	0.01	
		X	3.11			0.13	
		t	2.61				1
Share price/RC	Share price/RC	0.61	T	23			
	Critical values	t_{95}		17	0.05		
		t_{99}	2.20		10	0.01	
		X	3.11			0.046	
		t	2.55				1
31. 3.76	Share price/HC	0.58	T	26			
	Critical values	t_{95}		17	0.05		
		t_{99}	2.20		10	0.01	
		X	3.11			0.291	
		t	2.37				1

TABLE 13 CONTINUED

DATE	RANK CORRELATION	WILCOXON TEST	SIGN TEST	't' TEST SEE NOTE 1
31. 3.76 Share price/RC Critical values t_{95} t_{99} x t	0.58 2.23 3.17 2.37	T 21 17 10	0.05 0.01 0.073	1
MISCELLANEOUS				
HC/RC Shareholders' funds Critical values t_{96} t_{99} x t	0.97 2.23 3.17 13.13	T 1 17 10	0.05 0.01 0.002	1

NOTE 1 0 = Not significantly different from zero
 1 = Significantly different from zero

v) the 'robustness' of these results has been tested on the same basis as those reported in the two previous sections.

These results show that there is very little association between a company's shareholders' funds, either on a RC basis or on a HC basis, and the company's stock market valuation. However, there was a very strong degree of association between shareholders' funds when the two bases were correlated. The results of the Wilcoxon test show that any differences in the levels of these figures, with one exception, are attributable to scaling factors. The one exception is shareholders' funds: in this case the difference between the two bases is more fundamental and not attributable to scaling factors. The results of the t test show that since the mean of the differences is not zero, the mean of both variables within a combination must differ. This does not conflict with the Wilcoxon test, as the null hypothesis is consistent with differences to the extent that these arise from scaling factors: the alternative hypothesis is concerned with differences other than those arising from scaling. More importantly the samples forming the basis of the paired t test were skewed and affected by extreme values. As a result, conclusions based on this test must be interpreted with caution.

5. OTHER STATISTICAL SURVEYS

This section will review three surveys which have applied similar statistical methods to those used in the previous section to test data adjusted for price level changes. The first study which will be considered was by Parker³¹ who used a general price index to adjust the accounts of 1050

United States companies for each of three years, 1972, 1973 and 1974. This study is very similar to that of DSW, which was reported earlier. The results of this survey are summarised in TABLE 14 below, which is reproduced from Parker's³² article.

TABLE 14

SUMMARY OF OVERALL IMPACTS OF ADJUSTING
FOR GENERAL PRICE-LEVEL CHANGES

	<i>Ratios Based upon Aggregate Data for 889 Industrial and Retail Firms</i>			<i>Ratios Based upon Aggregate Data for 161 Utility and Transportation Firms</i>			<i>Ratios Based upon Aggregate Data for All 1,050 Firms Combined</i>		
	1972	1973	1974	1972	1973	1974	1972	1973	1974
Ratio of price level net income to historical net income	.765	.802	.867	1.182	1.615	2.065	.835	.913	1.028
Correlation coefficient	.994	.994	.969	.995	.985	.967	.988	.980	.943
Ratio of price level owners' equity to historical owners' equity	1.330	1.373	1.489	1.776	1.913	2.212	1.415	1.477	1.627
Correlation coefficient	.944	.994	.994	.995	.994	.993	.991	.988	.986
Price-level-adjusted rate of return on sales	.041	.049	.046	.133	.170	.193	.050	.059	.059
Historical rate of return on sales	.055	.063	.056	.113	.109	.096	.061	.067	.060
Correlation coefficient	.942	.933	.916	.976	.944	.891	.952	.897	.822
Price-level-adjusted rate of return on owners' equity	.064	.081	.085	.066	.081	.091	.064	.081	.087
Historical rate of return on owners' equity	.112	.140	.148	.099	.096	.096	.110	.131	.138
Correlation coefficient ¹	.931	.927	.860	.920	.873	.782	.930	.912	.831
Price-level-adjusted effective income tax rate	.549	.535	.586	.256	.206	.171	.499	.480	.518
Historical effective income tax rate	.476	.472	.537	.289	.289	.294	.451	.451	.514
Correlation coefficient ²	.729	.769	.630	.964	.925	.869	.805	.835	.738
Price-level adjusted dividend payout rate	.638	.494	.433	.544	.422	.332	.614	.476	.405
Historical dividend payout rate	.477	.383	.356	.641	.662	.669	.506	.424	.399
Correlation coefficient ³	.949	.930	.823	.949	.907	.826	.907	.793	.659

¹ Based upon 888 industrial and retail firms and 160 utility and transportation firms, for which both historical and price-level-adjusted owners' equity were positive for 1972, 1973 and 1974.

² Based upon 720 industrial and retail firms and 130 utility and transportation firms for which each of the following conditions held for 1972, 1973 and 1974: (1) Both historical and price-level-adjusted measures for both pretax income and tax expense were positive; (2) With respect to both historical and price-level-adjusted measurements, tax expense did not exceed pretax income.

³ Based upon 668 industrial and retail firms and 147 utility and transportation firms for which each of the following conditions held for 1972, 1973 and 1974: (1) Both historical and price-level-adjusted measures for both dividends and net income were nonnegative. (2) With respect to both historical and price-level-adjusted measurements, dividends did not exceed net income.

From these results Parker concluded that:-

- i) for the most recent year of the study, 1974, the overall impact of all price level adjustments on aggregate net income was minor;
- ii) the overall impact on asset valuations resulted in considerable adjustment to shareholders' funds and to the rate of return on shareholders' funds;
- iii) the impact on aggregate net income for individual companies and for each major sub-group of firms varied drastically: for 1974 the aggregate restated net income for 899 industrial and retail companies was 13% less than the corresponding HC figure, whilst the aggregate restated net income for 101 utility and transportation companies was more than twice the HC figure.

In terms of the various statistics that were discussed in the previous section this table also shows:-

1. A high degree of association between
 - i) restated price level net income/historical net income:
 - ii) restated price level shareholders' funds/historical shareholders' funds
 - iii) restated price level return on sales/historical return on sales;
 - iv) restated price level dividend payout rate/historical payout rate.

for both industrial and retail firms and utility and transportation firms.

2. A high degree of association for utility and transport forms, between the effective HC tax charge and the restated tax charge.

3. A weaker degree of association, for industrial and retail firms, between the effective HC tax charge and the restated tax charge.

Unfortunately no further statistical work was carried out on this data, which is to be regretted as a large sample of companies was examined. For instance, it would have been a relatively easy task to compute the rank correlation of the companies for each of these years. This would have enabled more powerful results and possibly conclusions to be derived. Parker's results are not surprising as a uniform scaling factor (a general price index) has been applied to the HC accounts. Indeed, it would have been a surprise if high degrees of association were not found. Both Parker's conclusions and my comments on his table add very little to the published empirical evidence considered in Section 1. Parker's main contribution is that he has extended the generality of DSW's findings by working with a larger sample.

The second of the surveys which will be reviewed is also based on general price level adjustments. It differs from the previous survey in that it makes greater use of statistical techniques and so the results are likely to be more indicative of underlying trends. Peterson based his sample on a random selection of the largest 250 companies appearing in May 1970 Fortune's list of the 500 largest companies. With the aid of a specially devised computer program he restated the yearly accounts of 43 companies by applying a general index for each of the years over the period 1960-1969.

Peterson then computed for both sets of data the average and standard deviation of each company's net income and return

TABLE 15

THE SIGN TEST FOR PAIRED COMPARISONS SEQUENTIAL HYPOTHESES

AND RELEVANT r VALUES

NULL HYPOTHESIS	<u>RETURN ON EQUITY</u>		<u>NET INCOME</u>	
	AVERAGE	STANDARD DEVIATION	AVERAGE	STANDARD DEVIATION
0.8 $X_{\beta} = X_{\alpha}$	12	-	-	-
0.9 $X_{\beta} = X_{\alpha}$	8 α	-	-	-
$X_{\beta} = X_{\alpha}$	1 α	5 α	10 α	6 α
1.05 $X_{\beta} = X_{\alpha}$	-	6 α	19	9 α
1.10 $X_{\beta} = X_{\alpha}$	-	9 α	11 α	9 α
1.20 $X_{\beta} = X_{\alpha}$	-	15	6 α	17

α Null Hypothesis rejected with alpha = 0.01

on equity for the above period. He then tested for differences between the data by using the Sign and Wilcoxon Test. The results of the Sign Test are reproduced in TABLE 15 (See page 41 of the article mentioned in Ref. 33).

The numbers in TABLE 15 represent the number of occurrences, positive or negative, that appeared least in the data arrays. Dash entries in the table reflect hypotheses for which only negative or positive signs appeared in the array. At the 1% level a figure in the table equal to or less than 12 would signify rejection of the null hypothesis. From this table he concluded that.³⁴

1. Rates of return on owners' equity computed on a restated historical cost basis are approximately 80% of the same parameter computed on a basic historical cost basis.
2. The standard deviation of rates of return on owners' equity computed on a restated historical cost basis are approximately 120% of the same parameter computed on a basic historical cost basis.
3. The net income values computed on a restated historical cost basis are approximately 105% of the same parameter computed on a basic historical cost basis.
4. The standard deviation of net income values computed on a restated historical cost basis are approximately 120% of the same parameter computed on a basic historical cost basis.

The results of the more powerful Wilcoxon Test are reproduced in TABLE 16 (See ref. 33, p 41)

TABLE 16

WILCOXON TEST RESULTS

<u>HYPOTHESIS</u>	Z_{α}	$\alpha = 0.01$	$\alpha = 0.05$	$P(V \leq v)$
Return on equity	2.127	no	yes	0.0167
Standard deviation of return on equity	2.063	no	yes	0.0195
Net income	1.008	no	no	0.1567
Standard deviation of net income	1.979	no	yes	0.0239

α Normal approximation

TABLE 17

RANK-CORRELATION COEFFICIENTS

<u>PARAMETERS COMPARED</u>	<u>AMOUNT</u>
Return on equity	0.9742
Standard deviation of return on equity	0.7172
Net income	0.9894
Standard deviation of net income	0.8993

From the results of the Wilcoxon Test he was able to conclude that at the 1% level the null hypothesis could not be rejected for any of the measures, but at the 5% level the null hypothesis could be rejected for all the measures, with the exception of the equality of net income hypothesis. The right column of TABLE 16 presents the probability that the value of the test statistic would be equal to or less than the value actually observed if the null hypothesis in each case were true.

Peterson also calculated the rank correlation coefficient for each of these parameters. His results are reproduced in TABLE 17 (see ref. 33, p 42)

It is readily apparent from TABLE 17 that the return on equity and net income measures show a high degree of association between HC figures for these items and their restated counterparts. The weakest association was the standard deviation of the return on equity.

On the basis of TABLE 15 and TABLE 16 Peterson concluded that investors might very well be able to 'adjust' for changes in general price level movements when using published financial information for decision making. As regards the ranking of companies included in his survey, he said that there was no

conclusive evidence that a significant change in the sequential ordering of companies would occur as a result of adjusting the HC accounts by a general index. However, he qualified this by saying ³⁵

'Any reordering is in the explicit sense significant because it suggests that a different investment choice might have occurred as a result of general price level restatements. Certain individual companies in the sample seemed to be affected dramatically by the general price level restatement process. This could suggest that for these companies the adoption of the change in the basic measurement rule for financial reporting to outsiders would have significant ramifications for their ability to command external resources.'

Peterson added that his results should be interpreted cautiously as his sample was not random and an estimation procedure was used to adjust the accounts of the companies included in his survey.

It is not surprising that Peterson found a strong relationship between the HC and restated figures for the same reason as was stated in connection with the correlation coefficients' calculated by Parker: that is, a uniform scaling factor (a general price index) has been applied to the HC figures. As was also stated earlier, it would have been surprising if this relationship was not present. However Peterson's main contribution is that he has suggested statistical techniques, the Wilcoxon Test and Rank Correlation Coefficient in particular, that might be used to test data adjusted by specific, rather than general indices. Indeed,

Peterson's work formed the basis of my statistical work and the use of statistical analysis in this area has been extended by Kratchman, Malcolm and Twark³⁶ (hereinafter referred to as KM&T), which is the third and last study which will be reviewed in this section.

These authors focused their attention on all the companies within a single industry grouping - real estate investment trusts. Four bases of accounting were selected for this research:

Historical cost

Historical cost - restated for changes in the
general price level

Current value - not restated for changes in the
general price level

Current value - restated for changes in the
general price level.

The effects of using these alternative income concepts were studied by analysing rankings of performance based upon each method. The performance measures selected to provide a basis for ranking the firms were Net Income/Total Assets and Net Income/Owners' Equity. The null hypothesis was that there are differences (ie little or no correlation) among the rankings of the above performance measures using the four methods of income stated above. The null hypothesis was tested in two phases. In the first, all the valuation methods were correlated simultaneously. In the second, selected pairs of the income methods were correlated.

For the first phase of testing Kendall's Coefficient of Concordance (Kendall's W) was applied to the rankings. Kendall's W is similar to the multiple linear correlation

R which is often used to measure the degree of association among three or more quantitative variables. Possible values for the coefficient range from zero to one. Strong negative relationships as well as little or no agreement among k treatments (the four statement valuation methods) would result in low values for Kendall's W whereas the converse would result in high R values.

In the second phase of testing, each of the four basic income concepts was compared individually with each of the others. The more familiar Spearman Rank Correlation Coefficient (Spearman's Rho) was used for this analysis.

The results of applying Kendall's W to the rankings of performance measures are summarised in TABLE 18. These results show that there was considerable agreement in the rankings of the companies under the four valuation bases (basis 2, Historical Cost - restated for general price level changes was compared to the other bases, both before and after taking into account purchasing power gains.)

In each case, a test of the null hypothesis of no agreement produced a rejection of the hypothesis at a significance level of at least 0.001. The degree of agreement was less than perfect and the correlation coefficients for the performance measure Net Income/Owners' Equity was substantially lower than for those for Net Income/Total Assets.

The results of the second phase of testing are shown in TABLE 19. For Net Income/Total Assets, all the correlation coefficients are statistically significant at the 0.001 level or smaller. Whilst this indicates agreement in the rankings

TABLE 18

KENDALL'S COEFFICIENT OF CONCORDANCE, W

<u>PERFORMANCE MEASURE</u>	<u>KENDALL'S W^α</u>
1. Net income/Total assets	
Price-level adjusted historical cost	
Before purchasing power gain or loss	0.903
After purchasing power gain or loss	0.905
2. Net income/Owners' equity	
Price-level adjusted historical cost	
Before purchasing power gain or loss	0.668
After purchasing power gain or loss	0.759

^α Statistically significant at the 0.001 level using the Chi-squared approximation. $\chi^2 = k(n-1)W$, where $k = 4$ income concept methods and $n = 23$ companies. Tests were performed twice, with price level adjusted income defined per share.

TABLE 19

SPEARMAN'S RHO APPLIED TO THE RANKINGS OF 23 COMPANIES'
PERFORMANCE OBTAINED UNDER SELECTED INCOME CONCEPTS

INCOME CONCEPT METHODS CORRELATED	MEASURE (1) CORRELATION COEFFICIENTS ^α	MEASURE (2) CORRELATION COEFFICIENTS ^α
1. Historical cost with price-level adjusted historical cost before purchasing power gain or loss	0.973***	0.916***
2. Historical cost with price-level adjusted historical cost after purchasing power gain or loss	0.893***	0.724***
3. Historical cost with current value	0.898***	0.433***
4. Historical cost with price-level adjusted current value	0.782***	0.332
5. Current value with price-level adjusted historical cost before purchasing power gain or loss	0.862***	0.382*
6. Current value with price-level adjusted historical cost after purchasing power gain or loss	0.926***	0.841***
7. Price-level adjusted current value with price-level adjusted historical cost before purchasing power gain or loss	0.793***	0.317
8. Price-level adjusted current value with price-level adjusted adjusted historical cost after purchasing power gain or loss	0.824***	0.777***
9. Current value with price-level adjusted current value	0.913***	0.966***

Statistically significant at the:- * .05, ** .025, *** .001 levels
^α Measure (1) is Net income/Total Assets. Measure (2) is Net income/Owners' equity

the degree of agreement varied, as evidenced from coefficients which ranged from 0.782 to 0.973. For Net Income/Owners Equity three of the pairs produced rank correlation coefficients which are considered to be either moderate, or weak, with pairs 4 and 7 having coefficients of only 0.322 and 0.317. When tested further, these coefficients were found to be statistically significant only at the 0.10 level. The authors point out that the four pairs which can be considered weak consist of some historical cost method matched with some current value method.

From this analysis the authors concluded that.

1. There was overall agreement between the four methods for the two ratios considered; this implies that each income concept could be used as a surrogate for the others.

2. For net income/owners equity the overall agreement among the income concepts was less than that for Net Income/Total Assets: this means that more caution would be warranted in the former case in using one income concept as a surrogate for another, than in the latter.

3. For individual comparisons the correlation coefficients for Net Income/Total Assets varied from 0.782 to 0.973 and taken together with Kendall's W, support the inference, that for this ratio, any one income concept is highly associated with the other.

4. For Net Income/Owners Equity, the range of correlation coefficients was greater (0.317 to 0.966).

5. Four of the coefficients showed a weak degree of association and significantly all four were comparisons of a HC method with a current value method.

6. For the special case of historical cost and historical cost adjusted for general price levels, very strong relationships were found for both Net Income/Total Assets and Net Income/Owners' Equity; coefficients were above 0.9 if purchasing power gains or losses were not considered. The coefficients dropped if purchasing power gains or losses were excluded. However, the conclusion of Peterson that 'investors might very well be able to 'adjust' for general price-level movements when using published financial information for decision making' seems justified. 37

To the extent that the return on capital employed (my figure) can be thought of as a proxy for the net income/total assets ratio my results are similar to those just described. They differ as regards the return on shareholders' funds, or in K, M and T terms, the net income/owners' equity ratio. Whereas my results indicated a strong association between the two bases, RV and HC, the results of K, M and T indicated a much weaker relationship. My figures (for the three bases) were 0.97, 0.87 and 0.97, whilst the corresponding figure for K, M and T (historical cost with current value) was only 0.433.

As stated earlier in connection with the other two studies examined in this section, the high correlations found between the HC figures and restated figures was to be expected. However, what was novel in their approach was the high degree of overall agreement they found between the various income measures and this approach provides a useful

basis for further research in this area. Whilst their novel approach is innovative and commendable their study has been criticised on theoretical, methodological and statistical grounds by Picur and McKeown. These authors cast doubts on the results of K, M and T by adjusting one company's figures for some of the methodological defects; substantial differences were found between their figures and those of K, M and T. In view of the controversy and specialised nature of the industry they examined the most that can be said of this study is that it adds to the stock of empirical evidence and suggests how the 'coefficient of concordance' (Kensall's) might be used in subsequent empirical studies.

6. CONCLUSIONS

Previous empirical studies had shown that the effect of price level changes varied substantially amongst companies. This was also found to be true of companies included in my survey. It was found that the median difference between the RC and HC profits was greater in the case of companies only partially adopting RCA (Group 2) than for companies who published more comprehensive RCA data (Group 1). The median difference between the reported HC and RC figures for profits was less than 10% for companies in the latter group (Group 1) but substantially more (greater than 20%) in the case of companies in the second group.

Significant differences were found between the HC and RC figures for all the ratios examined, although there was some statistical evidence to the contrary. A high rank correlation coefficient was found between the HC and RC

rankings for four ratios in Group 1 and interest cover in Group 2; this implies that if investors decisions are based on rankings and if this finding could be generalised, RCA would have little effect on investors' decisions. Dividends were the exception in both groups.

A comparison between the groups of the ratios on a HC basis showed no significant difference for 'gearing', return on capital employed, interest cover and return on equity. This was also true in the case of the dividend cover on a RC basis but not on a HC basis. No conclusive evidence could be found, from the annual reports or otherwise, to explain this difference.

The last relationship to be examined was between each company's share price (as a proxy for economic value) on three different dates and shareholders funds. In all but one case, HC/RC, the null hypothesis of no difference between the various combinations could not be rejected. It was also found that the mean of the difference between each company's share price and shareholders' funds, for both valuation bases and for each date, was significantly different from zero. This finding did not necessarily conflict with the finding that there was no difference between a company's price and its shareholders' funds: this is because the particular test that gave this result took no account of scaling differences and the samples were affected by skewness and extreme values. The only strong correlation found between the various combinations was between HC and RC shareholders' funds. This implies that (for companies included in my survey) adjusting the accounts made very little difference to their sequential ordering on both bases.

Two of the statistical studies which were reviewed showed similar findings. The strong association between the HC and the restated figures was to be expected as a uniform scaling factor was applied to the HC figures. The third study made a similar finding in respect of the HC and restated figures, but not between the HC and current value figures. The weak association between the two figures conflicted with my results. However, it is not possible to make a valid comparison between the two studies as both studies have statistical and other limitations.

In the next chapter the main findings of this thesis will be discussed. The emphasis of this discussion will be on the survey results and the implications of these results for subsequent empirical research in this area.

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ratios was tested by using the Students paired 't' test
the results conflicted with those of the Sign and
Wilcoxon test. The paired 't' test assumes that the
sample is distributed normally; in each case the sample
was not distributed normally and so this result was not
unexpected.
29. This test was used rather than the 'paired' t test: the
latter is applicable where one sample has been taken
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RETURN ON EQUITY

PHILIPS WENKEL ACE WESSAN MENEBB
EN

NISSA TRIGATE AKZO KSH OCÉ ELSENER LABROD GAMMA VNU

HC Profit with HC Tax
Rank

5 01 10 22 10 63 12 11 10 62
8 6 4 2 5

(1999) (548) (219) (219) 11 01 20 13 (021) 4 51 7 39
13 12 11 10 3 9 1 10 9 7

RC Profit with RC Tax
Rank

2 17 8 71 8 57 5 33 6 51
9 3 4 7 6

(2038) (955) (422) (422) 9 09 18 09 (098) 3 42 6 76
13 12 11 10 2 1 10 8 5

RC Profit with HC Tax
Rank

0 27 8 44 7 65 4 45 4 38
9 2 4 6 7

(2121) (1390) (643) (643) 8 05 17 69 (172) 2 44 6 68
13 12 11 10 3 1 10 8 5

GEARING

HC Rank

3532 2861 -- 5043 5916
8 11 3 1

39 1 39 61 56 8 34 - 38 77 40 56 19 8 30 57
6 5 2 9 7 4 4 12 10

RC Rank

3061 2383 - 4276 5157
8 11 3 2

36 82 33 62 51 93 30 29 36 - 34 28 18 6 25 65
4 7 1 9 5 6 6 12 10

INTEREST COVER

HC Profit before Tax

1048 9 125 99 2528 3899 2040
870 7 27 33 152 24 - 25 55

(2861) (23884) (949) 49 58 30 80 (279) 7 64 28 91
11 15 270 20 30 38 14 - 63 6 722 7 01 831

Interest Total

1919 6 163 32 2680 6299 4595
220 4 38 17 63 2 62 1 80
7 5 6 9

(1746) 31 36 20 91 63 58 37 16 44 3 14 65 37 22
(157) 0 12 12 10 4 54 5 84 0 61 2 09 4 48

Cover

651 - 122 03 2258 2663 1423
870 70 27 33 152 24 - 25 55

(3104) (4384) (2191) 43 68 29 96 (453) 4 89 28 47
11 15 270 20 30 38 14 - 63 6 722 7 01 831

RC Profit before Tax

1521 70 159 36 2410 5063 3978
175 4 27 15 86 2 11 1 56
7 4 4 6 9

(1989) (2734) 8 41 57 68 36 32 2 69 11 90 36 78
(178) (101) 12 11 5 4 12 5 71 0 37 1 70 4 43

Interest Total

425 4 64 95 1348 2076 1228
238 3 24 9 4 62 6 13 4 64
179 2 61 2 92 5 71 2 65
9 7 3 6

27 5 60 99 10 78 10 40 6 11
238 3 24 90 4 62 6 13 4 64

Cover

012 9 24 5 245 233 17 8
9 3 4 7 8

273 273 648 1769 273 648 214 211 5 6
2 2 2 2 2 2 2 2 2 2

DIVIDEND COVER (based on

HC Income as on Falle for ICS shareholders)

Dividend Cover Rank

425 4 64 95 1348 2076 1228
238 3 24 9 4 62 6 13 4 64
179 2 61 2 92 5 71 2 65
9 7 3 6

27 5 60 99 10 78 10 40 6 11
238 3 24 90 4 62 6 13 4 64

RC Income available for shareholders

Dividend Cover Rank

012 9 24 5 245 233 17 8
9 3 4 7 8

273 273 648 1769 273 648 214 211 5 6
2 2 2 2 2 2 2 2 2 2

GROUP 1 COMPANIES

	PHILIPS HENKEL ACF	WESSAN EN MENTEBA	NITKORON TEN CATE AKZO	KSH	OCÉ	ELSKYER NARODEN GAMMA VNU
<u>TOTAL COST</u>	1919 6 16332 26 8 6299 11595	(1746) 3136 2091 6358 3716 443 1954 3722	30214757807 63434 45075 19028 17649 207 9 38359			
Capital Employed	95 1567 1774 2 4 1533 1357	5 8 3 2 4 4 6	13 12 10 3 3 14 11 1953 253 9 4 9 70			
CF ank						
<u>PLACEMENT COST [Inc Tax]</u>	1521 7 15936 241 5063 3978	(1989) (21364) 841 5768 3632 269 11 90 3678	32087 892849 69378 50592 20492 20883 221 33 454 19			
Capital Employed	23322 2 125164 197 2 48474 38846	652 1273 1222 1044 1024	(620) (306) 121 11 4 1772 129 538 8 1			
CF ank	8 2 3 5 6	13 12 10 4 7				

APPENDIX II

GROUP 2 COMPANIES

	GIST-BRO CADES	BURKHARDT FETTERODE	BALLAST NEDAN	HOLECO	IMP STORK	UNILEVER	SOLC	HBO	MITTICIDA	KBE	ICP
HC Shareholders Funds	270.59	297.20	118.01	205.35	333.24	4362	149.99	251.10	73.92	179.58	242.14
RC Income av. for SE after HC tax	9.58	30.65	5.33	(4.74)	31.57	172.00	15.09	14.21	4.17	11.78	(24.72) (
RC Income av. for SH after RC tax	15.00	35.08	7.28	(1.78)	41.02	244.00	16.01	17.39	5.38	13.24	(10.26)
HC Income av. for SH after HC tax	20.89	39.88	9.40	1.43	51.25	322.00	17.17	21.88	6.70	14.82	3.72 1
Extra depreciation	11.31	9.23	4.07	6.17	19.68	150.00	2.08	7.67	2.53	3.04	29.0- 1
Return on Equity (HC)	7.72	13.42	7.97	0.70	15.38	7.38	11.45	8.71	9.06	8.39	1.53
Gearing (HC)	29.97	31.13	43.77	5.68	41.79	27.62	15.60	31.05	40.56	63.94	9.96
HC Capital Employed	471.95	519.81	240.39	284.33	575.34	7906	215.04	471.96	177.13	284.40	393.33
Long Term Debt	141.45	161.83	105.21	16.16	240.42	2184	33.54	146.55	71.85	444.76	39.19
RC Income before Inter- est and tax	38.15	89.69	16.02	1.03	75.33	818	35.38	43.87	24.76	42.62	(19.97) (
HC Income before Inter- est and tax	49.45	98.92	20.09	7.19	95.01	968	37.46	51.54	27.28	45.68	8.07 1
RC Income before tax	24.49	60.64	9.28	(2.42)	49.07	581	30.18	28.37	10.66	19.88	(25.62) (
HC Tax	14.91	29.74	3.95	2.32	17.50	377	15.09	14.07	6.49	7.80	14.76
RC Income after HC tax	9.58	30.90	5.33	(4.74)	31.57	204	15.09	14.30	4.17	12.08	(10.86) (
Minorities		0.25				32		0.09		0.30	
RCE (HC)	10.48	19.03	8.36	2.53	16.51	12.24	17.42	10.92	15.40	16.06	2.05
<u>DIVIDEND COVER - Tax HC</u>											
RC Income av. for SH	9.58	30.65	5.33	(4.74)	31.57	172.00	15.09	14.21	4.17	11.78	- - (
Dividend	7.90	16.74	2.98	- -	12.48	245.00	8.38	8.23	3.28	7.17	- -
Cover	1.21	1.83	1.79	- -	2.53	0.70	1.80	1.73	1.27	1.64	- -
Rank	8	2	4		1	9	3	5	7	6	
HC Income av. for SH	20.89	39.88	9.40	1.43	51.25	322.00	17.17	21.88	6.70	14.82	- - 1
Dividend	7.90	16.74	2.98	- -	12.48	245.00	8.38	8.23	3.28	7.17	- -
Cover	2.64	2.38	3.15	- -	4.11	1.31	2.05	2.66	2.04	2.07	- -
Rank	5	6	2		1	10	8	4	9	7	
<u>INTEREST COVER</u>											
RC Income before Interest and tax	38.15	89.69	16.02	1.03	75.33	818	35.38	43.87	24.76	42.62	(19.97) (
Interest	13.66	29.05	6.74	3.45	26.26	237	5.20	15.50	14.10	22.74	5.65
Cover	2.79	3.09	2.38	0.30	2.87	3.45	6.80	2.83	1.76	1.87	(3.53)
Rank	6	3	7	10	4	2	1	5	9	8	12
HC Income before inter- est and tax	49.45	98.92	20.09	7.19	95.01	968	37.46	51.54	27.28	45.68	8.07 1
Interest	13.66	29.05	6.74	3.45	26.26	237	5.20	15.50	14.10	22.74	5.65
Cover	3.61	3.41	2.98	2.08	3.62	4.08	7.20	3.30	1.93	2.01	1.43
Rank	5	6	8	9	4	3	1	7	11	10	12
HC Profit	35.79	69.87	13.35	3.74	68.75	731	32.26	36.04	13.18	22.94	2.42

10

C O N C L U S I O N S

1. The Literature Review
2. The Empirical Results
3. Future Research

APPENDIX I The Questionnaire

II An Analysis of the
Data Adjustments

The main conclusions of this thesis fall into three categories. These relate to

1. The literature review
2. The empirical results
3. Future Research

1. THE LITERATURE REVIEW

It was clear from this review that the only two systems of accounting acceptable to the business community, of which I obviously include practising accountants, were either RCA or CPP or some hybrid of these two systems. This being the case it must be recognised that both these systems (including the hybrid) rely on allocations. By this is meant the assignment of a total to one or more categories, such as the writing-off of a fixed asset over a period of time, usually its estimated life. It is likely that no two managers' estimates of the life of a particular asset will be the same. This problem is further exacerbated by the various depreciation policies that could be applied. Although accountants have long realised that many of their problems involve how to allocate and that allocations have at least an element of arbitrariness in them, it is only recently that an argument has been offered which purports to demonstrate that allocation is a fallacy which destroys the usefulness of the information.¹

The implication of this analysis is that the determination of income is a pointless exercise² and may recede as a goal of financial accounting in the future. At the moment virtually no accounting practitioner and only a few academics can conceive of such a development. It does, however, highlight the need for these problems to be thoroughly researched in order to arrive at a satisfactory solution

Whilst the allocation problem is common to all accounting systems based on input prices it was found that both CPP and RCA have a number of advantages and disadvantages. However, RCA or some form of RCA had found favour with three government sponsored committees. This implies that in three countries it is likely that in the near future most companies will have to publish some form of RC information. The chapter dealing with RCA indicated that the system had no satisfactory answer to the problems of technological change and the dichotomy between operating profits and holding gains where the firm actively speculated in price changes. The former problem was also found to exist in the Dutch theoretical literature on RCA. Given the imminence with which some form of RCA is likely to be introduced (ED24 in the UK) it is of some urgency that further research is carried out in this area. The latter problem is more tractable. The Dutch 'normal stock' concept, whilst not entirely satisfactory, would reduce some of the distortions caused by the rigid dichotomy between COP and holding gains. The concept can also be applied to the problem of 'back-log' depreciation, a problem that has received very little attention in the English speaking literature. The other unresolved problem area is where a company changes its product mix: to date no satisfactory solution has been formulated and further research is obviously required.

2. THE EMPIRICAL RESULTS

In relation to the questionnaire it was found that RCA was used to evaluate both group and divisional performance: and in most cases was incorporated in the budgets, standard costs and prices. However, it was also found that whilst this information

might be of a higher quality than HC information, much of the advantage might have been lost because of the inaccuracies and unreliability of the indices used to estimate replacement values. This suggests that further research should be carried out in the UK into the various indices available in order to ascertain their accuracy and to suggest improvements where necessary. The survey also showed that, to some extent, RC profits were used by management as a yardstick for assessing dividends. The findings for wage negotiations were more ambiguous. Overall, most of the assertions in the Sandilands Report as regards the use made of RC information were borne out by the companies included in the survey. The survey results in relation to technological change were not helpful and reinforce the conclusion reached in the theoretical section to the effect that further research was needed.

The statistical results showed that, with the exception of the dividend cover, there was a high degree of rank correlation between the two systems for the ratios that were tested. However, the results of the Wilcoxon Test showed that there were differences between the figures which could not be accounted for by scaling factors. This suggests that decisions based on rankings would not be very different under both systems of accounting but that this conclusion might not be true if decisions were based on the reported figures. The significant finding was the absence of any relationship between the shareholders' funds of each company, on both bases, and the stock market price of each company on three separate occasions.

3. FUTURE RESEARCH

The empirical research discussed in the previous section is part of a larger project now being pursued by this writer with the aid of a large SSRC grant. On the basis of a large sample of companies in the United Kingdom it is proposed to replicate and extend the empirical work described above by examining:-

- i) the use these companies make of the RC numbers;
- ii) the relationship between the rankings of the ratios computed in this survey;
- iii) the relationship, on a time-series basis, between the standard deviation of HC and RC earnings for each company;
- iv) the relationship between a company's share price and the reported RC figures for shareholders' funds;
- v) the extent to which depreciation policies changed when RCA was introduced.

On the basis of a smaller and possibly industry-based survey the impact of:-

- i) technological changes on the reporting of fixed assets;
- ii) foreign operations and how the RC numbers are generated; a subject not covered in my Dutch survey.

It is hoped that the results of this survey will considerably extend the rather modest findings of the Dutch survey. However the findings of the Dutch survey should not be dismissed too lightly as they form the basis for subsequent research work.

R E F E R E N C E S

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VRAGENLIJST

Beantwoord alleen die vragen welke van toepassing zijn op Uw bedrijf.
 Doorhalen wat niet van toepassing is.

1. Waarom werd "Vervangingswaarde Accounting (VWA)" geïntroduceerd?
- (a) Dividend uitkeringen ja/nee
 - (b) Salaris onderhandelingen ja/nee
 - (c) Prijs bepaling ja/nee
 - (d) Andere reden(en) ja/nee

Indien -(d)-, gaarne specificatie:

.....

.....

2. Wanneer werd VWA bij U geïntroduceerd?

3. Wordt VWA gehanteerd in de voortgangsbeoordeling voor de groep als geheel? ja/nee

Indien -ja-, in welke kerngetallen?

- (a) Return op Werkzaam vermogen ja/nee
- (b) Return op Eigen Vermogen ja/nee
- (c) Winst als % van de Omzet ja/nee
- (d) Vreemd vermogen als % van Werkzaam Vermogen ja/nee
- (e) Andere kerngetallen: ja/nee
-
-

Geef hieronder duidelijke definities van de kerngetallen zoals ze in Uw bedrijf gehanteerd worden. (B.v. Werkzaam Vermogen = totale Aktiva minus vreemd kort vermogen (zonder inachtneming van kort lopende bankkredieten):

.....

.....

.....

.....

.....

4. Wordt VWA gehanteerd in de voortgangsbeoordeling van de individuele bedrijven binnen Uw groep? ja/nee

Indien -ja-; via welke kerngetallen?

- (a) Return op Werkzaam Vermogen ja/nee
- (b) Return op Eigen Vermogen ja/nee
- (c) Winst als % van de Omzet ja/nee
- (d) Lang vreemd Vermogen als % van Werkzaam Vermogen ja/nee
- (e) Andere kerngetallen ja/nee
-
-

Geef, ook hier, duidelijke definities van de gebruikte kerngetallen:
.....
.....
.....
.....
.....

5. Wordt VWA gebruikt in:

- (a) Budgettering ja/nee
- (b) Standaard kost systemen en variantie analyse ja/nee
- (c) Prijs bepaling ja/nee

6. In de beoordeling van "prijs variantie", hoe worden de prijsverschillen, veroorzaakt door stijgingen van inkoopsprijzen, verwerkt en geanalyseerd?

.....
.....
.....
.....
.....
.....

7. Op welke basis worden huidige waarden bepaald?

	index	marktwaarde	ander
(a) Voorraden	.	.	.
(b) Vaste Aktiva	.	.	.
terreinen en gebouwen	.	.	.
machines en installaties	.	.	.

8. Indien - andere basis- gehanteerd wordt, gaarne definitie:.....
.....
.....

9. Indien -indices- gebruikt worden, zijn deze intern ontwikkeld, of gebruikt U externe informatiebronnen?

- (a) interne informatie ja/nee
- (b) externe informatie t. w. :..... ja/nee

10. Indien -marktwaarden- gebruikt worden, zijn deze vastgesteld door onafhankelijke of door interne taxateurs?

- (a) interne ja/nee
- (b) externe ja/nee

11. Bevindt Uw bedrijf zich in een industrietak met:
- | | |
|--------------------|---------|
| (a) snelle groei | ja/neen |
| (b) langzame groei | ja/neen |
| (c) geen groei | ja/neen |
| (d) teruggang | ja/neen |

Indien (a) t/m (d) niet van toepassing zijn, gaarne de reden:.....
.....
.....
.....

12. Hoe worden veranderingen in de gebruikte techniek behandeld in het Jaarverslag. (nadruk op de vervangingskosten voor nieuwe machines wegens veranderingen in de gebruikte techniek en de afschrijvingsmethodiek van de bestaande machines)?.....
.....
.....
.....
.....
.....
.....

13. Worden de waarden voor de Vaste Aktiva in de Balans aangepast voor wijzigingen in de product-mix? ja/neen

Indien het antwoord is -ja-, gaarne indicatie van gehanteerde methodiek:.....
.....
.....
.....
.....

14. Ziet U de "Reserve Herwaardering" als voor verdeling vatbaar? ja/neen

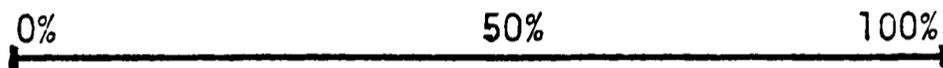
Indien het antwoord is -neen-, gaarne de reden:.....
.....
.....
.....

15. Op welke effectenbeurzen staat Uw bedrijf genoteerd?
- | | |
|------------------|--------|
| (a) Amsterdam | ja/nee |
| (b) London | ja/nee |
| (c) New York | ja/nee |
| (d) Andere:..... | ja/nee |

16. Heeft de notatie op de effectenbeurs invloed gehad op Uw huidige financiële rapportage systeem? ja/nee

Indien -ja-, hoe:.....
.....
.....
.....

17. Hoe groot is het percentage werknemers, dat aangesloten is bij een vakvereniging?



(markeer de lijn)

1. INTRODUCTION

As financial reporting procedures are not as standardised as in the UK, certain adjustments had to be made to the accounts in order to make a comparison between the two bases. This appendix will describe these adjustments. Before describing these adjustments it is necessary to discuss a few preliminary considerations. As no adjustments were made to the accounts of the Group 2 companies, most of this appendix will deal with Group 1 companies.

2. TAXATION AND FINANCIAL REPORTING IN THE NETHERLANDS

The rate of tax in the Netherlands is 48% over 50,000 guilders and a provisional tax assessment based on 75% of the tax payable for the preceding year is made seven months from the beginning of the company's accounting period. This tax is payable one month from the date the notice assessment is issued. The balance of tax is payable one month after the final assessment has been issued. Realised capital gains are taxed as trading income unless the asset is replaced within four years: in this case any gain is deducted from the cost of the replacement.

This affects my study in two ways. One - any provision for tax payable is nearly always a current liability; two - when a company revalues its fixed assets to arrive at RV a tax provision at 48% is reserved on the revaluation. In most cases the entries in the books are:

DR Fixed assets
CR Revaluation reserves with 52% of the revaluation
CR Deferred tax with the notional tax (48%) on the
revaluation

When adjustments are made to the cost of sales to reflect RV similar entries are effected.

Where the charge in the profit and loss account for depreciation and or cost of sales is based on RV it is usual to find the tax charge based on the RV profits. However, the tax payable is based on the historic cost profits, although in respect of stock, base stock in a form of LIFO is permitted. The difference between the tax based on RV and HC profit is then adjusted through deferred tax and tax payable as follows:-

CR	Tax payable	}	with the difference between tax based on HC and tax based on RV profit
DR	Deferred tax		

Where no other adjustments are effected through this account, the balance represents the difference between the tax on the revaluations minus the tax on the extra depreciation necessitated by them. In effect the balance represents the unallocated residue of the revaluations. This fact has been utilised in adjusting the accounts. Difficulties were encountered when it was not clear from the accounts the basis on which tax was calculated and when other provisions were adjusted through deferred tax.

When a company also made an adjustment to cost of sales in order to reflect current costs, the gross adjustment would be credited to a revaluation reserve; this reserve would be debited with the tax element, which would then be credited to the deferred account. This credit would be cancelled by the extra amount of tax payable because the charge in the accounts is based on RV and not HC. As this cancellation would have been reflected in the accounts at the year end, or very shortly afterwards, as only a small proportion of the tax liability on the year's

profits remains unpaid at the balance sheet date, it has been assumed unless evidence to the contrary was apparent, that the deferred tax account represented the unallocated portion of the revaluation increase. In cases where the deferred tax included tax provisions other than on revaluation, it was assumed arbitrarily, that 50% represented tax on revaluations and the other 50%, other provisions.

As we shall see, very few companies published both sets of figures and it was necessary to make a number of bold assumptions. Before describing the various adjustments it should be reiterated again that the definitions of capital employed and return on equity are based on Reid and Myddleton.¹ Bank overdrafts and loans have been treated as part of capital employed as no distinction is made in the accounts examined, between long and short interest.

3. THE ADJUSTMENTS

Two companies, Akzo and Philips, published both sets of data. It was found necessary to adjust the accounts of Philips in order to standardise the accounting numbers in line with the other companies. No adjustment was necessary to the accounts of Akzo. The relevant accounting policies, in respect of the various items that have to be taken into account when adjusting the accounts, either to or from a RV basis, are summarised in TABLE 1.

Eight of the 13 companies provided information on cost of sales at RV and it has been possible to ascertain the current cost profit of these companies. In relation to the other 5 companies no adjustment was made to reflect the increased cost of goods sold ie stock. It has been assumed that the stock

turnover of these companies was sufficiently rapid that no adjustment to reflect current cost was necessary. ² In the circumstances, this assumption was both reasonable and not inaccurate as:-

- i) no information was provided about cost of goods sold and the appropriate indices to apply;
- ii) stock turnover, as approximated by turnover divided by closing stock, was equal to or greater than four for four of the five companies: the other company's rate was nearly 3.5

Ten companies provided information about both RV and HC depreciation. It has therefore been necessary to make estimates for three companies. In two cases the difference between the two bases is not substantial as the magnitude of the revaluations was small. From the accounts it appeared that no company provided 'back-log' depreciation. On the whole it was felt that for Group 1 companies the resulting profit and loss figures were fairly accurate.

Most of the difficulties were encountered in calculating the HC capital employed. This was calculated by adjusting shareholders' funds for the extra accumulated depreciation charged in the RV profit and loss account and where applicable the accumulated adjustments to stock. It should be apparent from this discussion and TABLE 1 that these companies publish primarily RV data and not HC data and it is very difficult to reconcile the two sets of figures. This is compounded by the disclosure policies of some of these companies. Very few companies disclose the original cost of their fixed assets and the accumulated depreciation (on both bases) to date, movements on fixed assets and as stated above, the basis on

which taxation has been computed. No adjustment was made to long-term debt as it was not considered feasible and most suggested forms of CCA by government committees ³ and the professional bodies ⁴ recommend that adjustments are only made in special situations. Whilst the research gave rise to difficulties in recalculating the figures, it also highlighted a number of cases where there was a lack of disclosure as compared to UK and US companies. The various adjustments, for each company, are set out at the back of this appendix. It must be admitted that a number of figures have been approximated and these temper the conclusions reached on the basis of those figures.

In the case of the companies forming Group 2, no adjustments were made in respect of fixed assets and cost of goods sold, as insufficient information was available to make the necessary adjustments. However, based on the Group 1 companies these adjustments are frequently small. In addition more than half (9 companies) the companies had a turnover/closing stock rate of greater than four. (An adjustment for the change in the price of stock was made by one company and this was incorporated in the adjusted accounts. All the other adjustments were effected in order to standardise the accounts.) In the circumstances it was felt not unreasonable to use that profit and loss figure, based on RV depreciation, as a proxy for current cost profit or loss in the comparison of each group's interest and dividend cover. Clearly this approach is far from ideal and it follows that the conclusion stated above in connection with the Group 1 companies is also applicable to this group and to comparisons between the groups. This approach can be

justified on the grounds that it makes the most use of the data available and at the very least is a starting point for further research work. The schedules which follow outline and justify the various adjustments.

R E F E R E N C E S

1. REID W & MYDDLETON D R The meaning of company accounts
GOWER PRESS (1974)
2. Sandilands took the view that where the stock turnover was in excess of four and the rate of change in the price of the stock was not excessively high no adjustment was necessary.
Report of the Inflation Accounting Committee
Cmnd 6225 p 176
3. *ibid.* at 2 p 591
4. ED24: Current cost accounting
ASSC (1979)

Company Data

Table I : INFORMATION SUPPLIED IN THE ACCOUNTS

	Heineken	ACA	Wessanen	Meneba	KSH	Oce	Naarden	Elsevier	VNU	Gamma	Ten Cate
Cost of goods sold -RV	x	x	base stock	x	approximation	-	-	-	-	-	} mainly c
-IIC	-	x		-	x	x	x	x	x	x	
Depeciation -RV	x	x	x	x	x	x	x	mainly	mainly	x	} mixture
-IIC	-	x	x	x	x	x	x	-	-	x	
Revaluation surplus - plant and machinery	-	x	-	-	x	x	x	fixed assets	fixed assets	x	-
- inventories	-	x	N/A	-	x	N/A	N/A	N/A	N/A	N/A	-
- no break down	x	N/A	N/A	x	-	N/A	N/A	N/A	N/A	N/A	x
Total fixed asset revaluations	-	-	-	-	-	-	-	-	-	-	x
Deferred tax - no breakdown	-	x	FA only	x	not provided on revaluations	fixed assets and depreciation only	fixed assets and depreci- ation only	fixed assets & deprecia tion only	FA FA	FA FA	x x
Fixed assets - cost	-	-	-	-	-	-	x	-	-	-	x
RV, gross	x	x	-	x	-	x	x	-	-	x	Valuation &
RV, net	x	x	x	x	x	x	x	x	x	x	Valuation &
Depreciation - RV	x	x	-	x	-	x	x	x	-	x	Valuation &
- Cost	-	-	-	-	-	-	-	-	-	-	-
Fixed assets - net	-	-	-	-	-	-	-	-	x	-	-
Taxation	RV	RV	RV	RV	Assumption RV	RV	Assumption IIC	Assumption HC	Assumption HC	Assumption HC	Assumption RV

Note: By no breakdown is meant no analysis as between stock and fixed assets.

1
2
3
4

PHILIPS

		<u>RC with HC tax</u>		<u>HC with HC tax</u>
Per B/S		10,046.6		6,939.1
Adjustment p 45				1,545.2
SF				<u>8,484.4</u>
Liabilities		<u>11,235.4</u>		11,235.4
RC CE		21,282.0		
				<u>19,719.7</u>
Deferred Tax				1,549.2
				<u>18,170.5</u>
		<u>HC Profit after HC tax</u>	<u>RC Profit after RC tax</u>	<u>RC Profit after HC tax</u>
RC profit		666.00	666.0	666.0
Adjustment		397.9		
		<u>1063.9</u>		
RC tax	324.8			
HC tax	<u>191.0</u>			
		515.8	324.8	515.8
		<u>548.8</u>	<u>341.2</u>	<u>150.2</u>
Non consolidated sub		(15.0)	(15.0)	(15.0)
		<u>533.1</u>	<u>326.2</u>	<u>135.2</u>
Minorities		(107.7)	(107.7)	(107.7)
		<u>425.4</u>	<u>218.5</u>	<u>27.5</u>
Shareholders equity		8484.3	10,046.6	10,046.6
Return on equity		<u>5.01</u>	<u>2.17</u>	<u>0.27</u>
<u>Capital Employed</u>		<u>RC</u>		<u>HC</u>
		21,282		18,170.5
Bank overdraft		2,040.2		2,040.2
		<u>23,322.2</u>		<u>20,210.7</u>
Debt		7,138.0		7138.0
Gearing		30.61		35.32

	<u>HEINEKEN</u>	
Fixed asset revaluations	68,0	<u>Gross</u> 68.0
Deferred tax	32.64	
	<hr/>	
	35.36	
Increase in revaluation account	28.25	(13.67) Stock adjustment
	<hr/>	
:	7.11	<u>54.33</u>
	<hr/>	
<u>Deferred Tax Account</u>		
		<u>Extra charge in the P&I</u>
Opening Balance	105.22	
Auditors	25.53	(13.67) Stock
	<hr/>	
	130.75	
closing balance	122.29	17.63 Extra charge in the P&I
	<hr/>	
	8.46	<u>3.96</u>
	<hr/>	

Cummulative charge

As there is no breakdown of the revaluation surplus we cannot ascertain HC, therefore an assumption must be made.

$$\frac{\text{Extra Depreciation in P\&L}}{\text{RV Depreciation in P\&L}} = \frac{17.63}{104.96} = 16.8\%$$

$$\begin{aligned} \text{Extra cummulative depreciation} &= 0.168 \times 749,921 \\ \text{Gross} &= 125,963 \\ \text{Net} &= 65,501 \end{aligned}$$

Stock included in Revaluation Reserves

$$\text{Assume: } \frac{\text{Extra Depreciation in P\&L}}{\text{RV Depreciation in P\&L}} = 1 - \left(\frac{\text{HC of the fixed assets}}{\text{RV of the fixed assets}} \right)$$

$$\begin{aligned} \text{ie. HC of fixed assets} &= 0.832 \times 1,821,200 \\ &= 1,515,238 \\ \text{Gross Revaluation Surplus} &= 305,962 \\ \text{Net Revaluation Surplus} &= 159,100 \end{aligned}$$

ie. assume that no part of the Revaluation Reserves represents stock

		<u>HC profit after HC tax</u>	<u>RC profit after RC tax</u>	<u>RC profit after HC tax</u>
RC profit		113.32	113.32	113.32
Adjustments		3.96		
		<u>117.96</u>		
Tax	55.27			
	1.90	57.17	55.27	57.17
		<u>60.11</u>	<u>58.05</u>	<u>56.15</u>
Share in non - consolidated subs		8.71	8.71	8.71
		<u>68.82</u>	<u>66.76</u>	<u>64.86</u>
Minorities		3.87	3.87	3.87
		<u>64.95</u>	<u>62.89</u>	<u>60.99</u>
Shareholders funds		635.51	722.44	722.44
Return on equity		10.22	8.71	8.44
		<u>RC</u>	<u>HC</u>	
<u>Capital Employed</u>		1251.64	1042.43	
Long Term debt		298.22	298.22	
Gearing		23.83	28.61	

ACF

Revaluation Reserves

Net	31,145	
Gross .. 100/52	59,894	- (1)

Deferred Tax

Net - unexpired	13,016	
Gross .. 100/48	27,117	- (2)
Expired (1) and (2)	32,777	gross
Accumulated depreciation	17,044	net
	<hr/>	
stock to add back	20,036	

	<u>HC profit after HC tax</u>	<u>RC profit after RC tax</u>	<u>RC profit after HC tax</u>
RC profit	23.13	23.13	23.13
Adjustment	2.70		
	<hr/>		
	25.83		
Tax	1.30		
	<u>10.50</u>		
	11.80	10.50	11.80
	<hr/>	<hr/>	<hr/>
	14.03	12.63	11.33
Bonuses	0.55	0.55	0.55
	<hr/>	<hr/>	<hr/>
	13.48	12.08	10.78
	<hr/>	<hr/>	<hr/>
Shareholders funds	126.799	140.9	140.9
Return on equity	10.63	8.57	7.65
Capital employed	151,051	197,195	

WESSANEN

Revaluation reserves and deferred tax cannot be used to ascertain accumulated depreciation because tax is based on HC.

(1) Hc depreciation in P&L account		14936
Extra depreciation in P&L account	(1-2) 100	4915
	<u>24.8</u>	<u> </u>
(2)		19851
Revaluation surplus - gross		<u>88923</u>
<u>Assumption</u> - extra depreciation to date is		
in same proportion as P&L charge		<u>22053</u>
Tax element in surplus p32 approx. 31%		<u>27761</u>
therefore proportional tax element in depreciation		<u>6885</u>

stocks

Assumption - 25% of the amount stated in the B/S represents revaluation ie.
 0.25 x 168761 42190
 No tax element necessary - base stock

	<u>HC profit after HC tax</u>	<u>RC profit after RC tax</u>	<u>RC profit after HC tax</u>
Current cost profit	26.63	26.63	26.63
Extra depreciation + stock	12.36		
	<u>38.99</u>	<u>26.63</u>	<u>26.63</u>
Tax HC 16.23			
RC (2.06) adj	16.23	14.17	16.23
	<u>22.76</u>	<u>12.46</u>	<u>10.40</u>
Shareholders funds	187.97	233.96	233.96
Return on equity	12.11	5.33	4.45
Capital employed	410.99	484.74	484.74
Debt	207.26	207.26	
Gearing rate	50.43	42.76	

MENEBA

Revaluations

Fixed assets revaluations	6951
Stock	1927
	<u> </u>
	8878
	<u> </u>

Cummulative charge

As there is no breakdown of the revaluation surplus we cannot ascertain HC therefore, an assumption must be made.

	$\frac{\text{Extra depreciation in P\&L}}{\text{RV depreciation in P\&L}} = \frac{4243}{23798} = 17.83$
Extra cummulative depreciation = 0.1783×247050	= 44049
- Net	22905

Stock included in revaluation reserves

Balance, Deferred Tax - unexpired increase	26046
Gross	<u>54263</u>
Assumption 1 : <u>add</u> extra cummulative depreciation	44049
	<u>98312</u>
<u>Less</u> tax @ 48%	47190
	<u>51122</u>

Rejected:

Revaluation reserve

No stock revaluation would be included in stock revaluation reserves.

Assumption 2 : Suppose 76% of the revaluations are attributable to FA + 22% to stock (these figures are based on the revaluations in 1975)

Revaluation Account

Balance at 31.12.75	48920
FA 76%	37179
Stock 22%	10762
	<u>47941</u>
<u>Gross</u>	
FA 37179 x 100/52	71498

Revaluations of FA = $\frac{71498}{529153}$ = 13.5

Depreciation provision in B/S	<u>247050</u>
Extra provision therefore 0.135×247050	33352
Tax (43%) based on average rate for revaluations	<u>14341</u>
Net	<u>19011</u>

In the circumstances, assumption (2) is more reasonable.

	HC profit after HC tax	RC profit after RC tax	RC profit after HC tax
RC profit	11.43	11.43	11.43
Adjustments	6.17		
	<u>17.60</u>		

	<u>HC profit after HC tax</u>	<u>RC profit after RC tax</u>	<u>RC profit after HC tax</u>
	17.60		
Tax	8.12	5.16	8.12
	<u>9.48</u>	<u>6.27</u>	<u>3.31</u>
Share in non- consolidated subs	2.80	2.80	2.80
	<u>12.28</u>	<u>9.07</u>	<u>6.11</u>
Shareholders funds	115.63	139.41	139.41
Return on equity	10.62	6.51	4.38
Capital employed	338.64	388.46	
Debt	200.33	200.38	
Gearing rate	59.16	51.57	

KSH

1 Tax policy is not explained	
2 A deferred tax account is no longer kept.	
3 Adjustments in P&L taken from the P&L A/C and notes	
4 Tax - relief assumed @ 48%	
5 Opening Balance on revaluation A/C	114.4
Includes stock revaluation reserve	<u>15.9</u>
Transfer from Deferred tax	98.2
	<u>13.6</u>
	111.8
Revaluation - 1975 and study increases	<u>8.8</u>
Total amount of revaluations - gross	<u>120.6</u>

Revaluation Surplus

Opening Balance (net)	114.1
(gross)	219.4
(tax)	105.3
Balance on deferred tax account	
(net)	13.6
Difference	91.7
Gross	191.04
Tax	99.34
	<u>91.70</u>
Net	91.70
Add 1975	4.50
	<u>96.20</u>

This analysis was rejected because it implies that the fixed assets are nearly written off and that the gross value of the fixed assets in the balance sheet are nearly eight times the present net book value.

Assume, as above, that the surplus is 219.4 and that half has been written off ie. 109.70 and that tax has been based on RV.
 Revaluation surplus to add back, $0.52 \times 109.70 = 57.04$

Shareholders funds

	<u>RC</u>	<u>HC</u>	
Adjustments - deferred tax	296.39 (13.60)	175.75 8.28	Stock
equalisation	282.79 (16.00)	184.03 (16.00)	
	266.79 4.12	168.03 57.04	Accumulated depreciation
Shareholders funds	270.91	225.07	
Equalisation	16.00	16.00	
Deferred Tax	13.6	-	
Debentures and minorities	85.32	85.32	
Provisions	32.65	32.65	
Long term loans	248.05	248.05	
Bank overdrafts	666.53 27.25	666.53 27.25	
	<u>693.78</u>	<u>634.34</u>	

	<u>HC profit after HC tax</u>	<u>RC profit after RC tax</u>	<u>RC profit after HC tax</u>
RC profit	(21.97)	(21.97)	(21.97)
adjustments - stock etc	12.50		
	(9.47)		
<u>Less tax</u>	4.55	10.55	4.55
	(4.92)	(11.42)	(17.42)
Shareholders funds	225.07	270.91	270.91
Return on equity	(2.19)	(4.22)	(6.43)
Debt	360.30	360.30	

Gearing

<u>HC</u>	<u>RC</u>
51.93	58.80

OCE

Revaluation account

Revaluation during the year, net	10.82
gross	20.81
tax	9.99

Increase in deferred tax account	7.16
Net increase in deferred tax account	2.83
Difference between RC and HC depreciation	5.90

<u>Revaluation account - ignoring exchange rate changes during year</u>			
	net	360.52	Prior year exchange rate:
	gross	69.33	net
	tax	33.28	gross
			19.19

Deferred Tax account

Adjusted Appropriation from the revaluation account 1974 and 1975, 46030 ignoring exchange rate changes

Gross	88.52	} Appropriated to Deferred Tax	42.49	
Tax	42.49		deferred tax A/C	40.46
Net	46.03			
		Accumulated Depreciation	<u>2.03</u>	

Reject assumption that accumulated depreciation can be calculated through Deferred tax account

Assumption 2

Increase in Revaluation Gross - 88.52

$\frac{\text{P\&L HC depreciation}}{\text{B/S RV depreciation}} = \frac{16.2}{22.1} = 73\%$

if: $\frac{\text{B/S HC depreciation}}{\text{B/S RV depreciation}} = \frac{104403}{143018} = 73\%$

Extra depreciation = $0.27 \times 143018 = 38615$

ie. 44% of the total revaluation - a not unreasonable assumption

Net increase in Depreciation = 20079

ie. 0.52 38615

To take account of the fact that deferred tax includes provisions other than/or revaluations, include half in HCSF ie. 20228

	<u>HC profit after HC tax</u>	<u>RC profit after RC tax</u>	<u>RC profit after HC tax</u>
RC profit	43.68	43.68	43.68
Adjustment	5.9		
	<u>49.58</u>		
Tax	18.08		
	<u>2.83</u>	18.08	20.91
	20.91	25.60	22.77
	<u>28.67</u>		
Non consolidated subs	0.40	0.40	0.40
	<u>29.07</u>	26.00	23.17
Minorities	1.19	1.19	1.19
	<u>27.88</u>	24.81	21.98
Shareholders funds	253.32	273.04	273.04
Return on equity	11.01	9.69	8.05

	<u>HC</u>	<u>RC</u>
Capital employed	450.75	505.92
Debt	153.24	153.24
Gearing	34.01	30.39

ELSEVIER

- 1 Deferred tax provision is not helpful as it has been affected by newly acquired foreign companies and domestic point ventures. This factor has been ignored and the closing balance on this account has been utilised.
- 2 Fixed asset values are reported at net RV
- 3 Assume RV tax
- 4 Ignore exchange rate fains on non-monetary assets

Revaluation surplus (reserve)

Net	9212
Tax	8503
Gross	17715

Deferred tax

Closing balance	6676
Tax from RR	8503
Difference	<u>1827</u>
Gross 100/48	3806
Overprovision Net	<u><u>1979</u></u>

The change in the deferred tax are not analysed and the difference between the opening and closing figures are large. It is not possible to estimate the year's overprovision from this difference.

Assumption: extra depreciation charge 10% to total ie.

0.10 x 844 : this is about one quarter of the accumulated extra depreciation

	<u>HC profit after HC tax</u>	<u>RC profit after RC tax</u>	<u>RC profit after HC tax</u>
RC profit	29.96	29.96	29.96
Adjustment	0.84		
	<u>30.80</u>		
Tax	12.27	11.87	12.27
	<u>18.53</u>	<u>18.09</u>	<u>17.69</u>
Shareholders funds	92.05	100.01	100.01
Return on equity	20.13	18.09	17.69
Debt	73.77	73.77	

	<u>HC</u>	<u>RC</u>
Capital employed	190.28	204.92
Gearing	38.77	36.00

NAARDEN

- 1 The deferred tax and revaluation account could not be reconciled
- 2 The P&L accounts stated HC and RV depreciation.
To ascertain the extra accumulated depreciation provision it was assumed that:-

$$\frac{\text{B/S HC depreciation}}{\text{B/S RV depreciation}} = \frac{\text{P\&L HC depreciation}}{\text{P\&L RV depreciation}}$$

The extra accumulated charge, 12448 was approximately 35% of the Rev. surplus

	<u>HC profit after HC tax</u>	<u>RC profit after RC tax</u>	<u>RC profit after HC tax</u>
HC/RC loss after minorities etc	(0.19)	(1.10)	(1.93)
Shareholders funds	89.61	112.29	112.29
Return on equity	(0.21)	(0.98)	(1.72)
Debt	71.59	71.59	
	<u>HC</u>	<u>RC</u>	
Capital employed	176.49	208.83	
Gearing	40.56	34.28	

GAMMA

- 1 It was not possible to calculate the extra accumulated depreciation from the deferred tax account as tax was computed on HC principles

- 2 Assumption:

$$\frac{\text{HC P\&L Depreciation Charge}}{\text{RV P\&L Depreciation Charge}} = \frac{\text{B/S HC depreciation}}{\text{B/S RV depreciation}}$$

$$203.29 \times \frac{10.1}{12.85} = \text{B/S HC depreciation}$$

$$159.79 = \text{B/S HC}$$

$$\text{extra depreciation} = 203.29 - 159.79$$

$$= 43.5$$

This must be rejected because the fixed asset revaluation reserve is only 13.00 (net).

Alternative Assumption:

Revaluation reserve - gross 25.00

Assume 50% has been charged in the P&L as extra depreciation ie. 12.5

- 3 Deferred tax - as this includes provisions other than on revaluation, only half the provision has been deducted from HC capital employed.

	<u>HC profit after HC tax</u>	<u>RC profit after RC tax</u>	<u>RC profit after HC tax</u>
HC/RC profit	6.01	4.58	3.26
Shareholders funds	133.24	133.74	133.74
Return on equity	4.51	3.42	2.44

	<u>HC</u>	<u>RC</u>
Capital employed	207.9	221.33
Debt	41.16	41.16
Gearing	19.8	18.6

VNM

- 1 Fixed assets only stated @ net RV; 24158
- 2 Revaluation reserve 56098
- 3 Deferred tax 52500
- 4 HC net book value stated ; 164708
- 5 HC/RC P&L depreciation = 98.4%

Accumulated Depreciation Provision

Assumptions:-

$$\frac{\text{HC P\&L depreciation}}{\text{RC P\&L depreciation}} = \frac{\text{HC B/S Depreciation}}{\text{RV B/S Depreciation}}$$

This assumption was rejected as the extra depreciation is so small compared to the disparities in the RV and HC book values.

As $\frac{\text{HC net book value}}{\text{RV net book value}} = \frac{164708}{241508} = 68\%$

it seems not unreasonable to assume that 35% of the total revaluation reserves have been charged in the P&L

ie. $0.35 \times 108598 = 38009$

No adjustment for tax is necessary as HC tax has been charged in the accounts.

	HC profit after HC tax	RC profit after RC tax	RC profit after HC tax
HC/RC tax	17.07	16.84	16.63
Shareholders funds	230.92	249.01	249.01
Return on equity	7.39	6.76	6.68
Debt	116.50	116.50	

	HC	RC
Capital employed	383.59	454.19
Gearing rate	30.37	25.65

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	Gross	Tax	Net
Fixed assets - B/S value	320.3		
<u>Less cost</u>	298.1		
Revaluation surplus	<u>22.2</u>	10.7	<u>11.5</u>
			<u>Gross</u>
Revaluation reserve	45.55		
<u>Less FA revaluation</u>	11.50		
Stock revaluation	net 34.05	31.45	65.50
Deferred tax	30.47		
Should be:	<u>42.45</u>		24.96

Difference too large to be accumulated depreciation given the small difference. Deferred Tax must include other provisions.

Assumption:

Profit and Loss

$\text{P\&L HC} = \frac{\text{HC of FA in B/S}}{\text{RV of FA in B/S}} \times \text{P\&L A/C Depreciation charge}$

$= \frac{298.1}{320.3} \times 21.2 = 19.7$

Extra depreciation = $21.2 - 19.7 = 1.5$

Balance sheet re Accumulated Depreciation

Assumption:

$\frac{\text{HC depreciation in B/S}}{\text{RV depreciation in B/S}} = \frac{\text{HC depreciation in P\&L}}{\text{RV depreciation in P\&L}}$

Therefore, HC depreciation in B/S = $\frac{298.1}{320.3} \times 222.1$

= 206.7

Extra depreciation = 222.1 - 206.7
 = 15.4
 Net of tax = 0.52 x 15.4
 = 8.01

Other Assumptions:

Stock adjustment - taken from above

Deferred Tax - in recognition that it includes other items half has
 been included in the capital employed.

	<u>HC profit after HC tax</u>	<u>RC profit after RC tax</u>	<u>RC profit after HC tax</u>
HC/RC Loss after minorities	(27.71)	(28.97)	(30.14)
Shareholders	138.64	142.12	142.12
Return on equity	(19.99)	(20.38)	(21.21)
	<u>HC</u>	<u>RC</u>	
Capital employed	302.14	320.87	
Debt	118.14	118.14	
Gearing	39.1	36.82	

LIST OF ABBREVIATIONS USED IN THE THESIS

CC	Current Costs
CCA	Current Cost Accounting
CFA	Cash Flow Accounting
COCOA	Continuously Contemporary Accounting
COP	Current Operating Profit
CPP	Current Purchasing Power Accounting
EPV	Expected Present Value
HC	Historic Cost
HCA	Historic Cost Accounting (Or Historical Cost Accounts)
HGs	Holding Gains
NRV	Net Realisable Value
PVA	Present Value Accounting
RC	Replacement Cost
RCA	Replacement Cost Accounting
RCE	Return on Capital Employed
RV	Replacement Value
RVs	Replacement Values
SH	Shareholders

LIST OF JOURNAL ABBREVIATIONS USED
IN THE REFERENCES

A	Accountancy
AAA	American Accountancy Association
ABR	Accounting and Business Research
AR	Accounting Review
CA	Certified Accountant
IA	The Investment Analyst
JA	Journal of Accountancy
JAR	Journal of Accounting Research
JBF	Journal of Business Finance
JBFA	Journal of Business Finance and Accounting