EXTRAORDINARY ITEMS AND INCOME SMOOTHING: A POSITIVE ACCOUNTING APPROACH

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INTRODUCTION

Positive accounting theory has made a significant contribution to our understanding of corporate reporting practices. In particular, it has provided an explanation of managers' choice among accounting methods and has established the existence of incentives for earnings management. Managers' choice of accounting method is explained in terms of the underlying trade-off between these various incentives.

To date, positive accounting theory has generally been tested on *accounting method choices*, with only one study of this type, conducted by Moses (1987), focusing on income smoothing behaviour. The scope which currently exists under UK reporting regulations for significant *classificatory choices* using extraordinary items provides a new managerial choice context in which positive accounting theory can be tested. In the UK, 53 per cent of a sample of 700 companies are currently reporting extraordinary items (Financial Reporting Council, 1991).

A basic assumption in positive accounting theory is that agents are rational individuals concerned with furthering their own self-interest. Consistent with this we assume that the motivating factor influencing managers' selection of particular accounting policies is the maximisation of their utility. The motivation for accounting policy choice studies is to gather evidence about the factors which influence managerial action. The accumulation of evidence from accounting policy choice studies facilitates the development of a theory to explain accounting practice.

The existing empirical literature on extraordinary items has examined the use of alternative classifications for such items in the smoothing of accounting

income numbers. These studies have focused on the statistical and time series properties of the accounting numbers without reference to any underlying economic rationale. The present study is the first income smoothing study to examine classificatory choices within an explicit, incentives-based framework. The results obtained will provide an insight into the general applicability of positive accounting theory by evaluating its explanatory power in a hithero untested choice situation.

The assumed object of smoothing in this study is the reported profit after tax, but *before* extraordinary items. This is chosen because, under UK GAAP, it provides the basis for the calculation of the earnings per share figure, a statistic regarded by many as a key financial ratio. The instrument of smoothing which we examine is the classification of items either above the line (i.e. exceptional items) or below the line (i.e. extraordinary items). In this study, we refer to exceptional and extraordinary items as *discretionary classification items* (DCIs). The existence of flexibility in the treatment of similar items provides management with the opportunity to smooth earnings. The revision to *SSAP6 Extraordinary Items and Prior Year Adjustments* in 1986 was an attempt to reduce the variety of accounting practice in this area. Despite this, the Accounting Standards Board has recently stated that 'the inadequacy in the present structure of the profit and loss account stems from the variety of treatments of extraordinary items' (ASB, 1991, p. 1).

DCIs display the characteristics of an effective smoothing instrument (Copeland, 1968; and Beidleman, 1973). We will show that in UK financial reporting they occur frequently and are of significant magnitude. Moreover, the classificatory choice does not commit management to any future actions, although the choice may be constrained to some extent by custom and practice. A further benefit to the researcher is that the effect of alternative classifications of DCIs may be quantified. This allows us to develop a measure of smoothing which is finer than the dichotomous measure generally used in prior studies.

The remainder of this paper is structured as follows. In the next section we (i) define earnings management, (ii) review positive accounting theory, which provides the general theoretical framework for this study, (iii) discuss the relationship, within this framework, between the accounting choice, earnings management and income smoothing literatures, and (iv) develop our model and hypotheses. In the third section we describe our measure of smoothing and detail our sample and methods. The fourth section contains results and discussion. The final section presents the conclusions.

LITERATURE REVIEW AND MODEL DEVELOPMENT

Definition

Earnings management has been defined as 'a process of taking deliberate steps within the constraints of generally accepted accounting principles to bring about

a desired level of reported earnings' (Davidson et al., 1987). A specific example of earnings management included within this definition is income smoothing. Smoothing can be viewed in terms of the reduction in earnings variability over a number of periods, or, within a single period, as the movement towards an expected level of reported earnings. It should be noted that this definition relates, in the context of this study, to 'artificial' earnings management, which encompasses both changes in accounting methods and classificatory choice.

Literature Review

The intellectual antecedent of positive accounting theory is the income smoothing hypothesis proposed by Gordon (1964). Within his framework, income smoothing emerges as rational behaviour based on the assumptions that (i) managers act to maximise their utility, (ii) fluctuations in income and the unpredictability of earnings are causal determinants of market risk measures, (iii) the dividend payout ratio is a causal determinant of share values, and (iv) managers' utility depends on the firm's share value (Beidleman, 1973; and Watts and Zimmerman, 1986, p. 134).

This literature implicitly assumes that the market is inefficient, i.e. that the market relies on bottom line accounting numbers without regard to the procedures used to generate them.[1] It is, however, not necessary for the stock market's price formation process to exhibit functional fixation in order to establish smoothing incentives; it is sufficient for claimholders to exhibit bounded rationality. Alternatively, it is sufficient for management to *believe* that the market relies on accounting numbers. A questionnaire study by Mayer-Sommer (1979) found that 83 per cent of Fortune 500 controllers rejected the idea of market efficiency. Managers may, however, have incentives to misrepresent their beliefs, especially to standard setters. Using an approach which controls for this, O'Keefe and Soloman's (1985) investigation of managers' comment letters to FASB provides further evidence that many managers do not believe in market efficiency. In all cases, *ceteris paribus*, the higher the variability of the firm's earnings, the stronger the incentive for management to smooth income.

The early empirical income smoothing studies were time-series studies which viewed smoothing as an exercise in the reduction of long-run earnings variability. Their objective was to establish whether the observed time-series of earnings was consistent with smoothing. Incentives to smooth were not explicitly considered. In general, findings did indicate the existence of smoothing (for a summary see Ronen and Sadan, 1981). Two recent empirical studies document further instances of smoothing from a multi-period perspective (Ma, 1988; and Brayshaw and Eldin, 1989).

In contrast to the early income smoothing literature, positive accounting theory, associated with Watts and Zimmerman (1986), assumes market efficiency. In this context the market will see through observable smoothing

devices such as classificatory choice. However, by introducing positive contracting costs, alternative incentive rationales for earnings management are generated. Holthausen (1990) identifies three overlapping perspectives on accounting choice: the opportunistic behaviour, efficient contracting and information perspectives. The two contracting perspectives (efficient contracting and opportunistic behaviour) are based on the existence of contracts which rely on accounting numbers.

In the opportunistic behaviour setting, managers are assumed to maximise their own wealth, which depends upon performance-related cash bonuses, employment risk arising from the possibility of company failure or takeover, and the firm's share value. The share value wealth effects result from managers' holdings of shares and share options, and through the effect on the value of their human capital. It follows, therefore, that managers have incentives to make choices which maximise the firm's direct cash flows and hence firm value. Managerial incentives also arise where accounting choices do not have a direct cash flow effect. This occurs, for example, where accounting choices impact on share prices via their effect on the firm's expected political costs (a function of reported profits) or debt default/renegotiation costs. Thus it is predicted that, *ceteris paribus*, the managers of firms with high political costs will select current income-reducing accounting methods and that the managers of firms with high agency costs of equity and debt will choose current income-increasing methods. Most empirical work is based on the opportunistic behaviour hypothesis.

In the efficient contracting setting, contracts which minimise agency costs may encourage earnings management. The contracts are, nevertheless, efficient as they result in firm value maximisation. In practice it is difficult to distinguish hypotheses based on this perspective from those generated in the opportunistic behaviour setting.

The information perspective has been explored in recent analytical work, although testable implications have not yet been generated. This branch of the literature explicitly identifies income smoothing as an earnings management strategy (for a review see Schipper, 1989). Based on the fundamental assumption of information asymmetry between managers and actual (and potential) claimholders, this approach establishes why the existence of such discretion to smooth can be in the best interests of the existing shareholders. This benefit arises, for example, by enhancing potential shareholders' perceptions of firm value (Dye, 1988), or by reducing the perceived level of bankruptcy risk, thus increasing firm value (Trueman and Titman, 1988). This perspective suggests that accounting methods are chosen to reveal managers' expectations about the future cash flows of the firm (Suh, 1990). Thus, for smoothing to be effective, managers' accounting choices must be observable.

Positive accounting theory has most commonly been tested using studies of accounting method choices. Christie (1990), in a synthesis of the empirical evidence, concluded that six proxies have explanatory power across a range of studies: size, risk, managerial compensation, leverage, and constraints on

interest cover and dividend payout. In contrast, there are few income smoothing studies which attempt to explain the incidence of smoothing in terms of the range of firm-specific characteristics relating to incentives. Early studies, drawing on managerial theories of the firm, argued that the separation of ownership from control increases the probability of smoothing behaviour. A number of reasons for this relationship have been offered. First, whilst controlling outside owners have direct access to the firm and do not need to rely on published information for their predictions (Kamin, 1975, p. iv), managers of firms with diffuse share ownership will be more likely to engage in smoothing to reduce the information asymmetries. Second, these managers will be more likely to engage in smoothing to reduce their undiversifiable employment risk and generally enhance the value of their human capital (Amihud et al., 1983). Third, the existence of managerial bonus plans with upper and lower bounds based on accounting numbers creates a conflict of interest between managers and shareholders. By smoothing, managers can effect a transfer of wealth from shareholders to themselves. In general, empirical studies have confirmed that smoothing is positively associated with management-controlled firms (Smith, 1976; Kamin and Ronen, 1978; and Amihud et al., 1983). Despite this, many recent accounting choice studies have failed to recognise the potential importance of ownership structure (Hunt and Hogler, 1990, pp. 57–59).

Other studies have investigated firm-specific motives for income smoothing from wider, external perspectives. Belkaoui and Picur (1984) draw on theories of economic duality to argue that firms in peripheral sectors have greater incentives to smooth than firms in core sectors. Firms are classified as operating in either core or peripheral sectors on the basis of capital intensity, unionisation, asset size and market characteristics. Their empirical results offer weak support for such an argument, suggesting that firms in peripheral sectors face a more restricted opportunity structure and a higher degree of environmental uncertainty. Craig and Walsh (1989) argue that the higher a firm's potential political costs, earnings variability and market risk, the stronger managers' incentives to smooth income by the use of extraordinary items. Their findings, however, support only the political cost hypothesis.

To our knowledge, the only smoothing study which explicitly adopts a positive accounting theory framework is the single-period study by Moses (1987), of *accounting method changes* by US firms. Moses' findings provide support for explanatory variables proxying for political costs, the agency costs of equity and earnings variability. The present study is therefore the first income smoothing study to examine *classificatory choices* within an explicitly incentives-based framework.

Model

Based on this review of the literature, the model we test is of the following general form:

$$\text{smoothing index} = f(\text{accounting risk, market risk, agency costs, political costs, ownership structure, industry}).$$

Our prior expectations are now briefly outlined.

Accounting and market risk: drawing on the same literature reviewed in Moses (1987), we hypothesise a positive association between the smoothing of accounting earnings numbers and risk (both market and accounting). To the extent that smoothing can provide signals which enhance the accuracy of earnings forecasts, and given that unexpected earnings are positively associated with levels of systematic risk (Givoly and Lakonishok, 1983, quoted in Moses), it is argued that wealth-maximising managers would be anxious to smooth accounting earnings in order to maximise firm value. Similarly, Beidleman's (1973) argument that smoothing tends to reduce a firm's beta, suggests that managers of firms with high levels of market risk would have more incentive to smooth.

Accounting risk has been included in the model in addition to market risk for two reasons. First, Moses (1987), in the only prior smoothing study which adopts a positive accounting theory perspective, found this to be a significant explanatory variable. Second, in addition to the effect of systematic risk on the appropriate discount rate, total risk can have a negative effect on the firm's expected cash flows because the expected costs of financial distress are related to total risk (Shapiro and Titman, 1985).

Agency costs: three variables are used to proxy agency costs: dividend cover, gearing and managerial holdings of share options. We hypothesise a negative association between smoothing and dividend cover. Three arguments can be put forward to support such an association. First, by generating a more stable earnings stream, smoothing behaviour is deemed to support a higher level of dividends and hence a higher share price (Gordon, 1964). Second, smoothing reduces the probability of management having to cut dividends, an action usually associated with bad news and a negative share price response. Third, given the observed stability in dividend payout, smoothing reduces the expected transactions costs associated with the funding of an uncovered dividend (Rozeff, 1982). We hypothesise a positive relationship between smoothing behaviour and gearing. Given that gearing proxies closeness to financial ratio covenants in debt agreements, it follows that smoothing reduces the probability of breaching these covenants and hence reduces the expected costs of default and/or renegotiation. We therefore expect managers in more highly geared firms to undertake a greater degree of smoothing. We also hypothesise a positive relationship between smoothing and the level of managerial holdings of share options. This variable is a measure of the direct impact of any increases in share values (achieved by smoothing) on managers' wealth, and represents an important accounting choice variable which has been omitted in many previous studies (Watts and Zimmerman, 1990, p. 145).[2]

Political costs: the firm's level of sales is used to proxy for the potential

political costs, borne by the firm, arising from the impact of external groups on the firm's activities. Such costs can arise in a number of ways: the impact of a regulatory directive, the impact of the firm having to pursue non-profit maximising behaviour and the cost of lobbying. This external intervention might be motivated by the firm's supply of politically sensitive goods and services (Sutton, 1988) or the potential exercise of monopoly power (Watts and Zimmerman, 1986). Given that large unexpected earnings fluctuations can attract the attention of government regulators and/or the public, we hypothesise a positive association between political visibility and smoothing behaviour, motivated by management's wish to minimise the expected costs of potential external intervention.

Ownership structure: we hypothesise that smoothing is negatively associated with the degree of outside ownership concentration. This tests the early smoothing studies' argument that the incentive to smooth is largely confined to firms with diffuse share ownership, i.e. manager-controlled firms. It has become clear, however, that a single variable may not capture the full effects of ownership structure, especially the impact of significant managerial ownership (Hunt, 1986). To overcome this possible limitation, we therefore also include a managerial ownership variable which captures two offsetting effects. First, as managerial ownership increases, the incentives of managers and outside shareholders become more closely aligned (Niehaus, 1989), and there is less incentive for wealth transferring activities. This suggests a negative association between smoothing and the level of managerial ownership. Second, however, as managerial ownership increases, the managerial labour market and the market for corporate control become less effective means by which managers are forced towards value-maximising decisions. This is because a manager who owns a significant proportion of the firm's equity often has sufficient voting power to guarantee future employment (Morck et al., 1988, p. 294). In the face of managerial incentives to smooth, an increase in managerial discretion can be expected to result in greater smoothing. The direct wealth effects of any increases in share values (achieved by smoothing) are also suggestive of a positive association. *A priori*, it is not clear which effect will dominate.

Industry: industry sector dummies are included to control for any differential industry effects on smoothing incentives (Watts and Zimmerman, 1990, p. 145).

Table 1 summarises these predictions and gives details of the variable names and specific measures used.[3]

METHODS

Sample Selection

The initial sample comprises the 300 companies in the 1989—90 survey of UK published accounts (ICAEW, 1990). Of these, 49 companies were excluded because they did not report any DCIs, and a further 23 were eliminated at this

Table 1

Description of Variables and Proxies

Variable	Variable Name (predicted sign)	Calculation
Accounting risk	EVAR (+)	$\frac{1}{3}\sum_{k=1}^{3}\left|\frac{RE_{t-k} - EE_{t-k}}{sales_{t-k}}\right|$ (where EE is based on the simple random walk expectations measure)
Market risk	BETA (+)	As at July 1988 — LBS Risk Measurement Service
	DIVCOV (−)	$\dfrac{\text{Profit before extraordinary items}_t}{\text{Ordinary dividends paid and proposed}_t}$
Agency costs	CAPGEAR (+)	Capital gearing % — Datastream item no. 731
	PEROPT (+)	Number of outstanding ordinary share options (including saving-related) held by directors as a percentage of the number of ordinary shares in issue
Political costs	SALES (+)	Datastream item no. 104
Ownership structure	OOC1 (−)	Largest single outside shareholding % (Note)
	MOSQ (?)	Beneficial shareholding of directors $\%^2$
Industry	D1–D4: (?)	Dummy variables for four out of five different industry categories that best describe a particular firm, formed by combining FTA industry groupings:
	D1	industrials
	D2	leisure and consumer
	D3	electronic and engineering
	D4	commodities
		The fifth group is financials

Note:
Individual holdings under five per cent are not required to be disclosed and are therefore not captured in this measure.

stage due to large blocks of missing data, leaving 228 observations. We did not exclude all observations with missing data at this stage, since it was possible that certain proxy variables with missing values would not be selected for inclusion in the final model specification. Missing data in the final variable set reduced the estimation sample size to 163.

Earnings Expectations Models

In the context of income smoothing, expected earnings are interpreted as management's *target* reported earnings, rather than the market's expectation. In the present study, we use two models. The first is a simple random walk model, where this year's expected earnings equals the prior year's reported earnings. The second model tested is a random walk with drift, where this year's expected earnings equals the prior year's reported earnings plus average earnings growth over the three preceding years. To the extent that performance-related bonus plans are linked to past earnings, these are suitable models of target reported earnings.

Smoothing Index

This index is based on information regarding DCIs, which we define as items separately disclosed in the profit and loss account for which there is no specific regulatory disclosure requirement. We define reported earnings (RE) as the reported profit after tax, but before extraordinary items. The variable (E_i) represents the potential earnings figures (after tax) given the number and magnitude of the DCIs and hence the classificatory earnings choices available to management. Thus, given n DCIs, the number of potential earnings figures that could be reported is 2^n. It should be noted that the earnings figure actually reported reflects the classificatory choice selected and is one of the E_i values. The expected earnings figure (EE) is calculated using the expectations models defined above.

Our *index of smoothing* is:

$$ SI = \frac{\max |E_i - EE| - |RE - EE|}{\max |E_i - EE| - \min |E_i - EE|}, $$

where $0 \leq SI \leq 1$.

The construction of this index is explained as follows. In the numerator, the term $\max |E_i - EE|$ is the maximum deviation from expected earnings that could have been achieved, while the term $|RE - EE|$ is the actual deviation from expected earnings. The difference between these terms therefore provides a measure of observed smoothing. In order to standardise this measure, we divide through by the *range of smoothing*. This is defined as the difference between the maximum potential deviation from expected earnings and minimum potential deviation from expected earnings.

Thus, at one extreme, if managers' classificatory choices result in reported earnings (RE) at the maximum deviation from expected earnings (EE), then the two terms of the numerator are equal, and hence the smoothing index takes a value of zero. At the other extreme, if reported earnings deviates a minimum amount from expected earnings (EE), then the numerator equals the denominator and the smoothing index takes a value of one. For firms with only one DCI, the smoothing index must, by definition, take a value of either one or zero. However, intermediate values of SI will occur where a firm has more than one DCI. A numerical example illustrating the calculation of SI is given in the Appendix.

This index thus partially overcomes the difficulty of measuring the *magnitude* of the effect of a change in accounting method on current reported income — a difficulty encountered in previous earnings management studies which focus on accounting method choice (Hagerman and Zmijewski, 1979, p. 149). Usually in these studies only the directional effect can be established and thus the dependent variable is dichotomous. In the present study we are able to estimate the earnings effect of alternative classificatory choices and this permits the development of a more precise dependent variable than the dichotomous measures normally employed.

Data Collection

In order to calculate the smoothing index, the profit and loss account and notes to the accounts in each company's annual report were scrutinised for DCIs. The nature of the items, their amounts and actual classifications were noted. As the object of smoothing is a post tax measure, it was necessary to estimate the post tax magnitude of those DCIs which were disclosed above the line. The tax effect was estimated at rates between 0 and 35 per cent, depending on the nature of the item, and an assessment of the firm's overall tax position. For each company, all potential reported earnings figures (E_i) were computed in order to identify max $|E_i - EE|$ and min $|E_i - EE|$, and hence calculate the smoothing index.

Data on the independent variables was obtained from three sources. Directors' share options and the number of ordinary shares in issue were extracted from the companies' annual report and accounts. The market risk measures were obtained from the LBS Risk Measurement Service. The remaining data was taken from Datastream, viz. sales (item 104), profit after tax, minorities, preference dividend, before extraordinary items (item 625), number of directors (item 242), number of non-executive directors (item 243), gross fixed assets (item 330), stock (item 360), payroll costs (item 117), capital gearing per cent (item 731), income gearing per cent (item 732), ordinary dividend (item 187), and ordinary share capital (item 301). In addition, we also obtained shareholder details (Program 130A), industry sales, and industry groupings (Level 4: FTA).

RESULTS

Dependent Variable

The 228 companies contained a total of 557 DCIs, comprising 96 items labelled as exceptional, 164 items separately disclosed above the line but not specifically labelled as exceptional, and 297 extraordinary items. The average number of DCIs per company is thus 2.4. The mean absolute size of these items (post tax) is £8.6 million, with the mean absolute size being one per cent of sales. The mean of the range of potential reported earnings, measured relative to expected earnings, is 0.64.[4] It is therefore clear that DCIs occur frequently and are of significant magnitude.

A categorisation framework comprising 24 categories was developed for the DCIs. Each DCI was allocated to one of these categories based upon the description of the item appearing in the annual report. It was apparent that the degree of classificatory discretion varied greatly between categories but was generally high. If p_j is defined as the proportion of items in category j classed as extraordinary, then of the 557 DCIs, 241 belonged to categories where classificatory discretion was judged to be high, i.e. $0.2 \leq p_j \leq 0.8$.

A frequency histogram of the smoothing index based on each of the earnings expectations models is shown in Figure 1. It can be seen that the smoothing index based on the simple random walk model is roughly symmetric, although as the values of the index are restricted to a finite range, the distribution is not normal, with the values bunching at zero and one.[5] The incorporation of a drift component increases the mean smoothing measure and results in a distribution which is skewed to the left.

Multivariate Regression

It is not appropriate to include all of the alternative proxy variables in our regression. Not only would many degrees of freedom be used up, but the model would be highly collinear. The method used to select the variable *proxy measures* was as follows. A series of OLS regressions were carried out which included all of the explanatory variables, but included only one of the alternative proxies in any one single regression. This procedure identified those proxies with the highest explanatory power — BETA, CAPGEAR, SALES, OOC1 and MOSQ — which were then used in all subsequent analysis. These are the proxy measures listed in Table 1. Details of the alternative proxy measures used are given in note 3.

Three diagnostic procedures were used to test the assumptions underlying the OLS linear regression model. First, we tested for the existence of collinearity among the explanatory variables. Since the examination of bivariate correlations will not identify collinearity caused by approximate linear combinations involving more than two regressors, we followed the diagnostic approach of Belsey, Kuh and Welsch (1980), using the COLLIN option available in SAS. This procedure identified one near dependency
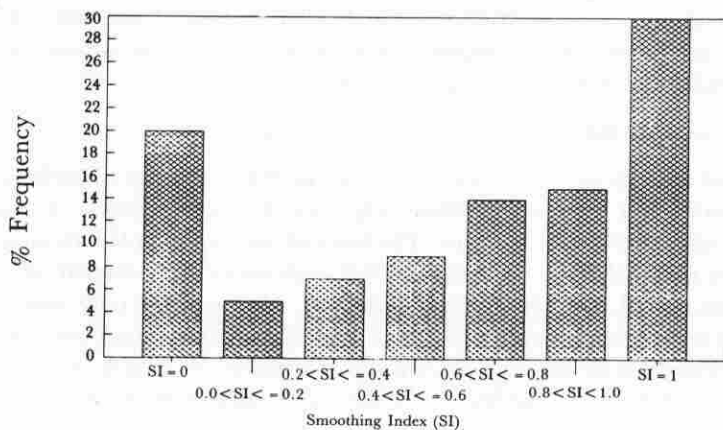
Figure 1

Smoothing Index Frequency Distribution

Panel A: Simple Random Walk Earnings Expectations Model

Smoothing Index (SI)
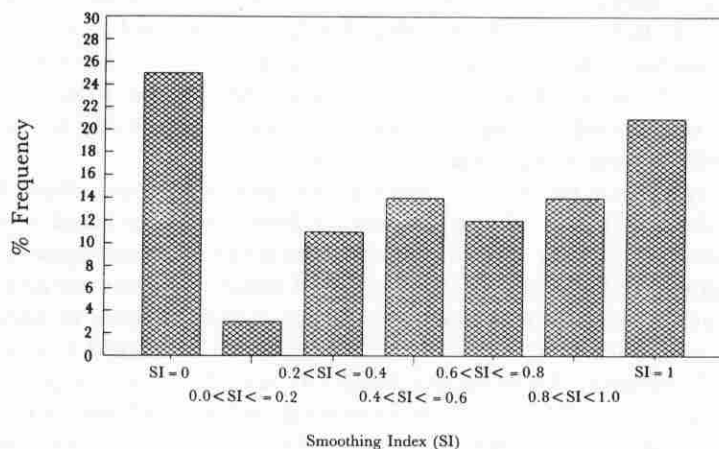
Panel B: Random Walk with Drift Earnings Expectations Model

Smoothing Index (SI)

involving the variables D1, D2 and D3. The problem was attributed to the very small number (three) of financial firms. We therefore combined these firms with the commodities firms by dropping the D4 dummy variable. This produced satisfactory collinearity diagnostics.

Second, it was clear from the descriptive statistics on the explanatory variables that many were highly skewed to the right. In order to reduce severe positive skew, a logarithmic transformation is appropriate with the addition of a constant where necessary (Tabachnick and Fidell, 1983). This procedure substantially

reduced the level of skew in the explanatory variables. However, the White test (produced using the SPEC option) indicated that heteroscedasticity remained a problem, resulting in unbiased but inefficient OLS estimators (White, 1980). This was to be expected, especially given the quasi-binary distribution of the dependent variable. An examination of the residual plots indicated those variables potentially causing the heteroscedasticity and its functional form. A series of Glejser tests were conducted and the variable DIVCOV was found to be associated with the heteroscedasticity. We therefore re-estimated the model using weighted least squares (WLS) (Maddala, 1977).

Third, influential data points were identified using the technique of single-row deletion proposed by Belsey, Kuh and Welsh (1980). Using the WLS regression results, an analysis of each observation's influence measures, in conjunction with the examination of the partial regression leverage plots, did reveal a number of highly influential observations. The underlying data for these observations was inspected for any unusual features. In the case of three companies, it was clear that all their DCIs fell into categories where the degree of classificatory discretion was very low. This provides some evidence that this is a potentially important control variable in the model. We have, however, found the development of an appropriately weighted summary measure of this variable to be problematic. In the absence of a suitable measure to include in the model, the appropriate action is to exclude any influential observation of this type. A further company was excluded because a partitioning variable used in further analysis was spuriously exaggerated.

The resultant WLS regression results using the simple random walk earnings expectations model are given in Table 2, column 1. Four variables are significant with the expected sign: EVAR and DIVCOV are significant at the one per cent level, while CAPGEAR is significant at the five per cent level, and OOC1 is significant at the ten per cent level. These levels of significance are based on two-tailed tests, since not all variables have a predicted sign. This will, however, understate the significance of the other variables. All other coefficient estimates show the predicted sign with the exception of BETA. The overall model is very significant ($p < 0.0001$), although its overall explanatory power is fairly low (adjusted R^2 = 0.17). These results are discussed below. The differential effect of using the alternative earnings expectations model, *viz.* random walk with drift, is not substantial and the results are not reported here.

Despite the fact that in the *aggregate*, DCIs have a material effect on the reported earnings of our sample companies, the effect of classificatory choices is marginal in some individual cases. In these circumstances, it is possible that the incentive to smooth is low. The magnitude of the range of potential earnings numbers, relative to target reported earnings, is captured by the variable SIRELRAN, defined as:

$$\text{SIRELRAN} = \frac{\max |E_i - EE| - \min |E_i - EE|}{|EE|}.$$

Table 2

WLS Regression Results: Dependent Variable is Smoothing Index
(*t*-statistics in parentheses below coefficients)

Variables (predicted sign)	(1) Full Sample	(2) Split Sample: SIRELAN ≥ Median Value
Intercept	0.672 (2.33)**	0.852 (2.73)***
EVAR (+)	3.847 (3.03)***	3.154 (2.70)***
BETA (+)	−0.200 (−1.23)	−0.188 (−0.77)
DIVCOV (−)	−0.075 (−4.33)***	−0.088 (−4.29)***
CAPGEAR (+)	0.005 (2.36)**	0.001 (0.51)
PEROPT (+)	0.077 (1.60)	0.124 (2.62)**
SALES (+)	8.95×10^{-10} (0.06)	1.6×10^{-8} (0.70)
OOC1 (−)	−0.006 (−1.67)*	−0.012 (−3.36)***
MOSQ (?)	−0.0001 (−0.90)	4×10^{-6} (0.02)
D1 (?)	−0.021 (−0.09)	0.012 (0.06)
D2 (?)	0.135 (0.58)	0.229 (1.19)
D3 (?)	0.020 (0.09)	−0.026 (−0.14)
Prob. > F (two-tailed)	0.0001	0.0001
R^2	0.23	0.44
$\bar{R}^2$	0.17	0.34
N	159	78

Notes:
Levels of significance (two-tailed tests):   *$p < 0.10$
     **$p < 0.05$
     ***$p < 0.01$.

We split the sample based on the median value of SIRELAN (0.192). We expected the base model to provide a better explanation for the observed level of

smoothing for companies where SIRELRAN was high. These expectations were confirmed (see Table 2, final column), with the adjusted R^2 rising to 0.34.

The detailed regression results for the split sample were similar in nature, yet stronger than for the full sample. EVAR and DIVCOV remain highly significant at the one per cent level. The significance of OOC1 now rises to the one per cent level and PEROPT becomes significant at the five per cent level. Curiously, CAPGEAR loses its significance. These results are discussed below.

Further analysis explored the relationship between smoothing and an alternative earnings management strategy — big bath accounting. Big bath behaviour is an earnings management strategy which is *inconsistent* with smoothing. A discussion of the managerial incentives which establish big bath accounting as rational, economic behaviour is provided by Strong and Meyer (1987). Big bath behaviour has traditionally been conceived of as reductions in reported earnings, but has recently been more generally defined in terms of outliers in the reported earnings time series (Walsh et al., 1991), a definition which also allows for increases.

Since the existence of big bath behaviour would confound our analysis, we attempted to identify and exclude those firms engaging in such behaviour. Our first approach was based on the uni-directional definition of big bath behaviour, and excluded the four observations where max $E_i < 0.7EE$ (a judgemental cutoff). Second, we also excluded thirty-eight observations where min $E_i > 1.3EE$, leaving a sample of 121. Neither procedure improved the overall significance or explanatory power of the model (although the results remained fairly stable) and therefore the results are not reported here. This suggests that big bath accounting is not present in sufficient strength to impair the explanatory power of the model.

Discussion

Across both samples, our results show four variables to be associated with classificatory choices consistent with smoothing behaviour. Smoothing is positively associated with earnings variability and managerial share options, and negatively associated with dividend cover and outside ownership concentration. The significance of earnings variability is not surprising since, from a managerial perspective, earnings variability is likely to be a more relevant risk measure than beta, since managers are likely to be unable to diversify their investment of human capital (Amihud and Lev, 1981). However, beta, which is of more relevance to shareholders, is not significant. This may be because shareholders are able to diversify away unsystematic risk and effect changes in the systematic risk of their portfolio by means other than smoothing.

The significance of the outside share ownership variable was shown by additional regression tests (not reported here) to be robust with respect to the inclusion of the second ownership structure variable, managerial ownership. Further, the lack of significance of managerial ownership is consistent with

Moses' (1987) failure to detect a relationship with ownership structure, measured using a *single* managerial ownership variable.

Differences emerged between the results obtained from the full sample and from the split sample (SIRELRAN high). In general, the significance of individual variables rose, reflecting the increased smoothing opportunities which were expected to exist in the split sample. The CAPGEAR coefficient, which was significant in the full sample, is however no longer significant in the split sample. We therefore investigated whether this loss of significance derived from a spurious correlation between gearing and SIRELRAN in the full sample. Instabilities of this type can arise where the sample comprises two sub-samples in which the means of the dependent and the relevant independent variable are significantly different between the two samples. This inter-sample difference in location can give rise to a significant correlation coefficient between the dependent and independent variable in the full sample, which may not exist in each of the sub-samples. Investigations show that this has, in fact, occurred in the present study in relation to capital gearing. Although CAPGEAR is significant in the full sample, when the data is partitioned on the basis of SIRELRAN, the means of both the smoothing index variable and the capital gearing variable are significantly different between the two groups (confirmed at the one per cent level using t-tests of the difference between means). As a result the variable CAPGEAR is no longer significant in the sub-sample.

The lack of significance of the political costs proxy may be attributable to the dearth of utilities in the sample. This results in a low level of variation in the political cost variable, causing a potentially significant relationship to become obscured.

The explanatory power of the model in this study ranges from $23-44$ per cent (based on unadjusted R^2) and $17-34$ per cent (based on adjusted R^2). In their income strategy study based on four accounting method choices, Zmijewski and Hagerman (1981, p. 141) obtain a pseudo R^2 of 9 per cent, using probit analysis. Unfortunately a direct comparison is problematic, since the probit estimated R^2 should not be interpreted in the conventional manner (McKelvey and Zavoina, 1975). The (unadjusted) R^2 of Moses' (1987) OLS model is 21 per cent, although this is artificially inflated by including a directional variable. The proportion of variance explained by our model therefore compares favourably with previous accounting choice studies. This could be attributable to (i) the selection of a powerful instrument of earnings management, (ii) the development of a more precise measure of smoothing than the dichotomous measures normally employed, and (iii) the inclusion of a number of potentially relevant variables which have not previously been tested. In addition, compared to the US, the financial climate and regulatory environment prevailing in the UK at the time of this study may have given managers a greater incentive to manage earnings.

A large proportion of the variance in SI does, however, remain unexplained. We offer two explanations for this. First, we use a number of

proxy variables which may be capturing the effects of variables other than those specified and/or which may fail to capture the effects of those variables which are specified. A particular limitation is the use of capital gearing as a proxy for the agency costs of debt. Second, the model of managerial classificatory choices is undoubtedly incompletely specified. It is possible that managers wish to follow the choice made by the majority of firms (if this is not too costly), in which case their classificatory choice is constrained. External auditors may further limit the range of available choices. Whilst the most influential observations affected by such constraints have been identified and dealt with, future studies of this type should attempt to explicitly incorporate the degree of classificatory discretion into the model. In addition, it must be recognised that tradeoffs exist between income smoothing and income increasing/decreasing earnings management strategies. Failure to incorporate the existence of conflict between these two strategies may be a further source of model misspecification. In exploratory analysis we partitioned the sample into three, based on the existence and nature of such conflict; however, the sub-sample sizes became too small to permit reliable estimation.

CONCLUSIONS

The UK offers a unique financial reporting environment, where classificatory choice is a powerful earnings management instrument. In this study, an incentives model grounded in contracting costs is used to explain managerial classificatory choices in terms of their effect on single-period income smoothing. We find significant positive associations with earnings variability, dividend payout, managerial share options and the diffuseness of share ownership. Our results also indicate that the incentives to smooth are positively related to the magnitude of the effect of classificatory choices, relative to expected earnings, i.e. the effect must reach a certain level before smoothing behaviour is triggered.

The model specified in the present study succeeds in explaining a substantial proportion of the variation in managerial classificatory choices. The study does, however, suffer from a number of limitations which should be addressed by future studies. First, our results indicate that the degree of discretion available to managers in making classificatory choices is an important control variable which should be included in the model specification. Second, conflict between earnings management strategies must impair the power of a model to explain accounting choices in terms of a single strategy. Finally, classificatory choice represents only one (albeit powerful) earnings management instrument. It may be necessary, following Hagerman and Zmijewski (1979), to extend their portfolio approach to incorporate the effect of accounting method choices *in addition to* classificatory choices.
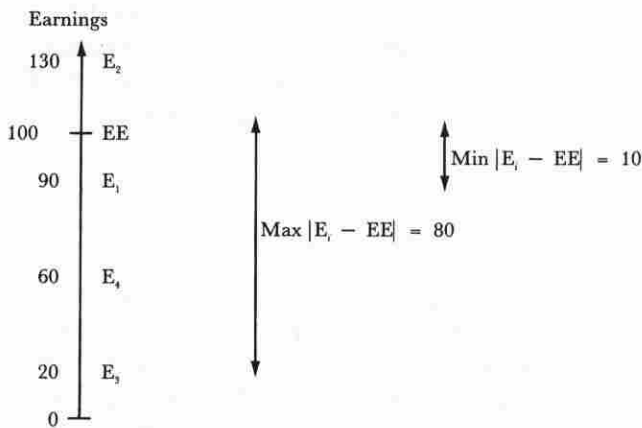
APPENDIX

An Illustration of the Smoothing Index

Assume that a company has two discretionary items to be classified — a credit item of 40 and a debit item of 70. Assume further that the level of earnings before these items are classified is +90. In this situation there are four possible reported earnings figures (E_i), depending on how the two items are classified, *viz.*

$E_1 = 90$ if neither item is classed as exceptional,
$E_2 = (90 + 40) = 130$ if the 40 credit is classed as exceptional,
$E_3 = (90 - 70) = 20$ if the 70 debit is classed as exceptional,
$E_4 = (90 + 40 - 70) = 60$ if both items are classed as exceptional.

Given the level of expected earnings (EE), say +100, the smoothing effect of these alternative classificatory choices can be calculated. We first establish the range of smoothing, shown graphically below:

Earnings

```
130 ┬ E₂


100 ┼ EE                      ▲                    ▲
                              │                    │  Min |Eᵢ − EE| = 10
 90 │ E₁                      │                    ▼

                              │ Max |Eᵢ − EE| = 80

 60 │ E₄                      │


 20 │ E₃                      ▼
    │
  0 ┴
```

therefore, range of smoothing $= \max |E_i - EE| - \min |E_i - EE|$
$= 80 \qquad\qquad - 10$
$= 70.$

The four possible values of the smoothing index are then calculated with reference to this, i.e.

$$SI = \frac{\max |E_i - EE| - |RE - EE|}{\max |E_i - EE| - \min |E_i - EE|},$$

therefore:

if reported earnings (RE) was 20 (E_3), then SI $= \dfrac{80 - 80}{70} = \dfrac{0}{70} = 0,$

if reported earnings (RE) was 90 (E_1), then SI $= \dfrac{80 - 10}{70} = \dfrac{70}{70} = 1,$

if reported earnings (RE) was 60 (E_4), then SI $= \dfrac{80 - 40}{70} = \dfrac{40}{70} = 0.57,$

if reported earnings (RE) was 130 (E_2), then SI $= \dfrac{80 - 30}{70} = \dfrac{50}{70} = 0.71.$

NOTES

1 Most experimental studies support the functional fixation hypothesis, as do a number of recent market-based studies (Tinic, 1990).
2 Since the value of share options is positively associated with variability, theoretically an interaction effect may exist whereby managers *favour* high variability.
3 We experimented with a number of alternative measures for several of these variables. Market risk was measured as the percentage standard deviation of the share returns (total risk), and income gearing was used to measure the agency costs of debt. Political costs were also proxied using market share and capital intensity variables. Capital intensity was measured based on both fixed assets and total physical assets. In addition, in recognition of the fact that rising prices may bias these measures downwards, one minus a measure of labour intensity was also used. Finally, alternative measures of outside ownership control used were the percentage owned by the five largest single outside shareholdings and the percentage of non-executive directors.
4 This is calculated as $(\max E_i - \min E_i)/|EE|$, where EE is based on the simple random walk model.
5 This occurs because the measure of smoothing for each firm is one of a number of discrete outcomes, of which the values zero and one are always potential outcomes.

REFERENCES

Amihud, Y. and B. Lev (1981), 'Risk Reduction as a Managerial Motive for 1982 Conglomerate Mergers', *The Bell Journal of Economics* (Autumn 1981), pp. 605−617.

————, J.H. Kamin and J. Ronen (1983), '"Managerialism", "Ownerism" and Risk', *Journal of Banking and Finance* (June 1983), pp. 189−196.

ASB (1991), *ASB Working Drafts for Discussion* (April 1991).

Barnea, A., J. Ronen and S. Sadan (1976), 'Classificatory Smoothing of Income with Extraordinary Items', *The Accounting Review* (January 1976), pp. 110−122.

Beidleman, C.R. (1973), 'Income Smoothing: The Role of Management', *The Accounting Review* (October 1973), pp. 653−667.

Belkaoui, A. and R.D. Picur (1984), 'The Smoothing of Income Numbers: Some Empirical Evidence on Systematic Differences Between Core and Periphery Industrial Sectors', *Journal of Business Finance & Accounting*, Vol. 11, No. 4 (Winter 1984), pp. 527−545.

Belsley, D., E. Kuh and R. Welsch (1980), *Regression Diagnostics: Identifying Influential Data and Sources of Collinearity* (John Wiley, 1980).

Brayshaw, R.E. and A.E.K. Eldin (1989), 'Smoothing Hypothesis and the Role of Exchange Differences', *Journal of Business Finance & Accounting*, Vol. 16, No. 5 (Winter 1989), pp. 621−633.

Christie, A.A. (1990), 'Aggregation of Test Statistics: An Evaluation of the Evidence on Contracting and Size Hypotheses', *Journal of Accounting and Economics* (January 1990), pp. 15−36.

Copeland, R.M. (1968), 'Income Smoothing', *Journal of Accounting Research* (Supplement 1968), pp. 101−116.

Craig, R. and P. Walsh (1989), 'Adjustments for Extraordinary Items in Smoothing Reported Profits of Listed Australian Companies: Some Empirical Evidence', *Journal of Business Finance & Accounting*, Vol. 16, No. 2 (Spring 1989), pp. 229−245.

Davidson, SD., C. Stickney and R. Weil (1987), *Accounting: The Language of Business*, 7th edition (Thomas Horton and Daughter, 1987).

Dye, R.A. (1988), 'Earnings Management in an Overlapping Generations Model', *Journal of Accounting Research* (Autumn 1988), pp. 195−235.

Financial Reporting Council (1991), *The State of Financial Reporting — A Review* (Financial Reporting Council, 1991).

Givoly, D. and J. Lakonishok (1983), 'Divergences of Earnings Expectations: The Effect on Market Response to Earnings Signals', Working Paper 768/83 (Tel Aviv University, February 1983).

Gordon, M.C. (1964), 'Postulates, Principles and Research in Accounting', *The Accounting Review* (April 1964), pp. 251–263.

Hagerman, R.L. and M.E. Zmijewski (1979), 'Some Economic Determinants of Accounting Policy Choice', *Journal of Accounting and Economics* (August 1979), pp. 141–161.

Holthausen, R.W. (1990), 'Accounting Method Choice: Opportunistic Behavior, Efficient Contracting and Information Perspectives', *Journal of Accounting and Economics* (January 1990), pp. 207–218.

Hunt, H.G. (1986), 'The Separation of Corporate Ownership and Control: Theory, Evidence and Implications', *Journal of Accounting Literature*, Vol. 5 (1986), pp. 85–124.

_____ and R.L. Hogler (1990), 'Corporate Ownership and Accounting Choice: A Critical Analysis', *Critical Perspectives on Accounting*, Vol. 1 (1990), pp. 53–67.

ICAEW (1990), *Financial Reporting 1989–90: A Survey of UK Published Accounts*, D.J. Tonkin and L.C.L. Skerratt (eds.) (ICAEW, 1990).

Kamin, J. (1975), *Income Smoothing with Discretionary Items: The Management of Risk-Return Performance and the Separation of Ownership and Control in Large Industrial Firms* (University Microfilms International, 1975).

_____ and J. Ronen (1978), 'The Smoothing of Income Numbers: Some Empirical Evidence of Systematic Differences Among Management-Controlled and Owner-Controlled Firms', *Accounting, Organizations and Society* (1978), pp. 141–160.

Ma, C.K. (1988), 'Loan Loss Reserves and Income Smoothing: The Experience in the US Banking Industry', *Journal of Business Finance & Accounting*, Vol. 15, No. 4 (Winter 1988), pp. 487–497.

Maddala, G.S. (1977), *Econometrics* (McGraw-Hill, 1977).

Mayer-Sommer, A.P. (1979), 'Understanding and Acceptance of the Efficient Markets Hypothesis and its Accounting Implications', *The Accounting Review* (January 1979), pp. 88–106.

McKelvey, R.D. and W. Zavoina (1975), 'A Statistical Model for the Analysis of Ordinal Level Dependent Variables', *Journal of Mathematical Sociology* (1975), pp. 103–120.

Morck, R., A. Shleifer and R. Vishny (1988), 'Management Ownership and Market Valuation: An Empirical Analysis', *Journal of Financial Economics* (Jan./March 1988), pp. 293–315.

Moses, O.D. (1987), 'Income Smoothing and Incentives: Empirical Tests Using Accounting Changes', *The Accounting Review* (April 1987), pp. 358–377.

Niehaus, G.R. (1989), 'Ownership Structure and Inventory Method Choice', *The Accounting Review* (April 1989), pp. 269–284.

O'Keefe, T.B. and S.Y. Soloman (1985), 'Do Managers Believe the Efficient Market Hypothesis? Additional Evidence', *Accounting and Business Research* (Spring 1985), pp. 67–80.

Ronen, J. and S. Sadan (1981), *Smoothing Income Numbers: Objectives, Means and Implications* (Addison-Wesley, 1981).

Rozeff, M. (1982), 'Growth, Beta and Agency Costs as Determinants of Dividend Payout Ratios', *Journal of Financial Research* (Fall 1982), pp. 249–259.

Schipper, K. (1989), 'Commentary on Earnings Management', *Accounting Horizons* (December 1989), pp. 91–102.

Shapiro, A.C. and S. Titman (1985), 'An Integrated Approach to Corporate Risk Management', *Midland Corporate Finance Journal* (Summer 1985), pp. 41–56.

Smith, E.D. (1976), 'The Effect of the Separation of Ownership from Control on Accounting Policy Decisions', *The Accounting Review* (October 1976), pp. 707–723.

Strong, J.S. and J.R. Meyer (1987), 'Asset Writedowns: Managerial Incentives and Security Returns', *Journal of Finance* (July 1987), pp. 643–663.

Suh, Y.S. (1990), 'Communication and Income Smoothing Through Accounting Method Choice', *Management Science* (June 1990), pp. 704–723.

Sutton, T.G. (1988), 'The Proposed Introduction of Current Cost Accounting in the UK: Determinants of Corporate Preference', *Journal of Accounting and Economics*, pp. 127–149.

Tabachnick, B.G. and L.S. Fidell (1983), *Using Multivariate Statistics* (Harper and Row, 1983).

Tinic, S.M. (1990), 'A Perspective on the Stock Market's Fixation on Accounting Numbers', *The Accounting Review* (October 1990), pp. 781–796.

Trueman, B. and S. Titman (1988), 'An Explanation for Accounting Income Smoothing', *Journal of Accounting Research* (Supplement 1988), pp. 127–139.

Walsh, P., R. Craig and F. Clarke (1991), '"Big Bath Accounting" Using Extraordinary Items Adjustments: Australian Empirical Evidence', *Journal of Business Finance & Accounting*, Vol. 18, No. 2 (January 1991), pp. 173 – 189.

Watts, R.L. and J.L. Zimmerman (1990), 'Positive Accounting Theory: A Ten Year Perspective', *The Accounting Review* (January 1990), pp. 131 – 154.

_____ _____ (1986), *Positive Accounting Theory* (Prentice Hall, 1986).

White, H. (1980), 'A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity', *Econometrica* (May 1980), pp. 817 – 838.

Zmijewski, M.E. and R.L. Hagerman (1981), 'An Income Strategy Approach to the Positive Theory of Accounting Standard Setting/Choice', *Journal of Accounting and Economics* (August 1981), pp. 129 – 149.