UTILITY OF INFLATION ACCOUNTING DATA TO INVESTORS

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ABSTRACT

The objective of financial reporting is to provide decision-relevant information to readers of financial reports. This paper presents the findings from an empirical study which examines the ability of inflation accounting data to explain the market values of UK listed companies. A recently developed cross-sectional valuation model incorporating measures from both the income statement and the balance sheet is used in the study. The study explores whether or not company policy towards the disclosure of inflation accounting data in the pre-mandatory period affects the explanatory power of these data. The analysis is performed for two periods to test for any evidence of a learning effect in respect of the inflation accounting data.

INTRODUCTION

Since the early 1970s, considerable emphasis has been placed on the utilitarian nature of financial reporting. The high rate of inflation during the 1970s prompted serious questioning of the utility of conventional accounting practices. This led the Accounting Standards Committee (ASC) to publish SSAP 16 (ASC, 1980) requiring the mandatory disclosure of current cost accounting (CCA) information. This paper presents the findings from an empirical study which investigates the utility of inflation accounting data to investors.

The principle objectives of the study are:

- To examine the explanatory power of inflation accounting data in relation to the market value of UK listed companies
- To determine whether or not company policy on the disclosure of inflation accounting data in the pre-mandatory period affects the explanatory power of this data
- To discover if a learning lag exists in relation to inflation accounting data.

PRIOR EVIDENCE ON THE UTILITY OF INFLATION ACCOUNTING DATA

Several studies — for example, Beaver, Christie and Griffin (1980), Ro (1980), Appleyard and Strong (1984), and Brayshaw and Miro (1985) — attempted to assess the information content of inflation accounting data. These studies concentrated on identifying a price reaction and/or an increase in the volume of trading as evidence of the information content of inflation accounting data. The majority of these studies found no statistically significant reaction specific to the disclosure of these data. This finding was evident across a variety of testing procedures and different capital markets.

One explanation consistent with the previous finding is that the market had already discounted the effects of the inflation accounting information prior to its disclosure in financial reports. Studies of the association between stock market measures and inflation accounting data are helpful in assessing the extent to which this explanation holds. Short (1978), Baran, Lakonishok and Ofer (1980), Cooper (1980) and Nunthirapakorn and Millar (1987) examined the association between the market beta and inflation accounting measures. Although evidence supporting a relationship between inflation accounting risk measures and the market beta was found, it was unclear whether this relationship was stronger than for historical cost accounting (HCA) risk measures.

Other studies investigated the ability of inflation accounting data to explain share returns/prices, and examined the incremental explanatory power (IEP) of this data. Many of the earlier studies, such as Beaver, Griffin and Landsman (1982), Beaver and Landsman, (1983), Matolcsy (1984) and Board and Walker (1985) concluded that the inflation accounting measures exhibit no significant IEP over the explanatory power contributed by HCA measures.

However, more recent studies have presented some evidence supporting the IEP of inflation accounting data. Bublitz, Frecka and McKeown (1985) found that SFAS 33 (FASB, 1979) data possesses IEP for share returns. Murdoch (1986) found weak evidence that current purchasing power returns on equity possesses IEP over historical cost returns on equity for annual share returns. Using a simple valuation model, Darnell and Skerratt (1989) found that the current cost (CC) adjustment to the historical cost (HC) earnings per share figure is significant in explaining differences in relative share values of UK companies.

Partitioning a sample of firms according to their degree of responsiveness

to input price changes, Hopwood and Schaefer (1989) found a significant incremental association between the CC income variable and security returns. Their evidence also indicated that the reaction to inflation accounting information is largely industry specific. Evidence that the response to inflation accounting data may be industry specific is also provided by Bernard and Ruland (1987) and Lobo and Song (1989).

Overall, the evidence on the explanatory power of inflation accounting data is mixed. However, in general the findings from those studies testing the explanatory power of inflation accounting data is promising when more refined sampling techniques are employed. This suggests the need for further research. This paper reports the findings from a study which incorporates features which build on earlier research findings.

A VALUATION APPROACH

The current study uses a valuation approach to assess the utility of inflation accounting data to investors. Essentially, this approach investigates the possibility of a relationship between the market value of a firm at time t and accounting data at time t. Atiase and Tse (1986) portray this relationship as follows:

Accounting and other available information at time t	——>	Predicted Accounting Variables	Predicted Dividends discounted	——> Current Share Prices

The existence of the above relationship depends on the extent to which accounting data reflects value relevant information. Accounting data are value relevant if they assist investors in predicting the amount and uncertainty of the cash flows which their investment can generate.

In the context of the inflation accounting debate, Lev and Ohlson (1982) regard the valuation approach as being of particular importance to accounting policy makers in helping them assess the consequences of their decisions. In particular, valuation analysis is very useful in distinguishing between possible explanations of the absence of a market reaction to inflation accounting data. Possible explanations are that the information is not pertinent to share valuation or the information is relevant but it has already been reflected in share prices. Clearly, these two explanations have significantly different implications for accounting policy makers.

Valuation analysis has the ability to distinguish between these explanations (see Lev and Ohlson, 1982; Atiase and Tse, 1986).

Furthermore, Lev and Ohlson (1982) and Atiase and Tse (1986) recognised that the valuation approach avoids certain practical problems encountered in information content studies. Specifically, the following problems are either avoided or their impact is not as crucial for valuation studies: selecting the appropriate test period and test data; controlling for confounding events; and deriving an expectational model for inflation accounting data and abnormal share returns.

Despite the opportunities offered by a valuation approach, there are problems associated with it. Gonedes and Dopuch (1974) identified two main difficulties, namely, the lack of theory and econometrical and statistical problems.

Brennan (1991) commented that the absence of an adequate theoretical framework for specifying the structure of the relationship between accounting data and share prices weakens much of the valuation literature. Recently, some progress has been made in the development of theoretical models linking accounting variables to share prices (see Brennan, 1991). One of these models is exploited in this study.

Econometrical and statistical problems include multicollinearity, heteroscedasticity, omitted variables and the measurement of independent variables. The effect of these problems is substantial for those studies attempting to derive a valuation model which can be used to predict share prices. However, the implications of these problems may not be as great for those studies which investigate whether a particular set of variables provide IEP for share prices relative to another set of variables.

THE VALUATION MODEL

The model employed in the current study is based on a model of accounting-based asset valuation developed by Ohlson (1989). The model incorporates measures from both the income statement and the balance sheet. Studies by Freeman, Ohlson and Penman (1982), Harris and Ohlson (1987), Ohlson (1989), Ou and Penman (1989) have shown that a valuation model incorporating both income and balance sheet measures has greater explanatory power than a model which focuses exclusively on the income statement or the balance sheet.

To construct his model, Ohlson begins by stating that in a world of certainty the market equilibrium value of a company is equal to the present value of future expected dividends. However, he recognises that in the real world of uncertainty, it is not possible to determine the present value of future expected dividends. Given this, Ohlson constructs a model which is applicable in an uncertain world, which uses current period earnings, dividends and book values to predict future expected dividends.

Earnings and book value are value relevant information since they are related to future expected dividends. The book value of equity represents assets that have the ability to generate future earnings out of which future dividends can be paid. As dividends reduce book values, they also reduce future earnings of the company. In this context, capital contributions increase book values which results in an increase in future expected earnings, so new capital can be viewed as negative dividends.

Ohlson assumes a linear mapping between current period earnings, dividends, book values and the value of the company. This results in Ohlson's model being formulated as shown in **Table 1**.

Table 1: Ohlson's Linear Valuation Model

$$P_t = B_1X_t + B_2Y_t + B_3D_t$$

where

P_t	=	price of the security at time t
X_t	=	earnings realised between dates t-1 and t
Y_t	=	book value (or owner's equity) at date t
D_t	=	dividends, net of capital contributions between dates t-1 and t
B	=	regression coefficients

Ohlson's model is not restricted to the variables in **Table 1**. Other variables are value relevant if they are useful in predicting either future expected earnings or future expected book values.

Applying Ohlson's model to this study, an IEP approach is employed to test for the utility of inflation accounting data. This approach regards

the inflation accounting measures as being supplementary to HCA data. Both the FASB (1979) and the ASC (1980) in their pronouncements on inflation accounting viewed these data as being supplementary to HCA data. The approach was also adopted by Bublitz, Frecka and McKeown (1985), Darnell and Skerratt (1989) and Bernard and Ruland (1991), and these studies showed that inflation accounting data added to the explanation of share prices given by HCA data. Adopting an IEP approach results in Ohlson's model being formulated as set out in **Table 2**. The independent variables were computed from the data available on the Datastream database.

The model given in **Table 2** uses the company's market value as the dependent variable. To derive this value the share prices used were the closing prices on the day the financial reports were considered to be publicly available. The public disclosure date was assumed to be the date that the reports were received by the Extel Group. This date was extracted from the Extel Analysts' Service Cards.

An advantage of formulating the model in this way is that it allows for the significance of unrealised holding gains to be tested — the variable CCADJE measures unrealised holding gains of the period, and CCADJBV measures cumulative unrealised holding gains.

Proponents of CCA point out that unrealised holding gains represent actual economic phenomena occurring in the current period, and therefore should be recognised (see Kam, 1990, p. 434). According to Edwards and Bell (1961, p. 224), the division of income into operating income and holding gains would improve inter-period and inter-company comparisons of productive efficiency. Revsine and Weygangt (1974) justified the separation of operating and holding gains on the basis that these components have different patterns of repeatability.

In contrast, Praskash and Sunder (1979) argued that separate disclosure of operating and holding gains offers no benefits. They believed that, in the majority of situations, holding and operating decisions are interdependent and that the analysis of income is meaningless.

Details on holding gains may be of particular relevance to investors if they reflect future earning power. Revsine (1973, p. 88) suggested that the inclusion of holding gains as income may be justified on the grounds that changes in asset market values reflect changes in future cash flows which are expected to be generated from the use of that asset. This is based on the assumption that an asset's market value is determined by

Table 2: Valuation model

$CV_t = f(k_1 CLSEHC_t + k_2 CCADJBV_t + k_3 EARNHC_t + k_4 CCADJE_t + k_5 DIV_t + e_t)$

where

CV_t = Share Price x Number of Ordinary Shares Outstanding at period t (Company Value).

$CLSEHC_t$ = HC Closing Book Value of Shareholders' Equity, (that is, closing ordinary share capital plus reserves(*) at period t).

$CLSECC_t$ = CC Closing Book Value of Shareholders' Equity, (that is, closing ordinary share capital plus reserves(*) at period t).

$CCADJBV_t$ = $CLSECC_t - CLSEHC_t$

$OPSEHC_t$ = HC Opening Book Value of Shareholders' Equity, (that is, opening ordinary share capital plus reserves(*) at period t-1).

$EARNHC_t$ = $CLSEHC_t - OPSEHC_t$ + Dividends less New Capital Introduced in period t.

$OPSECC_t$ = CC Opening Book Value of Shareholders' Equity, (that is, opening ordinary share capital plus reserves(*) at period t-1).

$EARNCC_t$ = $CLSECC_t - OPSECC_t$ + Dividends less New Capital Introduced in period t.

$CCADJE_t$ = $EARNCC_t - EARNHC_t$

DIV_t = Dividends for the Ordinary Shareholders for period t, less New Capital introduced in the period t.

$k_1 + k_2 + k_3 + k_4 + k_5 = 1$

** Note: reserves are defined net of intangible assets*

discounting at some appropriate rate, future operating cash flows expected to be generated from using the asset. Therefore, increases or decreases in an asset's market value represent implicit changes in the asset's operating cash flow expectations. This implies an asset's market value is equivalent to its economic value.

Revsine (1973, pp. 99-104) demonstrated how, in a perfectly competitive economy, replacement cost income is virtually identical to economic income. When perfect competition does not exist, replacement cost income is an approximation of economic income. Revsine recognised that for individual companies, as asset prices increase the related operating cash flows can either increase, decrease or remain constant. Thus, firms may differ in their ability to respond to asset price changes. Where firms can successfully pass on price increases, holding gains may reflect increased future operating cash flows. In contrast, firms which cannot pass on input price increases will suffer a decrease in their future operating cash flows.

Revsine (1973, p. 188) suggested that empirical research is needed to discover the usefulness of replacement cost income in predicting future earnings flows. The model used in this study provides an insight into this issue by assessing the utility of unrealised holding gains in relation to company values.

An issue related to the separation of operating and holding gains is whether these gains should be reported as income or capital maintenance adjustments. Edwards and Bell (1961) and Revsine (1973) support treating these gains as income. However, SSAP 16 in adopting a physical capital maintenance concept excluded holding gains from income, such gains represented amounts which must be retained in the business. Although this issue is not directly considered in the present study, an examination of the direction of the relationship between company value and holding gains offers an insight to the discussion.

DATA COLLECTION

All UK industrial quoted companies were selected from *The Times* 1000 for the year 1982/83. This produced a preliminary sample of 530 companies. The Datastream database was searched to establish if the accounting and market value data were available for all of the relevant years. This yielded a final sample of 289 companies which are divided into two groups based on their policies towards the disclosure of inflation

Table 3: Definition of company groups

Group	Type of Company	No. of Companies
1	*Supportive Companies:* those which disclosed inflation accounting data prior to the mandatory disclosure period.	150
2	*Reluctant Companies:* those which disclosed inflation accounting data at or after the start of the mandatory disclosure period.	139
		289

accounting data in the pre-mandatory period. A company's policy towards the disclosure of inflation accounting data was determined by examining the financial reports of the companies in the pre-mandatory period and/or receiving the information from the companies' financial controllers. Definitions of the groups and the number of companies in each are presented in **Table 3**.

This division of companies provides the opportunity to assess whether or not company policy towards the disclosure of inflation accounting data in the pre-mandatory period is associated with the explanatory power of the data. Accounting regulators (FASB, 1979; ASC, 1980) commented that the disclosure of inflation accounting data would involve a learning process on the part of preparers. In addition, research by Archer and Steele (1984), Page (1984) and Carsberg (1984a) showed that companies holding a positive attitude towards compliance took greater care in deriving the inflation accounting adjustments and that the management and the auditors of these companies had greater confidence in these adjustments. Given this evidence, it is possible that a difference may exist in the explanatory power of the inflation accounting adjustments for the Supportive and Reluctant Companies.

The analysis is performed for two periods, as it is an objective of the study to explore whether or not a learning lag exists in relation to inflation accounting data. The possible existence of a learning lag was offered by other studies (such as Arbel and Jaggi, 1978; Soroosh Joo, 1982; Appleyard and Strong, 1984) to explain the market's failure to utilise

inflation accounting data. In addition, FASB (1979, SFAS 33, para 14) and the ASC (see Carsberg, 1984b, p. 1) recognised that the measurement and use of inflation accounting data would also require a substantial learning process on the part of users.

Deriving the valuation model for two periods requires extracting HC and CC accounting data for the first three years of mandatory disclosure of SSAP 16 information. Taking the first three years of mandatory disclosure results in the sample companies having varying accounting year-ends, Lobo and Song (1989) commented that selecting companies with different reporting dates should reduce the impact of cross-sectional dependence, thereby reducing the bias in estimating standard errors.

METHODOLOGY AND RESULTS

The methodology adopted in the study is to use multiple linear regression to apply the model described in **Table 2** cross-sectionally to a sample of UK listed companies. The model presented in **Table 2** is referred to as the basic model.

The statistical analysis begins by including dummy variables in the basic model to test for the equality of the regression models for the Supportive and Reluctant Companies. The analysis indicates that separate models should be derived for the two groups of companies, and this is undertaken in all subsequent analysis.

In an effort to develop a statistically valid model within Ohlson's theoretical framework, the basic model was deflated by Sales and the historical cost value of shareholders' equity (CLSEHC). For ease of reference, the models analysed are given abbreviated titles, definitions of these titles are presented in **Appendix 1**.

Initially, the analysis focuses on the overall explanatory power of the models, by examining the R^2 associated with each model. An F test is performed to test the significance of R^2. Details of R^2 and the related F statistic for each of the models, and for the two groups of companies for both periods, are presented in **Table 4** (figures have been rounded to three decimal places).

For the Supportive Companies, **Table 4** indicates a high R^2 value. The probability that the relationship is caused by chance is less than .00005. For four of the six models, over 50% of the variation in the dependent variable

Table 4: Significance of R^2

Supportive Companies

Model	R^2	F-value	Significance of F-value
BMP1	.828	138.183	< .00005
BMP2	.839	149.670	< .00005
D1BMP1	.684	51.902	< .00005
D1BMP2	.707	57.965	< .00005
D2BMP1	.416	25.807	< .00005
D2BMP2	.465	31.512	< .00005

Reluctant Companies

Model	R^2	F-value	Significance of F-value
BMP1	.696	60.769	< .00005
BMP2	.735	73.676	< .00005
D1BMP1	.736	61.885	< .00005
D1BMP2	.695	50.614	< .00005
D2BMP1	.612	52.837	< .00005
D2BMP2	.570	44.390	< .00005

is explained by the models. This percentage falls to between 41.6% and 46.5% for the basic model deflated by CLSEHC for periods 1 and 2. The loss in explanatory power may be attributed to the absence of CLSEHC from the model. It is possible that CLSEHC is a significant explanatory variable and, in fact, the evidence in **Tables 5 and 6** supports this possibility. For the Reluctant Companies, the six models explain over 50% of the variation in the dependent variable. Details of the coefficient attributed to each independent variable and their significance are shown in **Table 5**.

The relative importance of the relationship between each independent variable and the dependent variable is determined by using the standardised regression coefficient (that is, the beta coefficient: see Norusis, 1983, p.156) to rank the independent variables. Provided the independent variables are relatively orthogonal, this is an effective way of determining their relative importance. The ranking by the beta analysis

Table 5: Coefficients between the dependent and independent variables

Supportive Companies

	CLSEHC	CCADJBV	EARNHC	CCADJE	DIV
BMP1	.989**	-.776**	.583	.592	-.353
BMP2	1.221**	-.756**	1.273	.166	-1.519
D1BMP1	.753**	-.767**	2.744**	1.178	-.389
D1BMP2	.826**	-.467	4.398**	.388	-.877
D2BMP1		-.254	4.840**	.337	-.006
D2BMP2		.473*	6.130**	-.394	-1.106

Reluctant Companies

	CLSEHC	CCADJBV	EARNHC	CCADJE	DIV
BMP1	.564**	.733*	-.309	-.617	4.202**
BMP2	.322*	.480	-.058	-1.143	13.536**
D1BMP1	.422**	.178	3.353**	.718	3.064**
D1BMP2	.635**	.199	2.535**	1.706*	6.008**
D2BMP1		.529**	5.110**	.010	2.007*
D2BMP2		.877**	3.875**	.763	6.383**

*Note: * denotes variables which are significant at the 5% level of significance and ** denotes variables which are significant at the 1% level of significance*

was verified by reference to the part and partial correlation analysis. The rankings by these measures for each of the models for the two groups of companies are given in **Table 6**.

Table 6 shows inconsistencies between the three ranking measures. An examination of the models indicates a high level of inter-correlation between some of the independent variables. Despite this situation, some evidence on the importance of the independent variables can be observed from examining **Table 6**.

The analysis now focuses on each independent variable and on the models in which the variables are significant. Particular attention is paid to the direction of the relationship between the dependent and independent variables (as revealed in **Table 5**) and the relative importance of the independent variables (as revealed in **Table 6**).

Table 6: Examining the relative importance of the independent variables

Models

Supportive Companies

	BMP1	BMP2	D1BMP1	D1BMP2	D2BMP1	D2BMP2	AVGE RANK
Variables	A B C	A B C	A B C	A B C	A B C	A B C	
CLSEHC	1 1 1	1 1 1	1 1 1	1 1 1			1.00
CCADJBV	2 2 2	2 2 2	3 2 2	3 3 3	2 2 2	2 2 2	2.22
EARNHC	3 4 4	3 3 3	2 3 3	2 2 2	1 1 1	1 1 1	2.22
CCADJE	4 3 3	5 5 5	5 5 5	5 5 5	3 3 3	3 3 3	4.05
DIV	5 5 5	4 4 4	6 6 6	6 6 6	4 4 4	4 4 4	4.83
1/DEFLATOR			4 4 4	4 4 4			

Reluctant Companies

	BMP1	BMP2	D1BMP1	D1BMP2	D2BMP1	D2BMP2	AVGE RANK
Variables	A B C	A B C	A B C	A B C	A B C	A B C	
CLSEHC	1 2 2	2 2 2	2 3 3	1 1 1			1.83
CCADJBV	2 3 3	3 4 4	6 6 6	6 6 6	2 2 2	2 3 3	3.83
EARNHC	5 5 5	5 5 5	1 1 1	2 3 3	1 1 1	1 1 1	2.61
CCADJE	4 4 4	4 3 3	4 5 5	4 4 4	4 4 4	4 4 4	4.00
DIV	3 1 1	1 1 1	3 2 2	3 2 2	3 3 3	3 2 2	2.11
1/DEFLATOR			5 4 4	5 5 5			

A = Ranking by beta coefficient
B = Ranking by part correlation coefficient
C = Ranking by partial correlation coefficient

CLSEHC

For both groups of companies, CLSEHC is the most significant explanatory variable in each of the models. Thus, the major explanatory variable for a company's value is consistent across the two groups of companies. **Table 5** shows a positive relationship between this variable and the dependent

variable in each model. This appears reasonable. Ohlson (1989) described book value as an anchor in the valuation of a company.

CCADJBV

Supportive Companies

CCADJBV which measures cumulative unrealised holding gains is significant in four of the six models (see **Table 5**). Overall, it is ranked joint second (see **Table 6**). A negative relationship between this variable and the dependent variable is observed in three of the models and a positive relationship in the fourth model. To assess the reasonableness of this result, the findings from the individual models are considered.

A negative relationship is revealed for the basic models for both periods and the basic model deflated by Sales in period 1. The simple correlation coefficient shows a positive relationship between CCADJBV and company value for each of the models. The switch in the sign may be caused by severe multicollinearity, as all these models include the variable CLSEHC and an examination of the simple correlation coefficient reveals a very high correlation between CCADJBV and CLSEHC. Thus, it is possible that the incremental influence of CCADJBV on company value is negative. The reasonableness of this possibility is now considered.

Following Revsine's (1973) reasoning, a negative relationship between input price changes and operating cash flows may exist for some firms. Where firms are not in a position to pass on price increases, holding gains are regarded in a negative light. Evidence of this situation was observed by Hopwood and Schaefer (1989). Thus, the findings in the present study suggest that the Supportive Companies may have been unable to pass on price increases, so a negative relationship may be valid.

The basic model deflated by CLSEHC in period 2 is the only model which shows a significant positive correlation between CCADJBV and company value. In this model there is no evidence of a multicollinearity problem and the simple correlation coefficient is positive. However, the model excludes the variable CLSEHC and therefore it is possible that CCADJBV may be measuring not just cumulative unrealised holding gains but also reflecting the value of the company's net assets. As the relationship is positive, this suggests that the latter influence is stronger in the valuation model.

Reluctant Companies
CCADJBV is found to be significant in three (that is, BMP1, D2BMP1, D2BMP2) of the six models, and it has a positive coefficient in all three models (see **Table 5**). Furthermore, multicollinearity appears to be a problem in only the basic model for period 1, which is the only model which includes CLSEHC. **Table 6** shows that CCADJBV is ranked fourth in the list of variables.

Based on earlier comments, a positive relationship is reasonable. It is possible that the Reluctant Companies may have viewed cumulative unrealised holding gains in a positive light. Revsine's (1973) reasoning suggests that, where companies can respond positively to price increases, holding gains may reflect increased future operating cash flows.

In the case of both the Supportive and Reluctant Companies, it is not possible to determine the extent to which a company's ability to respond to price changes explains the direction of the relationship between CCADJBV and company value, as this study did not isolate a company's ability to respond to price changes. The importance of undertaking such a step should be borne in mind in future research studies.

EARNHC

For both the Supportive and Reluctant Companies, EARNHC is significant in four of the six models (see **Table 5**). It is ranked joint second for the Supportive Companies and third for the Reluctant Companies (see **Table 6**). The variable is significant in the deflated basic models for both periods for both groups. These models show a positive association between EARNHC and the dependent variable. Numerous other research studies provide evidence of a positive association between accounting earnings and company values. These studies are based on the premise that accounting earnings are useful in predicting cash flows (see Watts and Zimmerman, 1986, pp. 65-66).

CCADJE

Table 5 shows that CCADJE, which measures periodic unrealised holding gains, is not significant in any of the models for the Supportive Companies and the variable is ranked fourth (see **Table 6**). For the Reluctant Companies the variable is significant in the basic model deflated by Sales for period 2 (see **Table 5**) and it is ranked last. This model shows no

evidence of severe multicollinearity and a positive association is observed between the dependent and independent variable. This accords with the evidence discussed previously for Reluctant Companies relating to cumulative unrealised holding gains.

DIV

In accordance with Ohlson (1989), the DIV variable is defined as dividends for ordinary shareholders net of capital contributions.

Viewing DIV from Ohlson's (1989) perspective, a negative relationship between DIV and company value would be predicted. According to Ohlson, an increase in current dividends would reduce future earnings as the earnings base of the company would be reduced. Following Ohlson's reasoning, new capital increases book values, which results in an increase in the company's earnings potential and so new capital (negative dividends) would be positively correlated with company value.

However, other research studies, such as Aharony and Itzhak (1980), Asquith and Mullins (1983), Brickley (1983) and Dielman and Oppenheimer (1984), which focused on the relationship between cash dividends and share returns, found a positive association between the variables. Tisshaw (1982), in his valuation study, found a positive association between dividends and share values. These findings can be explained by investors viewing dividends as a return on their investment. In addition, Tisshaw (1982, p.159) asserted that investors have a preference for immediate income due to their desire to reduce uncertainty. Furthermore, Foster (1986, p. 388) commented that a positive association is consistent with the capital market using dividend releases as a positive signal from management about the future earnings prospects of the company. The latter comments suggest that increases in cash dividends would be viewed favourably by the capital market. This conflicts with Ohlson's views.

An examination of **Table 5** shows that for the Supportive Companies, the DIV variable is insignificant in all models and it is ranked last (see **Table 6**).

In the case of the Reluctant Companies, DIV is a significant variable in all models (see **Table 5**) and **Table 6** shows that, overall, it ranks second. All the models show a positive relationship between DIV and company value. An examination of the simple correlation coefficient supports this positive relationship.

The earlier analysis of **Table 5** indicates that EARNHC is less significant to the Reluctant Companies than to the Supportive Companies. Hence, for the former group of companies, it is possible that, empirically, DIV is capturing an income effect normally associated with the earnings variable. In this instance a positive relationship between DIV and company value would not be unreasonable.

INTERPRETING THE RESULTS

For ten of the 12 models derived, over 50% of the variation in the dependent variable was explained. This suggests that the independent variables included in Ohlson's model reflect characteristics which investors consider relevant in valuing a company. The historical cost value of closing shareholders' equity (CLSEHC) is the most significant explanatory variable, followed by historical cost earnings (EARNHC) for the Supportive Companies and dividends (DIV) for the Reluctant Companies. Thus, for both groups a stocks and a flow measure are value relevant. This implies that both balance sheet items and income statement variables are useful in assessing future cash flows; this concurs with the views of Brennan and Schwartz (1982a, 1982b), Ohlson (1989), Ou and Penman (1989) and Brennan (1991).

This study sought to provide evidence on the IEP of inflation accounting data. The balance of evidence from the models analysed suggests that the inflation accounting variables studied have IEP. In particular, the variable measuring cumulative unrealised holding gains (CCADJBV) is significant in seven of the 12 models derived. This suggests that information on holding gains is relevant to investors' information needs.

The variable (CCADJE) measuring periodic unrealised holding gains is significant in only one of the models. The poorer performance of periodic unrealised holding gains may be caused by considerable 'noise' in the measurement of periodic unrealised holding gains. The effect of measurement errors may be diminished over cumulative periods, thereby making cumulative unrealised holding gains a more reliable measure. For example, in a single period, under/over estimation of the effects of price changes may prevent the estimates from being used, while over a number of periods less than perfect correlation between the estimation errors over time would lead to the estimation errors being randomised, and, therefore, the utility of the cumulative measures could be improved.

The evidence supporting the utility of cumulative unrealised holding

gains suggests that perhaps the FASB's (1986) decision to repeal SFAS 33, which required the mandatory disclosure of inflation accounting data, may have been premature.

Another objective of the study was to determine whether or not company policy towards the disclosure of inflation accounting data in the pre-mandatory period is associated with the explanatory power of these data. This was achieved by dividing the sample of companies into two groups: Supportive Companies and Reluctant Companies. The analysis shows that separate models are required for the two groups of companies. There is very little evidence showing a difference in the importance of the inflation accounting disclosures between the two groups. CCADJBV is significant in four of the six models for the Supportive Companies, but only in three of the six models for the Reluctant Companies (see **Table 5**). Also, CCADJBV is ranked one place higher for the Supportive Companies than the Reluctant Companies. CCADJE is significant in only one model for the Reluctant Companies; however, it receives a higher ranking for the Supportive Companies than the Reluctant Companies.

The direction of the relationship between the inflation accounting variables and company value is different for the two groups of companies. In general, for the Supportive Companies a negative relationship exists. In their studies, Beaver and Landsman (1983), Darnell and Skerratt (1989) and Bernard and Ruland (1991) also found evidence of a significant negative relationship between share values and the inflation accounting variables. This result is consistent with the Supportive Companies viewing holding gains in a negative light, as they may have been unable to pass on price increases. In addition, it implies that these companies should not include these gains in current income; instead the gains should be treated as a capital maintenance adjustment. Revsine (1973) asserted that 'the term income should be reserved for those instances in which an augmentation of operating flow potential has occurred' (p. 115).

If the Supportive Companies were unable to respond positively to price changes, this may account for their willingness to voluntarily disclose inflation accounting data. The companies may have hoped that by disclosing the impact of inflation on their performance they could justify the need for price increases (for example, where price controls applied), protect themselves against increased wage claims and create an awareness of their excess burden of tax.

For the Reluctant Companies, the inflation variables are positively

correlated with company value. Other studies by Beaver and Landsman (1983), Page (1984) and Bernard and Ruland (1991) found evidence of a significant positive association between share values and inflation accounting variables. This suggests that these companies may have been able to respond to price increases and so the holding gains reflect good news. Within Revsine's (1973) framework, the holding gains arising in the period could be included in the current income statement. Furthermore, these companies may have been reluctant to disclose the effect of inflation on their results in case it would lead to increased tax charges and increased wage and dividend demands.

A further objective of this study was to discover whether or not a learning lag exists in relation to inflation accounting data. When developing a standard on inflation accounting, both the FASB (1979) and the ASC (see Carsberg, 1984b, p. 1) recognised the possible existence of a learning process on the part of preparers and users. A number of researchers (Arbel and Jaggi, 1978; Soroosh Joo, 1982; Beaver and Landsman, 1983; and Appleyard and Strong, 1984) cited the existence of a learning lag as a possible reason for the poor results on the utility of inflation accounting data. From the analysis in this study there is no evidence supporting an improvement in the explanatory power of the inflation accounting variables in the second period.

CONCLUSIONS, IMPLICATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The results of this study reveal that separate models were required for the two groups of companies. This suggests an underlying difference in the determinants of company values for the Supportive and Reluctant Companies. The tests show that for both groups the HC value of shareholders' equity is the most value relevant variable, followed by a historical cost measure of income. This supports the relevance of both balance sheet and income statement measures in determining share values. In addition, some evidence is found supporting the utility of inflation accounting data to investors. This evidence is stronger for cumulative unrealised holding gains than for periodic unrealised holding gains.

Another finding which emerges is that the direction of the relationship between the inflation accounting variables and company value is not consistent across the two groups of companies. In general, a negative relationship is observed for the Supportive Companies and a positive relationship for the Reluctant Companies.

Observing differences in the companies' response to inflation accounting data has implications for future research studies. Studies which ignore these differences by indiscriminately grouping companies may be biased against detecting evidence supporting the utility of inflation accounting data. Diversity with respect to the effects of inflation means that future studies should use greater refinement in the classification of companies to effectively assess the utility of inflation accounting data. Furthermore, the findings from research studies investigating the reasons for the differential behaviour among companies with respect to inflation accounting data may be useful in classifying companies into more homogeneous groups. Developments in the area of positive accounting theory provides a framework for such research.

The tests did not reveal any evidence of a learning lag. It is possible that two test periods may have been too short a time span in which to capture a learning effect. However, in the case of the Supportive Companies, even though inflation accounting data had been available prior to the test periods, there is still no evidence of a learning effect. The absence of a learning effect may be viewed as supporting the efficient markets hypothesis.

This study also suggests that more evidence is required on the utility of cumulative inflation accounting measures. Prior studies have focused on single period inflation accounting adjustments and it is possible these adjustments may have been seriously distorted by measurement errors. The effect of these errors may be randomised over a number of periods, which may make the cumulative inflation accounting adjustments more reliable.

Finally, the limitations of the study must be considered. The study was confined to large UK listed companies and to two test periods. It was only concerned with assessing the utility of inflation accounting data to investors and, in particular, the utility of unrealised holding gains. The econometrical problems encountered in applying Ohlson's valuation model and their impact on the study's findings must also be borne in mind.

APPENDIX 1
DEFINITION OF THE ABBREVIATED MODEL TITLES

BMP1 = Ohlson's basic model for period 1

BMP2 = Ohlson's basic model for period 2

D1BMP1	=	Ohlson's basic model for period 1 deflated by Sales
D1BMP2	=	Ohlson's basic model for period 2 deflated by Sales
D2BMP1	=	Ohlson's basic model for period 1 deflated by CLSEHC
D2BMP2	=	Ohlson's basic model for period 2 deflated by CLSEHC

REFERENCES

Accounting Standards Committee (1980). *SSAP 16: Current Cost Accounting*, London: ASC.

Aharony, J. & Itzhak, S. (1980). "Quarterly Dividends and Earnings Announcements and Stockholders' Returns: An Empirical Analysis", *Journal of Finance*, March, pp. 1-12.

Appleyard, A.R. & Strong, N.C. (1984). "The Impact of SSAP 16 Current Cost Accounting Disclosures on Security Prices". In Carsberg, B.V. & Page, M. (eds.), *Current Cost Accounting: The Benefits and the Costs*, Vol. 3, pp. 235-244, London: Prentice-Hall & ICAEW.

Arbel, A. & Jaggi, B. (1978). "Impact of Replacement Cost Disclosures on Investors' Decisions in the United States", *International Journal of Accounting Education and Research*, Vol. 14, Autumn, pp. 71-82.

Archer, G.S.H. & Steele, A. (1984). "The Implementation of SSAP 16, Current Cost Accounting, by UK listed companies". In Carsberg, B.V. & Page, M. (eds.), *Current Cost Accounting: The Benefits and the Costs*, Vol. 4, pp. 349-484, London: Prentice-Hall & ICAEW.

Asquith P. & Mullins, D.N. (1983). "The Impact of Initiating Dividend Payments on Shareholders' Wealth", *The Journal of Business*, January, pp. 77-96.

Atiase, R.K. & Tse, S. (1986). "Stock Valuation Models and Accounting Information: A Review and Synthesis", *Journal of Accounting Literature*, Vol. 5, pp. 1-33.

Baran, A., Lakonishok, J. & Ofer, A.R. (1980). "The Information Content of General Price Level Adjusted Earnings: Some Empirical Evidence", *Accounting Review*, Vol. LV, No. 1, January, pp. 22-35.

Beaver, W.H., Christie, A.H. & Griffin, P.A. (1980). "The information content of SEC accounting series release No. 190", *Journal of Accounting and Economics*, No. 2, August, pp. 127-157.

Beaver, W. H., Griffin, P.A. & Landsman, W.R. (1982). "The Incremental Information Content of Replacement Cost Earnings", *Journal of Accounting and Economics*, No. 4, pp. 15-39.

Beaver, W.H. & Landsman, W.R. (1983). *Incremental Information*

Content of Statement 33 Disclosures, Stamford, CT: FASB.
Bernard, V.L. & Ruland, R.G. (1987). "The Incremental Information Content of Historical Cost and Current Cost Income Numbers: Time-Series Analyses for 1962-1980", *Accounting Review*, Vol. LXII, October, pp. 707-722.
Bernard, V.L. & Ruland, R.G. (1991). "The Incremental Information Content of Historical Cost and Current Cost Income: Cross-Sectional Analysis for 1961-1980", *Advances in Quantitative Analysis of Finance and Accounting*, Vol. 1, Part B, pp. 55-65.
Board, J.G. & Walker, M. (1985). "Information Content of SSAP 16 Earnings Changes", *Accounting and Business Research*, Winter, pp. 69-72.
Brayshaw, R.E. & Miro, A.R. (1985). "The Information Content of Inflation-Adjusted Financial Statements", *Journal of Business and Accounting*, Vol. 12, Summer, pp. 249-261.
Brennan, M. (1991). "A Perspective on Accounting and Stock Prices", *Accounting Review*, January, pp. 67-79.
Brennan, M. & Schwartz, E.S. (1982a). "Consistent Regulatory Policy Under Uncertainty", *The Bell Journal of Economics*, Vol. 13, Autumn, pp. 506-521.
Brennan, M. & Schwartz, E.S. (1982b). "Regulation and Corporate Investment Policy", *Journal of Finance*, Vol. 37, May, pp. 289-300.
Brickley, J. A. (1983). "Shareholder Wealth, Information Signalling and the Specially Designated Dividend", *Journal of Financial Economics*, August, pp. 187-209.
Bublitz, B., Frecka, T. J. & McKeown, J.C. (1985). "Market Association Tests and FASB Statement No. 33 Disclosures: A Re-examination", supplement to *Journal of Accounting Research*, Vol. 23, pp. 1-25.
Carsberg, B.V. (1984a). "The Reliability of Special Current Cost Measurements", in Carsberg, B.V. & Page, M. (eds.), *Current Cost Accounting: The Benefits and the Costs*, Vol. 2, pp. 129-147, London: Prentice-Hall & ICAEW.
Carsberg, B.V. (1984b). " The Usefulness of Current Cost Accounting: A Report on a Research Programme". In Carsberg, B.V. & Page, M. (eds.), *Current Cost Accounting: The Benefits and the Costs*, Vol. 1, pp. 1-70, London: Prentice-Hall & ICAEW.
Cooper, T. (1980). "Replacement Cost and Beta: A Financial Model", *Journal of Accounting, Auditing and Finance*, Vol. 3, No. 2, pp. 138-146.
Darnell, A.C. & Skerratt, L.C.L. (1989). "The Valuation Approach to Stock Market Impact: Some Tests With (Current Cost Accounting) Disclosures", *Accounting and Business Research*, Vol. 19, No. 74, pp. 125-134.
Dielman, T.E. & Oppenheimer, H.R. (1984). "An Examination of Investor

Behaviour During Periods of Large Dividend Changes", *Journal of Financial and Quantitative Analysis*, June, pp. 197-216.
Edwards, E.O. & Bell, P.W. (1961). *The Theory and Measurement of Business Income,* Berkeley, CA: University of California Press.
Freeman, R.N., Ohlson, J.A. & Penman, S.H. (1982). "Book Rates of Return and Prediction of Earnings Changes: An Empirical Investigation", *Journal of Accounting Research*, Vol. 20, pp. 85-107.
Financial Accounting Standards Board (1979). *SFAS 33: Financial Reporting and Changing Prices*, Stamford, CT: FASB.
Financial Accounting Standards Board (1986). *SFAS 89: Financial Reporting and Changing Prices*, Stamford, CT: FASB.
Foster, G. (1986). *Financial Statement Analysis*, Englewood Cliffs, N.J.: Prentice-Hall.
Gonedes, N.J. & Dopuch, D. (1974). "Capital Market Equilibrium, Information Production and Selecting Accounting Techniques: Theoretical Framework and Review of Empirical Work", in *Studies on Financial Accounting Objectives*, supplement to *Journal of Accounting Research*, Vol. 12, pp. 48-169.
Harris, T. & Ohlson, J.A. (1987). "Accounting Disclosures and the Market's Valuation of Oil and Gas Properties", *Accounting Review*, Vol. 62, pp. 651-670.
Hopwood, W. & Schaefer, T. (1989). "Firm-Specific Responsiveness to Input Price Changes and the Incremental Information in Current Cost Income", *Accounting Review*, Vol. LXIV, April, pp. 313-328.
Kam, V. (1990). *Accounting Theory*, New York: John Wiley & Sons.
Lev, B. & Ohlson, J. A. (1982). "Market-Based Empirical Research in Accounting: A Review, Interpretation and Extension", *Studies on Current Research Methodologies in Accounting: A Critical Evaluation*, supplement to *Journal of Accounting Research*, pp. 249-322.
Lobo, G.J. & Song, I. (1989). "The Incremental Information in SFAS No. 33 Income Disclosures over Historical Cost Income and its Cash and Accrual Components", *Accounting Review*, Vol. LXIV, April, pp. 329-343.
Matolcsy, Z.P. (1984). "Evidence on the Joint and Marginal Information Content of Inflation-Adjusted Accounting Income Numbers", *Journal of Accounting Research*, Vol. 22, Autumn, pp. 555-569.
Murdoch, B. (1986). "The Information Content of FAS 33 Returns on Equity", *Accounting Review*, Vol. LXI, April, pp. 273-287.
Norusis, M.J. (1983). *Spssx Introductory Statistics Guide*, New York: McGraw-Hill.
Nunthirapakorn, T. & Millar, J.A. (1987). "Changing Prices, Accounting Earnings and Systematic Risk", *Journal of Business Finance and Accounting*, Vol. 14, Spring, pp. 1-25.

Ohlson, J.A. (1989). "Accounting Earnings, Book Value, and Dividends: The Theory of the Clean Surplus Equation (Part 1)", unpublished working paper, New York: Columbia University.
Ou, J.A. & Penman, S.H. (1989). "Financial Statement Analysis and the Prediction of Stock Returns", *Journal of Accounting and Economics*, pp. 295-329.
Page, M. (1984). "The Availability of Data for Current Cost Accounting". In Carsberg, B.V. & Page, M. (eds.), *Current Cost Accounting: The Benefits and Costs*, Vol. 2, pp. 195-216, London: Prentice-Hall & ICAEW.
Prakash, P. & Sunder, S. (1979). "The Case Against Separation of Current Operating Profit and Holding Gain", *Accounting Review*, Vol. 54, January, pp. 1-22.
Revsine, L. (1973). *Replacement Cost Accounting*, Englewood Cliffs, NJ: Prentice-Hall.
Revsine, L. & Weygandt, J.J. (1974). "Accounting for Inflation: The Controversy", *Journal of Accountancy*, October, pp. 72-78.
Ro, B.T. (1980). "The Adjustment of Security Returns to the Disclosure of Replacement Cost Accounting Information", *Journal Of Accounting and Economics*, No. 2, pp. 159-189.
Short, D. (1978). "The Impact of Price-Level Adjustment in the Context of Risk Assessment", supplement to *Journal of Accounting Research*, Vol. 16, pp. 259-272.
Soorosh Joo, J. (1982). *An Empirical Evaluation of FASB 33 Financial Reporting and Changing Prices*, Ann Arbor, Michigan: UMI Research Press.
Tisshaw, H.J. (1982). "A Study into the Relationship Between Accounting Information and Share Prices", unpublished Ph.D. dissertation, City University London.
Watts, R.L. & Zimmerman, J.L. (1986). *Positive Accounting Theory*, Englewood Cliffs, NJ: Prentice-Hall.